

SUMMARY REPORT OF THE OCTOBER 28, 1988

UNOLS ANNUAL MEETING
AMERICAN INSTITUTE OF ARCHITECTS
1735 New York Avenue NW
Washington, DC

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Summary Report of the UNOLS Annual Meeting

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**Summary Report of UNOLS Annual Meeting
October 28, 1988**

**American Institute of Architects
1735 New York Avenue NW
Washington, D.C.**

General: Issues and items are reported in the order in which they were addressed at the October, 1988 UNOLS Annual Meeting. Exceptions to the order in the published agenda (Appendix I) are noted.

A list of registered attendees has been compiled from forms submitted at the meeting (Appendix II). Information made available from the UNOLS Office included: **UNOLS Directory, UNOLS Fleet Ship Scheduling Contacts, UNOLS Fleet Marine Operations Contacts and Summary of UNOLS Research Vessel Fleet Operations - 1987 (Appendices III - VI).**

Introduction and Welcome: UNOLS Chair George Keller called the meeting to order, welcomed attendees and presented the agenda. Before addressing the first agenda item, Dr. Keller took a moment in memory of John McMillan.

John Mcmillan was Manager, Ship Operations Program in the Oceanographic Facilities and Support Section of the National Science Foundation's Ocean Sciences Division from 1980 until his untimely death in June, 1988. John came to NSF after graduation from the U.S. Naval Academy in 1958 and his career as an officer in the Navy. He was a warm personal friend of many throughout UNOLS and a respected and valued colleague. Perhaps John was best known for his effectiveness and dedication. He showed us how to be constructive and helpful. **UNOLS commends John McMillan for his contributions to academic oceanography and extends its sympathy and best wishes to his family.**

Report from UNOLS Chair: George Keller began his report by stating that during 1987-1988 UNOLS had extraordinary opportunity to provide counsel, advice and recommendations to federal agencies on issues in programs for oceanographic research and facilities support.

Significant UNOLS actions and activities during the past year included: Standing UNOLS committees continued as foci for UNOLS activity. Reports from Chairs of the Advisory Council and each of the four committees are included on the agenda and, effectively, are part of the UNOLS Report for 1988.

Early in 1987, the Fleet Replacement Committee, having completed their Plan for Improved Capability of the University Oceanographic Research Fleet - 1986, was disbanded and reconstituted as the Fleet Improvement Committee (FIC). The FIC has been very active over the last year, especially in specifying fleet improvement needs and in providing information and advice to federal agencies.

The UNOLS community continued their enthusiastic interest in SWATH designs for research vessels. That interest notwithstanding, UNOLS recommended against proceeding with a NavSea design for a large SWATH R/V for the UNOLS fleet. Both the Advisory Council and the FIC had assessed the developing SWATH design and concluded that the ship was ill-suited to university ocean research and would be too expensive to operate within the UNOLS fleet. The UNOLS Chair made such a recommendation through the Office of Naval Research. Each of the eighteen UNOLS member institutions supported the Chair's recommendation against the SWATH design. Later, NavSea stopped work on the design, perhaps in part due to the effective, unanimous response from UNOLS and UNOLS Members.

More constructively, the contract has been let for design and construction of AGOR-23 by Halter Marine. UNOLS provided valuable advice and information to ONR and NavSea in preparation of the Circular of Requirements (specifications) for the vessel. Those activities have largely passed to the University of Washington since their selection as operator for the AGOR-23.

NSF's Division of Polar Programs asked UNOLS to assess specifications supporting a Request for Proposals on their Research Vessel with Ice-Breaking Capability (RVIB). UNOLS and FIC responded with comments but noted that the timeframe for comments was too short to allow a truly comprehensive review.

Security assessments, plans and training were provided to fifteen UNOLS ships under a contract let through the UNOLS Office. The program addressed anti-terrorism as well as general security.

Medical advisory service was available to all UNOLS ships through another UNOLS Office contract. The service is used by most UNOLS ships that sometimes operate on remote deployments. Ships employed exclusively on local work rarely use the service.

The Research Vessel Operators Council (RVOC) continued to address most marine operations issues before UNOLS. At UNOLS' request, the RVOC developed and recommended a set of criteria to govern the selection of ships for lay-up and advancing a schedule for selecting ships that would allow appropriate savings and useful maintenance. Comments on the RVOC white paper revealed the complexity of the lay-up issue and suggested that it will take a lot of work to make this or any other scheme work. Nevertheless, some parts of the RVOC recommendations are being used, and there is a clear need for rules to use in identifying candidates for ship lay-up.

The ALVIN Review Committee continued their roles of recommending projects for scheduling on ALVIN/ATLANTIS II and oversight over ALVIN operations. The ALVIN-supported program remains strong although there are some problems. ALVIN use in 1989 will be extraordinarily low, due in part to ALVIN overhaul early in the

year, lower than ordinary demand, especially in the Atlantic and non-ALVIN demand for ATLANTIS II. ALVIN/ATLANTIS II will have had one of their most productive years ever in 1988.

Ship scheduling remains one of the most compelling issues before UNOLS. Ship Scheduling Groups were especially taxed in 1988 because of restricted 1989 funds to support both ship operations and science programs (ship use demand). The Scheduling Groups were able to coordinate development of a fleet schedule fitting within available funding and employing all ships except those non-operational because of retirement, extensive renovation, refit or other external factors. Improvement of scheduling efficiency and fleet effectiveness remain the paramount issues to UNOLS and the Ship Scheduling Groups.

Representatives from NSF and ONR had just announced completion of a Memorandum of Agreement on Joint Research Ship Policy for the two agencies (Appendix VII). UNOLS commends NSF and ONR staffs for their hard work in developing this policy, and expects that it will provide solutions for many ship scheduling and operational problems.

UNOLS, along with many segments of the oceanographic community, had followed closely and provided comments as Minerals Management Service had developed their Prospecting Regulations for Minerals other than Oil, Gas and Sulphur. There was concern that the rules would impose onerous permit requirements on any scientific research conducted on the Outer Continental Shelf (OCS). Community actions had some effect, and when final rules were published, most scientific research did not require notice or permit application to MMS. (See UNOLS News, v.5, n.2, September, 1988 for further information.)

UNOLS also commented on Coast Guard-proposed rules on a Program for Chemical Drug and Alcohol Testing of Commercial Vessel and Personnel. In a letter to the Marine Safety Council, U.S. Coast Guard (distributed to UNOLS institutions), the UNOLS Chair asked for clarifications of the proposed rules as they might pertain to research vessels in the UNOLS fleet. There were concerns on whether the rules would clearly cover research vessels, on the assignment of responsibilities-to-enforce onto marine employers and on applicability to personnel other than crew.

At NSF, Ocean Sciences Division's request, UNOLS formed a committee to review two proposals: from Lamont-Doherty Geological Observatory to acquire the BERNIER as a replacement vessel for the CONRAD and from the University of Texas, Austin and Texas A&M University for an MCS center managed around leasing commercial MCS vessels. The UNOLS group recommended against both proposals. (A special NSF panel was also negative.) LDGO thereafter submitted a modified proposal for acquisition of the BERNIER; it was favorably reviewed by both a second UNOLS group and NSF panel.

UNOLS was pleased for the opportunity to review the proposals but is concerned at the very short time allowed, especially for the

second LDGO proposal. It is difficult to arrange for competent review on such short notice. The review situation pointed out again the need for better planning. UNOLS would especially like to see an NSF ship construction/acquisition plan.

The UNOLS Charter had been redrafted and a proposed revision placed before the membership for adoption. The UNOLS Chair had, at the October, 1987 UNOLS Annual Meeting, been directed to revise the Charter. The Chair urged UNOLS members to adopt the proposed revision which presents a more streamlined and effective organization. This will help UNOLS better to address constituent needs and requirements and to set priorities among conflicting needs.

In summary Dr. Keller noted that UNOLS had been effective in a busy year. As has come to be expected, UNOLS activity has been centered among the Advisory Council and standing committees - ALVIN Review, Ship Scheduling, Fleet Improvement and RVOC. He thanked the committees and their Chairs for their effective work.

Advisory Council Report: Arthur Maxwell, Advisory Council Chair, reported that the Council had held three meetings during 1988:

- at Harbor Branch Oceanographic Institution in March,
- at Woods Hole Oceanographic Institution in July, and
- in Washington, D.C. on October 26.

Much of the Council's attention during 1988 was centered on an assessment of the UNOLS fleet and ship requirements over the next three years. In response to requests from NSF and ONR, a subcommittee (Robert Knox, Chair, with Bob Dinsmore and Tom Johnson) examined the fleet together with anticipated ship needs and presented their findings in Short-term Fleet Needs and Management, Report and Recommendations, 8/10/88. The Advisory Council endorsed the report, to be found in the Advisory Council Meeting Report, October 26, 1988. Findings in the report are bleak. Comparison of anticipated funding for operations and full operation of the fleet suggests deficits of from \$4.1 million to \$8.0 million in 1989, from \$2.0 million to \$3.8 million in 1990, and as much as \$7.3 million in 1991. It should be noted that both available funding and fleet operational costs are moving targets; 1989 estimates from the October 27 Ship Scheduling meeting forecast a near balance between available funding and fleet operations costs. Nevertheless, anticipated funding strictures compared with expected fleet costs paint a perilous picture.

Recommendations in the report are:

1. Identify 1989 lay-ups early, based on soft schedules and needs and plans for useful refits. Retirements should be based on individual ship's material condition, costs and effectiveness.

2. Begin advanced planning on lay-ups and retirements in 1990 and 1991, based on the same criteria.
3. Examine skeptically the need for new ships and tie them to retirement of equal or greater numbers.
4. Scientific programs will have to adjust to the fleet capacity that can be supported.

These sobering recommendations were delivered within a context that both scientific programs and facility operations in oceanographic research deserve and could effectively use more funding support and that the agencies should urgently seek a substantial increment of ship operations funds, and should coordinate this with appropriate support of well-reviewed sea-going research proposals.

The Council formed a group led by Tom Malone to devise a policy for the use of radioactive substances aboard UNOLS ships. The group is comprised mainly of radiation safety officers from various UNOLS institutions. Preliminary findings are that there is little consistency in the permits held by various institutions and that there is need for "uniform minimum standards" for UNOLS institutions and ships. Policy recommendations to UNOLS should be presented during 1989.

ONR has requested that the Advisory Council determine oceanographic community needs for laboratory grade at sea facilities and preliminary concepts of the nature of such facilities. A group led by Robert Knox has just begun this effort.

The Council is also contacting University of Delaware officials about interfacing UNOLS ship scheduling with OCEANIC ship scheduling information, thus providing a more useful data base of ship operations information.

The Advisory Council considered two applications packages, and recommends:

- the Monterey Bay Aquarium Research Institute (MBARI) be made an Associate Member in UNOLS, and
- the Louisiana Universities Marine Consortium (LUMCON) be made a Member in UNOLS and their R/V PELICAN be designated a UNOLS vessel.

These recommendations on membership will be presented to UNOLS later in the meeting.

The Advisory Council Chair was a part of the group drafting the proposed revision of the UNOLS Charter. The Advisory Council has carefully reviewed the proposed revision and strongly recommends that UNOLS accept it. One sense of the revision is to shift UNOLS more toward a research vessel users organization while still maintaining strong interest in ship operations and scheduling. The

Council believes that this shift, together with an institutional/structural streamlining, will make UNOLS more effective.

Fleet Improvement Committee: Worth Nowlin, Chair, FIC, reported on the Committee's extensive activities during 1987-1988. (An outline for the FIC report is Appendix VIII.)

FIC objectives are:

- Amplify and update the UNOLS Fleet Improvement Plan
- Refine scientific mission requirements
- Concept designs
- Alternatives to new construction:
 - Refits and improvements to existing UNOLS ships
 - Conversion of other available ships
- Carry selected concept designs to more detailed design phase
- Liaison and information source to federal agencies

Specific FIC activities during 1987-1988 were a continuing review of federal agency ship acquisition plans and responses to requests for advice (including a detailed review of NavSea SWATH plans and negative recommendations); initiation of preliminary design for a large, general purpose monohull (the Glosten Associates/Scripps concept); concept design for an intermediate SWATH (by SEACO); inspection and evaluation for conversion of a group of surplus MARAD vessels; and refinement and further development of scientific mission requirements (small general purpose, intermediate SWATH and MCS-capable ships now covered; work has begun for small to intermediate ice-capable vessels for the Arctic, for a stable deep ocean platform and for a research submarine).

Special studies were made on the need for ice-breaking and ice-capable ships for the Arctic, on potential improvements and refit needs of existing intermediate ships and on the history of the U.S. oceanographic fleet.

The FIC issued several reports: Arctic Science Requirements for Ice-Worthy Research Vessels, Scientific Requirements for the UNOLS Fleet, SEACO Concept Design for a General Purpose SWATH Oceanographic Research Ship, History of the U.S. Academic Oceanographic Research Fleet and the Sources of Research Ships, and Scientific Mission Requirements for Oceanographic Research Vessels.

In 1989 the FIC plans:

- a concept design for a two-strut intermediate SWATH research ship,

- studies to define possible improvements to existing Cape class vessels,
- scientific mission requirements for complete range of vessels,
- a concept design for a small SWATH research vessel,
- a concept design for an improved FLIP, and
- the revised Fleet Improvement Plan.

FIC will continue to be responsive to UNOLS and agency requests for information and recommendations.

ALVIN Review Committee: Feenan Jennings, ARC Chair, reported that the Committee had held its annual review of requests for ALVIN dives (and ATLANTIS II time) on June 20-22, 1988.

The ARC reviewed non-diving requests for time on ATLANTIS II as well as dive requests, both U.S. and foreign, for ALVIN/ATLANTIS II.

Membership on the ALVIN Review Committee is:

Feenan Jennings	Mary Scranton
James Eckman	Geoff Thompson
J.C. Casey Moore*	Georges Weatherly
Doug Nelson	George Grice, ex-officio
W.F.B. Ryan	

*unable to participate in June 1988 review
(Jeff Fox substituted.)

The ARC had received a request for ATLANTIS II shiptime to support the Joint Global Ocean Flux Study (JGOFS)/U.S. Global Ocean Flux Study (GOFS) during 1989. NSF representatives had requested that ARC review this non-ALVIN use of ATLANTIS II and make recommendations along with their 1989 ALVIN/ATLANTIS II schedule recommendations. The JGOFS/GOFS request was for the period of March through June. ALVIN was to be undergoing major overhaul during much of that time. The ARC agreed to review the request along with dive requests for ALVIN/ATLANTIS II time.

The Committee also received ALVIN Dive Requests from non-U.S. investigators. These requests were submitted as part of an overall request for a project on the mid-Atlantic Ridge. Sponsoring agencies asked the ARC to make policy recommendations concerning foreign requests for ALVIN use. The ARC agreed; their policy recommendations are APPENDIX IX.

The ARC reviewed 23 ALVIN/ATLANTIS II Time Requests for a total of 249 dives. (Three of these requests, for a total of 14 dives were for 1988.) The Committee recommended twelve requests for 74 dives

in 1989 and 14 in 1988. One request from a foreign investigator was among those recommended. The ARC also recommended that ATLANTIS II be used for the (non-ALVIN) GOFs work during March-June, 1989.

A tentative schedule was developed by WHOI operators that would have had ATLANTIS II on GOFs in the north Atlantic during March-June, ALVIN/ATLANTIS II operations on the mid-Atlantic Ridge in August-September, ATLANTIS II overhaul, transect to the Pacific and probably one project on the EPR by year's end. Subsequently, additional non-ALVIN need for ATLANTIS II developed in the north Atlantic, and Pacific projects were deferred.

The ARC endorsed an ALVIN 25th Anniversary Symposium, to be organized and conducted by WHOI in late 1989. In addition to its scientific value, the Symposium would be of help to the ARC in assessing trends in research using deep submersibles and in planning for future ALVIN programs.

The Committee heard a WHOI report that ALVIN data and information are very poorly archived. There is need for a system with automated data search and recovery; much of the early ALVIN data and information are on film, and the film is deteriorating. The ALVIN Review Committee recommended that WHOI develop for ALVIN records an appropriate cataloging/archiving system with provisions for rapid random access search and retrieval. They further recommended that the historical record be assessed for selective reproduction (to prevent loss of important data and information).

Two ARC members, William F.B. Ryan and Georges Weatherly, had terms expiring. Both requested that they not be considered for re-appointment, in their belief that turnover in ARC membership is healthy. The ARC recommended as new members David Cacchione, USGS, Menlo Park and Paul J. Fox, University of Rhode Island. The UNOLS Membership endorsed the ARC recommendations and appointed David Cacchione and Paul J. Fox each to three-year terms on the ALVIN Review Committee.

Bruce Robison, study leader, reported on the UNOLS-commissioned Submersible Science Study - the 1990s. Study group members are:

Bruce Robison, MBARI Chair	Dan Fornari, L-DGO
Bob Aller, SUNY Stony Brook	Bob Wall, U. Maine
Dick Cooper, U. Connecticut	Karen Wishner, URI
Joe Curray, Scripps	Dana Yoerger, WHOI

The objectives of this long-range planning study are:

- to assess trends, patterns and directions for academically-based ocean science research programs that require manned or unmanned submersible systems, and
- to develop a comprehensive submersible science facilities plan which satisfies the projected science requirements.

Requirements for submersible systems by funded investigators will continue and grow through the 1990's. By mid-decade this annual demand will include:

- continued full use of ALVIN,
- 100 or more days of 6,000 meter vehicle time (increasing to a full year by 2000),
- 850 days on 1,000 meter manned vehicles,
- 600 days for 2,000-3,000 meter general purpose unmanned ROVs, and
- 1,000-1,500 days for small, shallow, low-cost ROVs.

These requirements, for funded research, will be spread among the major agencies for funding ocean science research and will encompass all disciplines albeit with emphasis on biology and geology.

Study recommendations are in three groups:

1. **Improvements to the ALVIN program.** Although the ALVIN program earns excellent marks for its safe and effective research support, some improvements are recommended so that the program will stay at the same high level, especially as they integrate new technologies into ALVIN operations. The study recommends that the sea-going and shore-based ALVIN support groups be expanded and that ATLANTIS II SEABEAM as well as ALVIN bottom navigation and data acquisition systems be made more effective.
2. **Gaining access to depths beyond 4,000 meters.** The study group recommends that an aggressive effort be made to provide to the academic research community access to depths greater than 4,000 meters. This would include for U.S. researchers straightforward and improved means for using the Navy's SEA CLIFF, and a workable process for gaining access to the French NAUTILE, the Russian MIR I and MIR II and Japan's SHINKAI 6500. These two measures could provide U.S. research access to as much as 95% of the ocean floor while either a manned or unmanned capability to greater than 6,000 meters is developed for use by the U.S.'s civil oceanographic research interests.
3. **Provide shallow depth vehicles on a scale to meet demand.** The study group recommends that both manned and unmanned shallow depth systems be leased through structures similar to NOAA's National Undersea Research Program (NURP) and centers. Both ONR and NSF should provide similar access, and the current regional structure should be expanded to cover all of the U.S.

The study also recommends that UNOLS establish a Submersible Science Committee (SSC) (analogous to the ALVIN Review Committee)

to facilitate the integration of the full range of manned and unmanned submersibles into the academic oceanographic research community. This SSC would exercise oversight and coordinate over the access process and operations of the full range of research submersible facilities.

Chairman Keller introduced the principal speaker, Dr. William E. Evans, Undersecretary of Commerce for Oceans and Atmosphere, and Administrator, National Oceanic and Atmospheric Administration.

Undersecretary Evans informally outlined his agenda for NOAA and cited recent examples illustrating his approach.

As NOAA Administrator he has made substantive efforts to "put the 'O' for Oceanography" back into NOAA and to make NOAA a more unified agency.

Although NOAA was established as a science and services agency focused on the oceans and atmosphere, it was given regulatory responsibilities in 1973 and these were reinforced in 1976. NOAA regulatory responsibilities deal with coastal zone land management, protection of marine mammals, control of foreign and domestic fisheries in the contiguous fisheries management zone, marine sanctuaries, marine mining and stewardship of the marine environment.

Recent NOAA efforts to rescue three grey whales trapped in sea ice near Barrow, Alaska received wide publicity. The NOAA effort was mainly one of coordination; most direct expenses to the effort were by other (private) groups. The NOAA effort was used as an opportunity to integrate diverse agency capabilities and services to address in real time a common problem (e.g. real time weather and ice information, charts, marine environmental information and knowledge).

Common UNOLS-NOAA research interests include:

- Global scientific climate system,
- Long-term global climate change (e.g. decertification, changes to major ice sheets),
- Prediction and assessment of atmospheric and marine environment, and
- Forecasts and understanding of fisheries and habitats.

The Administrator believes that, since the 1976 intensification of regulatory responsibilities, NOAA research and environmental services programs have not been fully focused. Although NOAA will strive to avoid panic responses, strong efforts are pushed in Coastal Ocean Quality and Global Climate Change.

NOAA has advanced for FY-1990 a \$35 million Coastal Ocean Quality Initiative that will address NOS, NMFS and OAR problems and responsibilities. The agency is participating in cooperation with NSF and others in Global Climate Change programs including WOCE, TOGA, VENTS, GOFS and STACKS.

The NOAA fleet has been evaluated recently, in light of the changing NOAA mission. Findings are sobering. The fleet does not fit the mission. It includes too many ships specializing in hydrography for nautical charting and is not adequate to support research and fisheries missions. Ice-capable ships are needed for polar work. (The National Security Council has recently asked NOAA for information on ice-capable ships.) The fleet cannot support NOAA fisheries management responsibilities in the U.S. EEZ, which provides 15% of the world's fish catch. (Note that fish trade is one of the few areas where the U.S. is maintaining and increasing a favorable trade balance.) The Administrator announced that the ship SURVEYOR would be deployed to Antarctica for several months during 1988-1989 on fisheries research.

The NOAA fleet is block funded, although funds have in recent years not been sufficient to operate the entire fleet; four ships were laid up in 1988, and two more will be in 1989. Because of budget strictures and the mismatch between ships and needs, NOAA will:

- Manage the NOAA fleet as a national resource; ships not assigned to agency program needs can be assigned to universities if there is a need. (NOAA will also consider chartering UNOLS ships if there is need.)
- Establish an office of NOAA Operations and NOAA Corps to be responsible for all ships aircraft and the NOAA Corps.

The Undersecretary's address was warmly received. In response to questions, Dr. Evans said that the Coastal Ocean Quality Initiative would have direct links to SEA GRANT programs and infrastructure. He discussed the SEABEAM classification issue, noting that NOAA supports and is working for free use of data, originating both from NOAA and academic programs. However, any decision to declassify is in the hands of the Department of Defense and the National Security Council. Strident protests would likely be counterproductive.

Jack Bash, Chairman, reported on the successful RVOC meeting of October 4-6, 1988 in Seattle.

The RVOC accepted the Communications Guide for UNOLS ships and operating institutions, prepared by Ken Palfrey, Marine Superintendent at Oregon State University. The Guide has been distributed through the UNOLS Office and is proving very useful.

RVOC considered and accepted the proposed UNOLS Charter revision presented by the UNOLS Chair. RVOC had reservations about proposed changes in their method of selecting officers and in changing "Council" to "Committee" in their name. They were more

enthusiastic about clarification of RVOC roles and functions in UNOLS and RVOC representation on the UNOLS Council.

The UNOLS subcontract to provide medical advisory services to the fleet was reviewed. RVOC recommended that a contract for medical advisory services be continued but that associated special studies on occupational health aspects of the UNOLS fleet and medical risk studies are not necessary.

The Council discussed clearances for research in foreign waters and the clearance application process. They were sympathetic to the plight of Tom Cocke and the Office of Marine Science, Department of State (increased applications load, increasingly stringent conditions on clearances) and advocated as much support to that office as could reasonably be provided. They also heard from Lee Stevens on his concept of an office to aid in preparing and expediting submission of clearance applications. The RVOC endorsed this concept. Operators welcome any help on the foreign clearance process.

Risk management and associated questions (e.g., conditions on institutional liability and means for reducing liability) remained a central issue in UNOLS marine operations. The UNOLS Safety Standards are being revised and will be submitted for UNOLS consideration during 1989.

RVOC agreed that they should prepare Safety Manuals and other training aids covering safety in operations ashore and for both crew and scientific parties aboard ships.

The Council discussed with concern the issues of drugs and alcohol aboard ships and policy implications of recent regulatory developments (i.e., the zero tolerance policy, Coast Guard regulations on intoxicants aboard vessels and pending regulations on drug testing). The primary concern of operators is to foster safe conditions for marine operations, but at the same time they recognize the need to develop UNOLS or institution policies that conform to regulatory practices and maintain the seaworthiness of their vessels.

The RVOC discussed the lay-up letter which they had developed. RVOC recognized some of the problems and questions raised by the letter. RVOC consensus was that they would be willing to work to adjust aspects of their recommendations but that some elements such as the need for funds to conduct planned overhauls were essential to the recommended plan.

RVOC noted that legislation had recently passed implementing for U.S. ships requirements of the MARPOL Convention, Annex V, on prevention of pollution by garbage from ships which prohibits the disposal of plastics into the sea. All operators were advised to take steps to comply.

RVOC elected Jim Williams, Marine Superintendent, Scripps, as their new Chair, and Bruce Cornwall, Marine Superintendent, Chesapeake Bay Institute/John Hopkins University as new Vice Chair/Secretary.

George Shor, on behalf of himself and co-Chair Mike Rawson, reported on the ship scheduling meeting of October 27, 1988 and the outlook for ship use in 1989. The complete East Coast and West Coast Ship Scheduling Group Joint Meeting, October 27, 1988 is Appendix X.

The scheduling meeting was successful in that the total cost of 1989 operations proposed by UNOLS operators was an approximate match with the estimates of funds available from NSF, ONR and other sources. This is in contrast with projections of July, 1988 wherein there was a \$2.8 million shortfall for the proposed NSF programs.

That match was reached painfully, however, as a consequence of low science demand for ship time. For whatever reason, science funded for 1989 required only 4,207 ship days, compared to 4,731 in 1988 and a 1983-1987 average of 4,598 days. A comparison between 1989 and 1988:

	1988	1989	Percent Change
Total Days	4,731	4,207	(11)
Total Costs	\$39.01M	\$32.65M	(16)
Daily Rate	\$8,245	\$7,762	(6)

Much of the 1988-1989 reduction is due to fewer days on large ships. Total days are down 49% and costs are down 37% from \$21.40M to \$13.38M. (The THOMPSON is retired, CONRAD, KNORR and MELVILLE will be out of service for much of the year and ATLANTIS II is not fully used.)

For intermediate ships, days have increased by less than 1% and total costs are up 8%.

The use of small (Class IV) ships has increased by 11% and costs have risen by 7%.

Ships smaller than Class IV show use increase by 42% at an increase in costs of 26%.

During the meeting, L-DGO representatives agreed to return the CONRAD to home port in early Spring, 1989 after completing about three months of committed work. Thus it was not necessary for scheduling Chairs to make any recommendations concerning layups.

Ship scheduling meetings have tentatively been set for late June to early July and late September to early October for 1989. The

schedule is mainly directed by the dates of NSF science panels and the target date for Ship Operations Proposals.

Reports from Federal Agencies: Don Heinrichs, NSF/OCE began by summarizing recent staff changes:

- Grant Gross is on sabbatical;
- Don Heinrichs is Director, Ocean Sciences Division;
- Bruce Malfait is Acting Head, OCFS, and continues as Head, ODP;
- Larry Clark, is Acting Ship Operations Manager and continues to head Oceanographic Technology;
- Dick West is Oceanographic Facilities Manager;
- Lisa Lynch is Facilities Support Specialist, devoted mainly to ship operations.

The announcement for the Ship Operations Manager position had closed recently and a selection was expected by year's end.

NSF had, during the year, made a number of requests to UNOLS for evaluations and recommendations (e.g., concerning acquisition of BERNIER, fleet scheduling). NSF appreciates the timely response.

The NSF/OCE budget for FY-1989 was re-capped in a series of slides reproduced below.

NSF BUDGET ESTIMATES
September 1988
(Millions of Dollars)

	1986	1987	1988	1989*
OCEAN SCIENCES DIVISION	119.5	133.7	135.3	146.5
Oceanographic Facilities Detail				
Operations				
Ship Operations	24.0	26.0	25.8	
ALVIN, Aircraft	1.6	1.8	1.8	
Marine Techs	2.5	3.1	3.1	
	<u>28.1</u>	<u>30.9</u>	<u>30.7</u>	<u>32.1</u>
Acquisition & Development				
Science Instrumentation	1.6	1.8	1.6	
Shipboard Equipment	1.4	1.7	1.5	6.7
Technology Development	1.7	2.4	2.6	
AMS Center	--	--	--	1.8
UNOLS, Ship Const.,	0.9	0.4	0.8	0.7
Misc.	<u>\$5.6</u>	<u>6.3</u>	<u>6.5</u>	<u>9.2</u>
TOTAL (OFS)	\$33.7	37.2	37.2	41.3
*1989 Request and Appropriation				

NSF
OCEAN SCIENCES DIVISION
(Millions of Dollars)

	1987	1988	1989*
OSRS	66.56	67.42	73.11
OCFS	37.18	37.26	41.31
ODP	30.00	30.70	32.10
TOTAL	<u>133.74</u>	<u>135.38</u>	<u>146.52</u>
Percent Increase		--8.2%--	

- Global Geosciences Increment
 - Accelerator Mass Spectrometry Facility
 - Start Biotechnology
 - Double Undergraduate Activities
 - Consider Innovative Ways to (acquire) New R/Vs
 - Ocean Engineering/Technology
- *Request & Appropriation**

NSF
ESTIMATED SHIP OPS FY1989
(Millions of Dollars)

	FY88	FY89
OFS, OPS	\$25.8	\$26.5
Ship Ops from ODP	<u>+1.3</u>	<u>+1.5</u>
	27.1	28.0
FY89 funds used last qtr CY88	<u>+4.0</u>	<u>-4.0</u>
TOTAL AVAILABLE	\$31.1	\$24.0*

*Provides (full) Deficit Cancellation.

Dr. Heinrichs noted that Ocean Sciences funds in FY-1989 were protected by Congressional appropriations language. Although there is apparent advantage to OCE in such protection, NSF management would prefer generally that their appropriations included no such language.

Emphasis in Ocean Sciences:

- Global Geosciences, including TOGA and WOCE observing programs, GOFS field operations, initiation of RIDGE long-term observatories and technology for WOCE and GOFS.
- The Accelerator Mass Spectrometry Facility will be established.
- A Biotechnology program will be initiated.
- Ocean Engineering/Technology, Arctic Regions Research and support to Ocean Drilling will be implemented.

Eric Hartwig, Ocean Sciences Director, ONR, began by citing the NSF-ONR memorandum of agreement on Joint Research Ship Policy signed October 17, 1988 by Robert Corell and F.E. Saalfeld.

ONR/Ocean Sciences personnel involved with UNOLS include Steven Ramberg, Director, Ocean Engineering Division, Keith Kaulum, Research Facilities and Ed Mortimer, on-ship construction and modifications (AGOR-23, KNORR, MELVILLE).

Dr. Hartwig's report to UNOLS followed a draft ONR Ship Policy. The objectives of the policy are "to increase ONR funding of at-sea ship operations in support of oceanographic research, and modernize/build research vessels for the oceanographic community."

Accomplishments cited:

- the NSF/ONR Memorandum of Agreement on the research fleet,

- the contract was let and construction was begun on AGOR-23,
- funds were acquired to increase the budget for ship operations,
- new money was made available to overhaul and refit KNORR and MELVILLE, and
- funds for a second large research vessel, similar to AGOR-23, were in the FY-90 budget.

The effect of new funds to increase ship operations was more successful in FY-88 than in FY-89. For 1989, relatively few science projects requiring ship time were funded. ONR will continue their policy, however, in the conviction that ONR-sponsored programs "need more at-sea research."

In light of the rising costs for at-sea research, ONR (along with NSF, NASA and others) intends to promote collaborative research efforts during ONR-sponsored cruises. ONR will encourage their P.I.'s/Chief Scientists to arrange for collaborated appropriate research efforts by other scientists (sponsored by other agencies).

ONR ship acquisition plans would continue as-is unless there develops increased lay-ups involving large Navy ships. If acquisition of the BERNIER reduces the demand for large Navy ships, the AGOR-24 may be impacted. ONR's current strategy is to acquire an AGOR-24 patterned after AGOR-23.

A substantial role was gained for the University of Washington, operating institution for AGOR-23, for evaluating bids and design and currently, monitoring design acceptance and construction. Some progress has been made in gaining acceptance to the changes in arrangements, etc., generated by UW/ONR.

No substantial budget increase is foreseen for ONR's ocean sciences. Funds may be re-oriented within a fixed total. Although DOD, including ONR, have no initiatives directly related to Global Change Programs, there is interest and some relevant activity.

Tom Forhan, NSF/DPP reported that the Division's procurement actions for a research vessel with ice-breaking capability (RVIB) have been developed. Congressional language to NSF has directed that an RVIB should be built in a U.S. shipyard. This so changed conditions that DPP's earlier procurement process had been cancelled and a new request for proposals was being prepared. DPP hoped to present the plan to the National Science Board in December. Funding of \$165 million is available for a 10-year lease. The Division hopes for a construction award in about September, 1989 so that the RVIB could go on line late in 1991.

Election of UNOLS Officers. Terms for the UNOLS Chair, UNOLS Vice Chair and two members of the Advisory Council had expired. A slate of candidates had been circulated to UNOLS members (Appendix XI). Results of the elections:

UNOLS Chair : George H. Keller, Oregon State University

UNOLS Vice-Chair: Tom Johnson, Duke University Marine Laboratory

Election of Tom Johnson as Vice-Chair created a second vacancy for Advisory Council-Member Representation. There were no nominations placed in addition to these in the Slate so two Member representatives for the Advisory Council were elected:

Gary Brass - University of Maine, RSMAS

Jeff Fox - University of Rhode Island

For Advisory Council - Associate Member Representative:

Larry Atkinson - Old Dominion University

Proposed Revision of UNOLS Charter. At the UNOLS Annual Meeting in 1987, UNOLS Members had decided that the UNOLS Charter should be modified and had directed the Chair to draft a revision. The Chair, with help from the UNOLS Executive Committee (Art Maxwell and Bill Barbee) and Brian Lewis, University of Washington, had developed a draft and presented it to the Advisory Council. After the revision was endorsed by the Advisory Council, it was distributed to UNOLS Members with request for comment and an alert that the revision would be submitted for adoption at the 1988 UNOLS meeting.

George Keller, UNOLS Chair, in presenting the Revised UNOLS Charter, urged that it be "adopted in principle" as presented, so that UNOLS could begin immediately to function under the new Charter. He noted that a few relatively minor reservations to the draft had been expressed by interested members:

- . Requirement that the UNOLS Chair consult with the Council on appointments to committees,
- . Clarification on membership on the UNOLS Council,
- . Requirement that permanent committees be established by vote of UNOLS Members, then formed by the UNOLS Chair, in consultation with the Council.

During discussion, some Members expressed concern that efforts to maintain geographic and disciplinary balance on UNOLS Council and Committees should be explicitly called out in the Charter. Other concerns were on UNOLS' role in fostering (read lobby) ocean science research and facilities, and in the designation of UNOLS

vessels. Response to these concerns was that the new Charter used the same language as the old on all those points and no change in policy or practice was intended.

The UNOLS Membership accepted the Proposed UNOLS Charter in principle.

Chairman Keller informed the membership that he would begin immediately to operate under terms of the new UNOLS Charter. Changes appropriate to the concerns on establishing and appointing committees would be drafted immediately and submitted to the UNOLS Council and membership.

Applications for Membership: Application for Associate Membership had been received from the Monterey Bay Aquarium Research Institute (MBARI). The application had been reviewed by the Advisory Council and endorsed; copies had been distributed to UNOLS members in advance of the meeting. The UNOLS membership voted MBARI a UNOLS Member. (Under the new Charter there are no longer Associate Members.)

The Advisory Council, at their October 26 meeting, had reviewed and endorsed an application from Louisiana Universities Marine Consortium (LUMCON) that they become a UNOLS Member and that their R/V PELICAN be designated a UNOLS vessel. Under terms of the new Charter, LUMCON automatically became a UNOLS Member. The UNOLS Membership designated R/V PELICAN a UNOLS vessel.

Academic Fleet Insurance Program: Dolly Dieter, University of Alaska, reported to UNOLS on her recent study of insurance for UNOLS ships.

The study objectives had been to analyze insurance practices throughout UNOLS and to evaluate the efficacy of one or another mode of group insurance.

The analysis portion had followed and updated the 1975 UNOLS report on insurance for the fleet. Several brokers are used by the various UNOLS institutions for both hull insurance and P. & I. Thus, under current practice, there is no opportunity for bulk purchase economies.

It is also noted that ownership of UNOLS ships is one quarter each by NSF, ONR, states or private institutions.

Most UNOLS institutions get their insurance through state or institution risk managers. It is often difficult to get information from risk management offices although Ms. Dieter was successful for this study.

Dennis Nixon, University of Rhode Island, laid out options for UNOLS members. He emphasized that some options were available that would save money over the fleet as a whole. The essential choices:

1. Status Quo. Present rates are generally good, some have even declined recently. No institutional inertia to fight. But prices will go up, and individual institutions could exert little leverage to fight raises.
2. Establish a Pool Insurance Program. This, potentially, would save the most money and would give the greatest control to operators/owners/sponsors. But it would require a large effort in administration and management, and given the diversity in ownership and institutional structure, would probably be too much for UNOLS.
3. Group Insurance Plan. This has potential of savings up to 20-25% for the entire fleet. Implementation would require leadership and a UNOLS focal point. UNOLS would also require a more sophisticated safety program than is presently in place. (This is probably true with or without a change in mode of insurance.)

The Study recommendation is for a Group Insurance Plan.

Foreign Clearances: Tom Cocke, Department of State, Office of Marine Science and Foreign Affairs, summarized 1987 requests for foreign clearances (Appendix XII). The State Department received 288 clearance requests during 1987, to 76 foreign governments. Of these, 34 were denied or not otherwise approved. Research was affected (developed, disrupted or cancelled) on 20 other requests. The percentage of projects disrupted rose to 19% in 1987. The portion of Clearance Requests on which there were problems more than doubled in the last two years. (This is seen as a delayed effect of the Law of the Sea regime.)

Mr. Cocke did not advance a comprehensive solution to the growing problem of foreign clearances, but did enumerate some essentials to improving chances for clearances:

1. Request must be submitted on time, allowing specified lead time and a reasonable allowance for processing within DOS. (Various Notices to Research Vessel Operations of U.S. R/V's list lead-time requirements.)
2. Anyone submitting a Request for Foreign Clearance should know the requirements and expect to adhere to them. Most UNOLS operating institutions have their own focal point for foreign clearances. Let DOS know who that is (and let your own people know, too).
3. The Office of Marine Science is working to systematize the clearance process. They have had a contract employee working on post-cruise obligations for the past two years. That employee (Bob Junghans) is leaving. The most effective way to help the foreign clearance problems is to continue to provide the additional staff in the office.

Lee Stevens, JOI, reported to UNOLS concerning his recent activities relative to foreign clearances. He had been working toward the exchange of experience and information among blue water research vessel operators concerning foreign clearance process and contacts. He had also, in October 1988, made a presentation on foreign clearances to a Forum for International Ship Exchanges held at The Hague. His report included, as had been previously agreed to, a summary of recent foreign clearance experience from UNOLS institutions. Mr. Stevens suggested (as he had earlier at Advisory Council and RVOC meetings) the need for a permanent office to maintain an information base on foreign clearances, expedite requests for clearances and, where possible, act as an advocate for individual requests.

One item on the agenda, Vessel Inspection Program, was not addressed. The meeting was adjourned at 3 p.m.



UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

ANNUAL MEETING AGENDA
 0830, Friday, October 28, 1988
 Board Room
 American Institute of Architects
 1735 New York Avenue NW
 Washington, DC

Introduction and Welcome - George H. Keller, UNOLS Chair

Chairman's Report - George H. Keller will report on UNOLS activities and current issues.

An Address to UNOLS - William E. Evans, Under Secretary of Commerce for Oceans and Atmospheres and Administrator, National Oceanic and Atmospheric Administration will address the membership on NOAA's ocean programs, plans and outlook.

UNOLS Advisory Council Report - Art Maxwell, AC Chair, will report on the Council's activities in 1987-88 and agenda for 1988-89.

UNOLS Fleet Improvement Committee - Worth Nowlin, Jr., FIC Chair will report on 1987-88 accomplishments, issues and plans for coming year.

ALVIN Review Committee - Feenan Jennings, ARC Chair will report on ARC activities, ALVIN program status and plans for 1989-91.

The UNOLS-commissioned Submersible Science Study-the 1990s is complete. Bruce Robison, study leader, will report.

Research Vessel Operators' Council - Jack Bash, RVOC Chair, will report on the RVOC annual meeting (October 4-6) and RVOC activities and issues.

Ship Scheduling Groups - Scheduling Group Chairs will report on schedules for 1989, 1989 ship use, costs versus expected support and recommendations from the Scheduling Groups.

Vessel Inspection Program - Robertson P. Dinmore will report on both Navy INSURV and NSF inspection programs.

Remarks from Federal Funding Agencies - Information from Federal funding agencies (NSF, ONR, DOE, MMS, NOAA and USGS) on forecasts for fiscal 1988, 1989 (and beyond) ship and science support. NSF/DPP representatives will give a status report on an R/V with ice breaking capability. ONR report on AGOR-24, progress on AGOR-23. Other issues that agency representatives may wish to lay before UNOLS.

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The Academic Fleet Insurance Program - Report on the analysis of the insurance program, by Dolly Dieter and Dennis Nixon.

Clearances for Research in Foreign Jurisdictions - Tom Cocks, DOS, Office of Marine Science and Polar Affairs will summarize the 1989 clearance experience. Lee Stevens, JOI, will report on recent consultation with international ship operations managers concerning recent clearance/clearance request experience.

Issues before UNOLS - Several issues have arisen that demand the attention of the UNOLS membership. These issues and UNOLS action will be reported by the Chair for membership discussion:

- MMS policy on research in the EEZ
- Coast Guard proposed rules on drug testing
- Radioisotope use on UNOLS vessels
- Lay-up policy (extension of the RVOC suggestions)
- Laboratory grade facility at sea -- ONR interest
- MCS facilities - UNOLS and the BERNIER and MCS-lease proposals

UNOLS Business

UNOLS Charter - In 1987 the UNOLS membership moved that certain changes be made in the UNOLS Charter. A proposed Charter revision has been distributed and will be presented for adoption by the UNOLS Chair.

Election of UNOLS Chair.

Election of UNOLS Vice-Chair.

Election of Advisory Council member, Member institutions.

Election of Advisory Council member, Associate institutions.

Slates of nominees have been distributed.

Appointment of two Members, ALVIN Review Committee - Recommendations from the ARC will be presented for UNOLS membership action.

Candidate for Associate Membership - The Monterey Bay Aquarium Research Institute's application for Associate Membership is before the Membership for their action.

Other Business - Issues, actions or recommendations as might be introduced by the Advisory Council, Committees or the membership. The order of business may be rearranged to reach a hoped-for mid afternoon adjournment.

UNOLS

UNIVERSITY-NATIONAL
OCEANOGRAPHIC LABORATORY SYSTEM

The University-National Oceanographic Laboratory System is a planning mechanism for oceanographic facilities. It is a joint effort of the academic community and the federal funding agencies, principally the NSF, ONR, NOAA, DOE, MMS and USGS.

UNOLS provides for community-wide cooperation and review of the utilization of facilities and opportunities for access to those facilities. It assesses the match of programs to the needs of academic programs and makes recommendations of priorities for replacing or improving the numbers and mix of facilities.

UNOLS serves as a focus for new ideas and requirements for specialized facilities.

UNOLS does not replace direct contact between the investigator and institution's operating facilities. It does, however, serve as a backup and clearinghouse for information and coordination that might not otherwise be available to the researcher and his laboratory.

UNOLS is composed of institutions and laboratories that operate or utilize Federally supported facilities. It is composed of an Advisory Council of both operators and users, a UNOLS Office hosted by a member institution, the Research Vessel Operator's Council and committees dealing with advanced planning, national facilities and fleet replacement. Membership consists of persons from major oceanographic facility operators whose role is to provide facility services to other users. Associate Membership is available to ship users and operators of other vessels. Membership in either category does not guarantee Federal funding.

For further information
please contact:

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UNOLS Office, WB-15
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University of Washington
Seattle, WA 98195

(206) 543-2203

ANNOUNCEMENT OF AGENDA

UNOLS ANNUAL MEETING

October 28, 1988

Board Room
American Institute of Architects
1735 New York Avenue, N.W.
Washington, D.C.

This meeting is open to all investigators, users, operators and sponsors of university oceanographic facilities. It is a public forum for discussing the utilization and scheduling of research vessels and other facilities as well as their support and future planning.

George H. Keller, Chairman

William D. Barbee, Executive Secretary

UNOLS ANNUAL MEETING

Washington, DC / October 26-28, 1988

ATTENDEES

E. Eugene Allmendinger, University of New Hampshire
William D. Barbee, University of Washington
Jack Bash, University of Rhode Island
Douglas C. Biggs, Texas A&M University
Garrett W. Brass, University of Miami
Douglas R. Caldwell, Oregon State University
W. Thomas Cocke, U.S. Department of State
Bruce K. Cornwall, Johns Hopkins University
James W. Coste, University of Hawaii
Patrick J. Dennis, Joint Oceanographic Institutions, Inc.
Emma R. Dieter, University of Alaska
Robertson P. Dinsmore, Woods Hole Oceanographic Institution
William Erb, Department of State
Tom Forhan, National Science Foundation
Robert D. Gerrard, Lamont-Doherty Geological Observatory
Donn S. Gorsline, University of Southern California
George D. Grice, Woods Hole Oceanographic Institution
James J. Griffin, University of Rhode Island
Louis F. Hannigan, Lamont-Doherty Geological Observatory
Donald F. Heinricks, National Science Foundation
Ron Hutchinson, University of Miami
K. William Jeffers, University of Washington
Feenan D. Jennings, Texas A&M University
Thomas C. Johnson, Duke/UNC Oceanographic Consortium
Keith W. Kaulum, Office of Naval Research
George H. Keller, Oregon State University
John T. Lehman, University of Michigan
Dean E. Letzring, Texas A&M University
Paul Ljunggren, University of Miami
Nancy L. McGee, Naval Postgraduate School, Monterey
Scott McKellar, National Oceanic & Atmospheric Administration
John H. Martin, Moss Landing Marine Laboratory
Barbara J. Martineau, Woods Hole Oceanographic Institution
Arthur E. Maxwell, University of Texas
David W. Menzel, Skidaway Institute of Oceanography
Brad Mooney, Harbor Branch Oceanographic Institution
Donald L. Newman, University of Southern California
Arthur R.M. Nowell, University of Washington
John C. Ogden, Florida Institute of Oceanography
Wadsworth Owen, University of Delaware
Kennard M. Palfrey, Oregon State University
Steven C. Rabalais, Louisiana Universities Marine Consortium
Steven E. Ramberg, Office of Naval Research
Carol A. Roberts, National Science Foundation

Bruce H. Robison, Monterey Bay Aquarium Research Institute
Thomas C. Royer, University of Alaska
Judy Rubano, University of Hawaii
George G. Shor, Jr., Scripps Institution of Oceanography
Daniel S. Schwartz, Harbor Branch Oceanographic Institution
Lee R. Stevens, Joint Oceanographic Institutions, Inc.
Alexander L. Sutherland, National Science Foundation
Carolyn A. Thoroughgood, University of Delaware
Joe F. Ustach, Duke/UNC Marine Laboratory
Richard West, National Science Foundation
Peter E. Wilkniss, National Science Foundation
Robert S. Wolf, National Oceanic & Atmospheric Administration

MEMBERS

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UNIVERSITY OF DELAWARE
Dr. Carolyn A. Thoroughgood

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Dr. Dirk Frankenberg

UNIVERSITY OF HAWAII
Dr. Charles E. Helsley

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UNIVERSITY OF TEXAS
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Dr. James J. McCarthy

HOBART & WILLIAM SMITH COLLEGES
Mr. F. Richard Wilkins

LEHIGH UNIVERSITY
Dr. Bobb Carson

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UNIVERSITY OF MAINE
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MARINE SCIENCE CONSORTIUM
Dr. Robert W. Hinds

UNIVERSITY OF MARYLAND
Dr. Tom Malone

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
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AT BUFFALO

NEW YORK STATE UNIVERSITY AT
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VIRGINIA INSTITUTE OF MARINE SCIENCE
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WALLA WALLA COLLEGE
Dr. Lawrence McCloskey

UNIVERSITY OF WISCONSIN AT MADISON
Dr. Robert A. Ragotzkie

UNIVERSITY OF WISCONSIN AT MILWAUKEE
Dr. David E. Edgington

UNIVERSITY OF WISCONSIN AT SUPERIOR
Ms. Mary Balcer

SHIP SCHEDULING CONTACT

Appendix IV

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

Rev. 7/88

OPERATOR	NAME	LOA (FT/M)	BUILT/ CONVERTED	NO. of SCIENT.	CARRIER	SHIP SCHEDULING CONTACT
University of Hawaii Hawaii Institute of Geophysics 2525 Correa road	MOANA WAVE	213/65	1973/1984	20	NAVY	Cpt. J.W. Costa Marine Superintendent (808) 847-266
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. Arthur Nowell Director (206) 543-6487
Oregon State University College of Oceanography Newport, Oregon 97365	WECOMA	177/54	1973	16	NSF	Cpt. Kennard M. Palfrey Marine Superintendent (503) 867-3011
Moss Landing Marine Laboratories PO Box 223 Moss Landing, California 95039	POINT SUR	135/41	1981	12	NSF	Mr. Michael Prince Ship Schedulers (408) 633-3304
University of Southern California Inst. of Marine & Coastal Studies 820 South Seaside Avenue Terminal Island, California 90731	OSPREY	110/34	1948/1972	12	USC	Mr. Don Newman, Mgr. Marine Support Facility (213) 830-4570
University of California, San Diego Scripps Institutions 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) 534-2853
University of Michigan Great Lakes & Marine Waters Center 2200 Bonisteel Boulevard Ann Arbor, Michigan 48109	LAURENTIAN	80/24	1974	8	U.MI.	Dr. Linda Goad Marine Superintendent (313) 763-5393
Texas A&M University Department of Oceanography PO Box 3236, Galveston, TX 77552	GYRE					Cpt. Dean Letsring Marine Superintendent (409) 740-4468
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
The University of Miami, RSMAS Planet Ocean Marine Facility Marine Department 3979 Rickenbacker Causeway Virginia Key, FL 33149	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	JHU	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 Ops. (302) 645-4320
Lamont-Doherty Geo. Observatory Columbia University Palisades, New York 10964	CONRAD	209/64	1962	23	NAVY	Mr. Michael Rawson Marine Science Coord. (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 Inst. Woods Hole, Massachusetts 02543	KNOER 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. Admin. (508) 548-1400, Ex. 2450

*20 Scientists (includes one medic)
Plus 9 ALVIN group
#Includes one Marine Technician

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

5/88

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 College of Oceanography Newport, OR 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	OSPREY	220/68	1973/1988	14	25	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.MI.	Dr. Linda Goad Marine Superintendent (313) 763-5393
Texas A & M University Department of Oceanography PO Box 3236, Galveston, TX 77552	GYRE	182/54	1973	11	21	NAVY	Cpt. Dean Letzring Marine Superintendent (409) 740-4468
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	Cpt. Joe Coburn Manager, Marine Operations (617) 548-1400, Ext. 2277
			Totals	320	409		

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

UNOLS RESEARCH VESSELS FLEET OPERATIONS - 1987 -

CRUISE DAYS PROFILES

09/30/88

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	577.2	.00	651.05	1047.21	47.00	41.00	.00	976.50	.00	11.00	12.00	179.63	3542.61
OFF. NAVAL RESEARCH	160.0	4.40	27.00	98.00	.00	.00	.00	152.80	.00	41.00	.00	25.00	508.20
U.S. GEOL. SURVEY	.0	.00	.00	.00	.00	.00	.00	4.00	.00	.00	.00	.00	4.00
MINERALS MNGT. SER.	7.0	.00	.00	.00	23.00	.00	.00	.00	.00	.00	.00	.00	30.00
NATL OCEAN/ATMOSPH	.0	.00	.00	.00	.00	1.00	.00	.00	.00	.00	.00	2.00	3.00
DEPT. OF ENERGY	43.0	.00	1.00	67.00	.00	.00	.00	17.00	.00	.00	.00	.00	128.00
OTHER FEDERAL	56.0	7.00	3.00	6.00	.00	.00	.00	59.00	.00	.00	.00	.00	131.00
STATE/MUNICIPAL	24.0	2.60	59.00	42.00	1.00	35.00	.00	63.70	.00	2.00	37.00	1.00	267.30
OTHER/PRIVATE	25.0	.00	.00	.00	.00	.00	.00	5.00	.00	.00	.00	5.00	35.00

TOTALS	892.22	14.00	741.05	1260.21	71.00	77.00	.00	1278.00	.00	54.00	49.00	212.63	4649.11
PERCENT	19.19	.30	15.94	27.11	1.53	1.66	.00	27.49	.00	1.16	1.05	4.57	100.00

UNOLS RESEARCH VESSELS FLEET OPERATIONS - 1987 -

CRUISE DAYS PROFILES

09/30/88

INSTITUTION	PHYS OCEAN	ACCOUSTICS	CHEM OCEAN	BIOL OCEAN	ENVIR ECOL	FISH INVST	CLIM METEO	GEOLO GEOPH	MAP CHRTG	OCEAN ENGRG	TRAIN ING	TRANS NONSCI	TOTAL -----
UNIV. HAWAII	.00	.00	49.00	.00	.00	.00	.00	266.00	.00	.00	.00	18.00	333.00
UNIV. ALASKA	75.00	.00	22.00	65.00	30.00	24.00	.00	.00	.00	.00	1.00	.00	217.00
UNIV. WASHINGTON	105.22	.00	123.05	119.21	2.00	3.00	.00	7.00	.00	.00	10.00	32.63	402.11
OREGON STATE UNIV.	123.00	.00	27.00	59.00	15.00	.00	.00	12.00	.00	.00	.00	3.00	239.00
SCRIPPS INST. OCEAN	140.00	7.00	192.00	179.00	23.00	32.00	.00	240.00	.00	.00	10.00	23.00	946.00
TEXAS A&M UNIV.	.00	.00	94.00	9.00	.00	.00	.00	13.00	.00	.00	16.00	.00	132.00
UNIV. TEXAS	.00	.00	.00	.00	.00	.00	.00	282.00	.00	.00	.00	.00	282.00
UNIV. MIAMI, RSMAS	91.00	.00	36.00	193.00	.00	.00	.00	31.00	.00	.00	.00	.00	351.00
UNIV GA., SKIDAWAY	29.00	.00	3.00	78.00	.00	.00	.00	1.00	.00	.00	.00	.00	111.00
DUKE UNIV/UNC	3.00	.00	7.00	96.00	.00	.00	.00	33.00	.00	.00	.00	.00	139.00
JOHNS HOPKINS UNIV.	1.00	.00	12.00	40.00	.00	14.00	.00	.00	.00	.00	.00	.00	67.00
UNIV. DELAWARE	30.00	.00	46.00	11.00	.00	.00	.00	14.00	.00	.00	12.00	.00	113.00
LAMONT-DOHERTY GEOL	85.00	.00	.00	.00	.00	.00	.00	153.00	.00	.00	.00	43.00	281.00
UNIV. RHODE ISLAND	115.00	.00	48.00	35.00	.00	.00	.00	.00	.00	3.00	.00	8.00	209.00
WOODS HOLE OCEAN	38.00	.00	52.00	232.00	.00	.00	.00	215.00	.00	49.00	.00	84.00	670.00
UNIV. MICHIGAN	.00	.00	.00	60.00	1.00	2.00	.00	.00	.00	2.00	.00	.00	65.00
MOSS LANDING MAR LAB	57.00	7.00	30.00	84.00	.00	2.00	.00	11.00	.00	.00	.00	1.00	192.00

TOTALS	892.22	14.00	741.05	1260.21	71.00	77.00	.00	1276.00	.00	54.00	49.00	212.63	4649.11
PERCENT	19.19	.30	15.94	27.11	1.53	1.66	.00	27.49	.00	1.16	1.05	4.57	100.00

UNOLS RESEARCH VESSELS FLEET OPERATIONS - 1987 -

09/30/88

CRUISE DAYS PROFILES

VESSEL	PHYS OCEAN	ACCOUSTICS	CHEM OCEAN	BIOL OCEAN	ENVIR ECOL	FISH INVST	CLIM METEO	GEOLO GEOPH	MAP CHRTG	OCEAN ENGRG	TRAIN ING	TRANS NONSCI	TOTAL -----
MELVILLE	40.00	.00	95.00	41.00	.00	.00	.00	43.00	.00	.00	.00	12.00	231.00
KNORR	18.00	.00	25.00	.00	.00	.00	.00	.00	.00	40.00	.00	43.00	126.00
ATLANTIS II	.00	.00	17.00	78.00	.00	.00	.00	174.00	.00	.00	.00	41.00	310.00
CONRAD	85.00	.00	.00	.00	.00	.00	.00	153.00	.00	.00	.00	43.00	281.00
T.G. THOMPSON	103.22	.00	64.05	61.21	.00	.00	.00	.00	.00	.00	.00	30.63	259.11
T. WASHINGTON	.00	.00	52.00	.00	.00	.00	.00	179.00	.00	.00	.00	.00	231.00
ENDEAVOR	115.00	.00	48.00	35.00	.00	.00	.00	.00	.00	3.00	.00	8.00	209.00
OCEANUS	20.00	.00	10.00	154.00	.00	.00	.00	41.00	.00	9.00	.00	.00	234.00
WECOMA	123.00	.00	27.00	59.00	15.00	.00	.00	12.00	.00	.00	.00	3.00	239.00
GYRE	.00	.00	94.00	9.00	.00	.00	.00	13.00	.00	.00	16.00	.00	132.00
MOANA WAVE	.00	.00	49.00	.00	.00	.00	.00	266.00	.00	.00	.00	18.00	333.00
ISELIN	91.00	.00	38.00	35.00	.00	.00	.00	17.00	.00	.00	.00	.00	179.00
NEW HORIZON	56.00	.00	25.00	100.00	.00	32.00	.00	.00	.00	.00	1.00	10.00	224.00
FRED H. MOORE	.00	.00	.00	.00	.00	.00	.00	282.00	.00	.00	.00	.00	282.00
POINT SUR	57.00	7.00	30.00	84.00	.00	2.00	.00	11.00	.00	.00	.00	1.00	192.00
CAPE HATTERAS	3.00	.00	7.00	96.00	.00	.00	.00	33.00	.00	.00	.00	.00	139.00
ALPHA HELIX	75.00	.00	22.00	65.00	30.00	24.00	.00	.00	.00	.00	1.00	.00	217.00
ROBERT G. SPROUL	44.00	7.00	20.00	38.00	23.00	.00	.00	18.00	.00	.00	9.00	1.00	160.00
CAPE HENLOPEN	30.00	.00	48.00	11.00	.00	.00	.00	14.00	.00	.00	12.00	.00	113.00
WARFIELD	1.00	.00	12.00	40.00	.00	14.00	.00	.00	.00	.00	.00	.00	67.00
BLUE FIN	29.00	.00	3.00	78.00	.00	.00	.00	1.00	.00	.00	.00	.00	111.00
CLIFFORD BARNES	2.00	.00	59.00	58.00	2.00	3.00	.00	7.00	.00	.00	10.00	2.00	143.00
CALANUS	.00	.00	.00	158.00	.00	.00	.00	14.00	.00	.00	.00	.00	172.00
LAURENTIAN	.00	.00	.00	60.00	1.00	2.00	.00	.00	.00	2.00	.00	.00	65.00

TOTALS	892.22	14.00	741.05	1260.21	71.00	77.00	.00	1278.00	.00	54.00	49.00	212.63	4649.11
PERCENT	19.19	.30	15.94	27.11	1.53	1.66	.00	27.49	.00	1.16	1.05	4.57	100.00

UNOLS RESEARCH VESSELS FLEET OPERATIONS - 1987 -

OPERATIONAL DAYS CHARGED BY SPONSOR

09/30/88

INSTITUTION	NATL SCI. FNDTN	OFF. NAVAL RES.	U.S. GEOL SURV.	MNRSL MNGMT SERV.	NATL OCEAN ATMOS	DEPT OF ENRGY	OTHER FEDER FUNDS	STATE OR MUNIC	PRIV/ FORGN FUNDS	TOTALS -----
UNIV. HAWAII	247.00	32.00	.00	.00	.00	.00	52.00	2.00	.00	333.00
UNIV. ALASKA	213.00	.00	.00	.00	.00	.00	.00	1.00	3.00	217.00
UNIV. WASHINGTON	385.11	.00	2.00	.00	2.00	.00	1.00	12.00	.00	402.11
OREGON STATE UNIV.	198.00	41.00	.00	.00	.00	.00	.00	.00	.00	239.00
SCRIPPS INST. OCEAN	588.00	93.20	.00	30.00	.00	36.00	2.00	113.80	5.00	846.00
TEXAS A&M UNIV.	40.00	.00	.00	.00	.00	.00	.00	92.00	.00	132.00
UNIV. TEXAS	256.00	.00	.00	.00	.00	.00	6.00	20.00	.00	282.00
UNIV. MIAMI, RSMAS	310.00	24.00	.00	.00	.00	17.00	.00	.00	.00	351.00
UNIV GA., SKIDAWAY	35.00	.00	.00	.00	.00	75.00	1.00	.00	.00	111.00
DUKE UNIV/UNC	129.50	.00	.00	.00	.00	.00	.00	9.50	.00	139.00
JOHNS HOPKINS UNIV.	67.00	.00	.00	.00	.00	.00	.00	.00	.00	67.00
UNIV. DELAWARE	76.00	14.00	.00	.00	.00	.00	.00	1.00	22.00	113.00
LAMONT-DOHERTY GEOL	211.00	65.00	.00	.00	.00	.00	.00	.00	5.00	281.00
UNIV. RHODE ISLAND	131.00	78.00	.00	.00	.00	.00	.00	.00	.00	209.00
WOODS HOLE OCEAN	513.00	158.00	1.00	.00	.00	.00	.00	.00	.00	670.00
UNIV. MICHIGAN	55.00	.00	.00	.00	1.00	.00	4.00	5.00	.00	65.00
MOSS LANDING MAR LAB	110.00	5.00	1.00	.00	.00	.00	65.00	11.00	.00	192.00

TOTALS	3542.61	508.20	4.00	30.00	3.00	128.00	131.00	287.30	35.00	4649.11
PERCENT	76.2	10.9	.1	.6	.1	2.8	2.8	5.7	.8	100.0

UNOLS RESEARCH VESSELS FLEET OPERATIONS - 1987 -

OPERATIONAL DAYS CHARGED BY SPONSOR

09/30/88

VESSEL	LOA	NATL SCI. FNDTN	OFF. NAVAL RES.	U.S. GEOL. SURV.	MNRSL MNGMT SERV.	NATL OCEAN ATMOS	DEPT OF ENRGY	OTHER FEDER FUNDS	STATE OR MUNIC	PRIV/ FORGN FUNDS	TOTALS -----
MELVILLE	245FT	199.00	28.80	.00	.00	.00	.00	.00	3.20	.00	231.00
KNORR	245FT	62.00	64.00	.00	.00	.00	.00	.00	.00	.00	126.00
ATLANTIS II	210FT	294.00	16.00	.00	.00	.00	.00	.00	.00	.00	310.00
CONRAD	209FT	211.00	65.00	.00	.00	.00	.00	.00	.00	5.00	281.00
T.G. THOMPSON	209FT	259.11	.00	.00	.00	.00	.00	.00	.00	.00	259.11
T. WASHINGTON	209FT	182.00	34.00	.00	.00	.00	.00	.00	10.00	5.00	231.00
ENDEAVOR	177FT	131.00	78.00	.00	.00	.00	.00	.00	.00	.00	209.00
OCEANUS	177FT	157.00	76.00	1.00	.00	.00	.00	.00	.00	.00	234.00
WECOMA	177FT	198.00	41.00	.00	.00	.00	.00	.00	.00	.00	239.00
GYRE	174FT	40.00	.00	.00	.00	.00	.00	.00	92.00	.00	132.00
MOANA WAVE	210FT	247.00	32.00	.00	.00	.00	.00	52.00	2.00	.00	333.00
ISELIN	170FT	145.00	17.00	.00	.00	.00	17.00	.00	.00	.00	179.00
NEW HORIZON	170FT	133.00	14.00	.00	.00	.00	30.00	2.00	45.00	.00	224.00
FRED H. MOORE	165FT	256.00	.00	.00	.00	.00	.00	6.00	20.00	.00	282.00
POINT SUR	135FT	110.00	5.00	1.00	.00	.00	.00	65.00	11.00	.00	192.00
CAPE HATTERAS	135FT	129.50	.00	.00	.00	.00	.00	.00	9.50	.00	139.00
ALPHA HELIX	133FT	213.00	.00	.00	.00	.00	.00	.00	1.00	3.00	217.00
ROBERT G. SPROUL	125FT	52.00	16.40	.00	30.00	.00	6.00	.00	55.60	.00	160.00
CAPE HENLOPEN	120FT	76.00	14.00	.00	.00	.00	.00	.00	1.00	22.00	113.00
WARFIELD	106FT	67.00	.00	.00	.00	.00	.00	.00	.00	.00	67.00
BLUE FIN	72FT	35.00	.00	.00	.00	.00	75.00	1.00	.00	.00	111.00
CLIFFORD BARNES	65FT	126.00	.00	2.00	.00	2.00	.00	1.00	12.00	.00	143.00
CALANUS	64FT	165.00	7.00	.00	.00	.00	.00	.00	.00	.00	172.00
LAURENTIAN	80FT	55.00	.00	.00	.00	1.00	.00	4.00	5.00	.00	65.00

TOTALS		3542.61	508.20	4.00	30.00	3.00	128.00	131.00	267.30	35.00	4649.11
PERCENT		76.2	10.9	.1	.6	.1	2.8	2.8	5.7	.8	100.0

UNOLS RESEARCH VESSELS FLEET OPERATIONS - 1987 -

PROJECT PERSON-DAYS AT SEA BY SPONSOR

09/30/88

VESSEL	LOA	TOTAL DAYS CHRGD	NATL SCI. FNDTN	OFF. NAVAL RES.	U.S. GEOL. SURV.	MNRLS MNGMT SERV.	NATL OCEAN ATMOS	DEPT. OF ENRGY	OTHER FEDER FUNDS	STATE OR MUNIC	PRIV/ FORGN FUNDS	TOTALS -----
MELVILLE	245	231.00	2837.00	446.00	.00	.00	.00	.00	.00	64.00	.00	3347.00
KNORR	245	126.00	871.00	699.00	.00	.00	.00	.00	.00	.00	.00	1570.00
ATLANTIS II	210	310.00	5526.00	407.00	.00	.00	.00	.00	.00	.00	.00	5935.00
CONRAD	209	261.00	3077.00	1297.00	.00	.00	.00	.00	.00	.00	33.00	4407.00
T.G. THOMPSON	209	259.11	4939.45	.00	.00	.00	.00	.00	.00	.00	.00	4939.45
T. WASHINGTON	209	231.00	2562.00	476.00	.00	.00	.00	.00	.00	130.00	60.00	3228.00
ENDEAVOR	177	209.00	1186.00	860.00	.00	.00	.00	.00	.00	.00	.00	2045.00
OCEANUS	177	234.00	1829.00	916.00	12.00	.00	.00	.00	.00	.00	.00	2557.00
WECOMA	177	239.00	2816.00	595.00	.00	.00	.00	.00	.00	.00	.00	3411.00
GYRE	174	132.00	664.00	.00	.00	.00	.00	.00	.00	1437.00	.00	2101.00
MOANA WAVE	210	333.00	4139.00	458.00	.00	.00	.00	.00	892.00	30.00	.00	5519.00
ISELIN	170	179.00	1826.00	380.00	.00	.00	.00	425.00	.00	.00	.00	2631.00
NEW HORIZON	170	224.00	1511.00	224.00	.00	.00	.00	478.00	34.00	594.00	.00	2841.00
FRED H. MOORE	165	292.00	4198.00	.00	.00	.00	.00	.00	102.00	340.00	.00	4640.00
POINT SUR	135	192.00	994.00	50.00	12.00	.00	.00	.00	722.00	214.00	.00	1992.00
CAPE HATTERAS	135	139.00	1663.50	.00	.00	.00	.00	.00	.00	125.50	.00	1789.00
ALPHA HELIX	133	217.00	2312.00	.00	.00	.00	.00	.00	.00	12.00	24.00	2348.00
ROBERT G. SPROUL	125	180.00	511.00	106.60	.00	388.00	.00	90.00	.00	624.40	.00	1722.00
CAPE HENLOPEN	120	113.00	798.00	120.00	.00	.00	.00	.00	.00	4.00	110.00	1032.00
WARFIELD	106	67.00	434.00	.00	.00	.00	.00	.00	.00	.00	.00	434.00
BLUE FIN	072	111.00	79.00	.00	.00	.00	.00	286.00	3.00	.00	.00	368.00
CLIFFORD BARNES	085	143.00	626.00	.00	10.00	.00	6.00	.00	2.00	547.00	.00	1191.00
CALANUS	064	172.00	1080.00	34.00	.00	.00	.00	.00	.00	.00	.00	1114.00
LAURENTIAN	080	65.00	187.00	.00	.00	.00	3.00	.00	12.00	49.00	.00	251.00

TOTALS		4049.11	46466.95	7070.60	34.00	388.00	9.00	1279.00	1767.00	4170.90	227.00	61412.45

UNOLS RESEARCH VESSELS FLEET OPERATIONS - 1987 -

UNOLS CRUISE PARTICIPANTS AND AFFILIATIONS

09/28/88

SHIP	SCI	TECH	GRAD	STU/OBS	TOTAL	ASSOC	NON-UNOLS	FED	FRGN	TOTAL	
MOANA WAVE	57	92	44	15	208	0	0	0	0	0	
ALPHA HELIX	65	28	28	31	150	0	0	0	0	0	
T.G. THOMPSON	53	79	41	10	183	23	9	1	18	51	
CLIFFORD BARNES	38	60	72	168	338	2	0	5	1	8	
WECOMA	55	100	50	2	207	0	0	0	0	0	
MELVILLE	48	86	27	25	186	0	0	0	0	0	
ROBERT G. SPROUL	89	117	75	85	366	0	0	0	0	0	
NEW HORIZON	73	105	45	17	240	0	0	0	0	0	
T. WASHINGTON	36	80	37	16	169	0	0	0	0	0	
GYRE	50	52	108	36	246	0	0	0	0	0	
FRED H. MOORE	33	51	28	20	132	0	0	0	0	0	
ISELIN	67	137	34	10	248	0	0	0	0	0	
CALANUS	30	11	30	1	72	0	0	0	0	0	
BLUE FIN	34	97	3	19	153	0	0	0	0	0	
CAPE HATTERAS	52	34	39	31	156	0	0	0	0	0	
WARFIELD	43	66	32	45	186	0	0	0	0	0	
CAPE HENLOPEN	85	72	81	31	269	0	0	0	0	0	
CONRAD	63	118	14	9	204	0	0	0	0	0	
ENDEAVOR	78	74	44	12	208	0	0	0	0	0	
ATLANTIS II	113	126	68	29	336	0	0	0	0	0	
KNORR	18	65	5	25	111	0	0	0	0	0	
OCEANUS	122	106	23	23	274	0	0	0	0	0	
LAURENTIAN	22	26	11	22	81	0	0	0	0	0	
POINT SUR	95	64	199	66	424	0	0	0	0	0	
*****	TOTALS	1417	1844	1138	748	5147	25	9	6	19	59
PERCENT	27.5	35.8	22.1	14.5	100.0	.5	.2	.1	.4	1.1	

THIS
SECTION
NOT

COMPLETE

MEMORANDUM OF AGREEMENT
JOINT RESEARCH SHIP POLICY
FOR
THE NATIONAL SCIENCE FOUNDATION
AND
OFFICE OF THE NAVAL RESEARCH

The Office of Naval Research (ONR) and National Science Foundation (NSF), "the Agencies", have as a joint objective the goal of providing a safe and efficient academic research fleet for the conduct of oceanographic research. In keeping with this objective, the following items of policy are set forward:

1. THE RESEARCH FLEET:

For the purposes of this policy statement, the "Academic Research Fleet" will continue to be defined to include UNOLS ships plus other vessels as established by the agencies' science and mission requirements. Small craft will not be included in this definition.

2. SHIP SCHEDULING:

The University-National Oceanographic Laboratory System (UNOLS) Scheduling Committee will continue to be the primary scheduling mechanism for the research fleet. The Agencies are pleased with the past performance of UNOLS and have no desire to change the present ship scheduling system.

Each of the agencies will review the proposed schedules of their ships for practicality and feasibility before implementation. The number of sailing days per year, ship location at the end of a year, and optimum vessel utilization will be considered before the schedules are implemented.

3. TRANSIT COSTS:

Transit costs will be considered a part of cruise legs. Normally, the ship time will be apportioned between the two science legs that incorporate the transit on a simple proportional basis keyed to the length of the two legs. It is not the intention of this policy to preclude the flexibility necessary for implementing actual schedules and ship routing once transit time assessments have been made.

4. MAINTENANCE:

The Agencies agree that primary responsibility for maintenance, replacement, and upgrading or modification of their ships must remain with the agency owning the vessel. This includes lead responsibility for maintenance and modification efforts conducted during yard and lay-up periods.

5. LAY-UP COSTS:

The agencies will provide joint support for core staff and normal maintenance during lay-ups of agency owned ships. Any additional maintenance or modification efforts conducted during the lay-up period other than that required to keep the ship in operating condition will be the responsibility of the agency owning the vessel.

ONR/NSF, in recognition of the importance of our combined support of the U.S. academic fleet, will pay the cost of lay-up of ONR- or NSF-owned vessels based on the ratio of our ships' operating budgets.

Funding for ~~lay-up of other than NSF and ONR owned ships in the UNOLS~~ fleet will be dealt with on an individual basis.

6. FLEET REPLACEMENT:

The Agencies agree on the need for joint planning on matters related to replacement of the aging research fleet. The advice and counsel of UNOLS will be critical to fleet replacement planning efforts, e.g. the Fleet Improvement Committee of UNOLS, but final decisions must rest with the Agencies. The primary points of contact for fleet improvement/replacement discussions will be the Head, Oceanographic Centers and Facilities Section of the National Science Foundation and the Director, Ocean Engineering Division of the Office of Naval Research, or their successors should personnel changes occur.

7. OTHER FACILITIES:

The Agencies are willing to consider facilities other than ships for improving the National capability to make oceanographic measurements at sea. It is anticipated that the UNOLS Advisory Council will be the primary source for alternate facility recommendations. The Agencies will work together to consider any such recommendations and may draw on the expertise of other advisory groups to assist in decision making.

It is agreed that individual agency initiatives related to alternative facilities will be coordinated with the other agency prior to being submitted to UNOLS for their comments and recommendations.

The Agencies note that the DSV ALVIN Agreement is a successful model for management of special facilities. This management approach will be used as a point of departure for any other unique facilities considered by the Agencies.

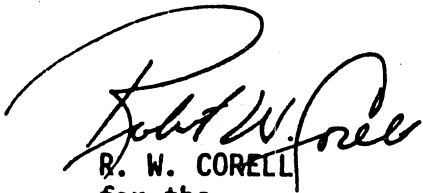
8. COORDINATION:

The Agencies wish to take notice of the long, friendly, and cooperative nature of their relations relating to the research fleet over the past decades. The intention of this policy statement is to codify practices necessary for optimum use and formulation of the academic research fleet during a time of change in both the scope of ocean science and in the composition of the academic fleet. We look forward to a future that offers a more capable academic research fleet and an equitable distribution of research fleet costs between ONR and NSF.

9. CANCELLATION:

This agreement may be cancelled at any time by mutual consent of the parties concerned. This agreement may also be cancelled by either party upon giving at least 90 days written notice to the other party.

Should matters of concern arise, the initial points of contact for policy coordination and decisions will be the Head, Oceanographic Centers and Facilities Section of the National Science Foundation and the Director, Ocean Engineering Division or their successors.



R. W. CORELL
for the
National Science Foundation
dated: *Oct. 17, 1988*



F. E. SAALFELD
for the
Office of Naval Research
dated:

UNOLS FLEET IMPROVEMENT COMMITTEE

Objectives:

- Amplify and update the UNOLS Fleet Improvement Plan.
- Continue to refine scientific mission requirements.
- Initiate and carry through concept design studies.
- Consider alternatives to new construction for meeting scientific mission requirements.
 1. Refits and improvements to existing UNOLS vessels may render them more capable and economical, and extend their service life.
 2. There are numerous relatively new vessels in the merchant fleet which might be converted.
- Carry new concept designs for selected vessels into more detailed design phases.
- Serve as liaison activity and information source for Federal agency representatives working on matters of planning or funding for new construction and upgrading of UNOLS vessels.

28 October 1988

**UNOLS
FLEET IMPROVEMENT COMMITTEE**

Dr. Richard Barber	Duke University Marine Lab
Cptn. R. P. Dinsmore	Woods Hole Ocean. Inst.
Dr. Donn Gorsline	University of Southern Calif.
Dr. Marcus Langseth	Lamont-Doherty Geol. Obsv.
Dr. James Murray	University of Washington
Dr. Worth Nowlin (Chmn.)	Texas A&M University
Dr. Bruce H. Robison	Univ. of Calif., Santa Barbara
Dr. Fred Spiess	Univ. of Calif., San Diego
Cptn. T. K. Treadwell (Exec. Sec.)	Texas A&M University

25 October 1988

Specific FIC Activities

October 1987 - October 1988

Continuing review of Federal agency plans and provision of advice to agencies as requested.

Specific review of NAVSEA design of large SWATH for AGOR-24. Recommendation that UNOLS not accept ship.

Initiation of preliminary design study of large general-purpose monohull research vessel by Glosten and Associates. Based on earlier concept design. Tank tests complete. Final report expected March 1989.

Concept design of intermediate general purpose SWATH research ship by SEACO completed June 1988. Distributed as UNOLS FIC report. Very promising. Additional redesign of this 4-strut vessel to improve seakeeping planned.

Inspected a group of surplus vessels held by MARAD, evaluated for conversion to intermediate general purpose research ships, and estimated costs.

Developed new scientific mission requirements, including community review, for:

- small, general purpose, monohull research vessel
- intermediate, general purpose, SWATH research vessel
- multichannel seismic capability

Begin development of new scientific mission requirements for:

- small-intermediate ice-capable research vessel
- stable, deep ocean platform (improved FLIP)
- research submarine

Special studies, including:

- needs for icebreaking and ice-capable research ships in the Arctic
- potential improvements and refit requirements for existing intermediate vessels
- history of U.S. oceanographic fleet and sources of vessels
- computer assistance in scheduling and record keeping

28 October 1988

Multichannel Seismic Capability

- Science needs do not now justify a full-time multichannel seismic vessel in the UNOLS fleet.
- Multichannel seismic capability is needed on some research vessels in the UNOLS fleet; it is suggested that built-in compressor capability (2 to 3 compressors in a dedicated space) be provided on at least two vessels of the UNOLS fleet.
- True state-of-the-art multichannel seismic capability probably cannot be maintained by the community for part-time use; it is suggested that such capability be leased as needed.

28 October 1988

FIC Reports

October 1987 - October 1988

Alexander, Vera, *et al.*, Arctic Science Requirements for Ice-Worthy Research Vessels, UNOLS Fleet Improvement Committee Report, 21 pp., UNOLS Fleet Improvement Committee Office, Texas A&M University, College Station, TX 77843-3146, 1988.

Langseth, Marcus, and Worth Nowlin, USS Database, *Eos*, Transactions of the American Geophysical Union, Vol. 69, No. 33, August 16, 1988, p. 788.

Murray, James W., Richard Barber, and Marcus Langseth, Scientific Requirements for the UNOLS Fleet, UNOLS Fleet Improvement Committee Report, 25 pp., UNOLS Fleet Improvement Committee Office, Texas A&M University, College Station, TX 77843-3146, 1988.

SEACO, Concept Design For A General Purpose SWATH Oceanographic Research Ship, UNOLS Fleet Improvement Committee Report, 86 pp + 3 Appendices, UNOLS Fleet Improvement Committee Office, Texas A&M University, College Station, TX 77843-3146, 1988.

Treadwell, T.K., D.S. Gorsline, and R. West, History of the U.S. Academic Oceanographic Research Fleet and the Sources of Research Ships, UNOLS Fleet Improvement Committee Report, 55 pp., UNOLS Fleet Improvement Committee Office, Texas A&M University, College Station, TX 77843-3146, 1988.

UNOLS Fleet Improvement Committee, Scientific Mission Requirements for Oceanographic Research Vessels, UNOLS Fleet Improvement Committee Report, 40 pp., UNOLS Fleet Improvement Committee Office, Texas A&M University, College Station, TX 77843-3146, 1988.

Specific FIC Activities

Planned for 1989

Concept design of two-strut intermediate SWATH research ship.

Studies to define possible improvements to existing intermediates on CAPE-class vessels.

Completion and refinements of scientific mission requirements for complete range of vessel types.

Concept design study for intermediate, ice-capable Arctic research ship.

Concept design study for small SWATH research ship.

Possible concept design studies of improved FLIP and research submarine.

Revised Fleet Improvement Plan.

FIC is flexible.

28 October 1988

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

An association of institutions
for the coordination and support
of university oceanographic facilities

UNOLS Office, WB- 15
School of Oceanography
University of Washington
Seattle, Washington 98195
(206) 543-2203

September 15, 1988

To: Don Heinrichs, NSF
David Duane, NOAA
Keith Kaulum, ONR

Through: George Keller, Chair, UNOLS

From: Feenan Jennings, Chair, ALVIN Review Committee

Subject: ALVIN/International Exchanges

In my May 20, 1988 response to your request that ARC should address issues concerning international exchanges, I agreed that the Committee should, in session, consider policy issues. The ARC, during their June 20-22, 1988 meeting discussed those policy issues and interacted with representatives of the three sponsoring agencies. In addition, the Committee reviewed the one request before them that represented an international exchange.

In reaching recommendations, the ARC recognized that a policy on international exchange should be in accord with the Memorandum of Agreement among NSF, NOAA and ONR as well as with policy concerning national oceanographic facilities.

We understand that the priorities for use of ALVIN are as follows:

- | | |
|-----------------|---|
| Priority One: | Use by the three sponsoring agencies, within the basic agreement, which is at present 150 days. |
| Priority Two: | Use by the three sponsoring agencies over and above the basic agreement, and |
| Priority Three: | Use by other agencies, institutions, foreign governments, etc. |

Within these priorities, the ARC would:

- review all requests for ALVIN use, including international requests;
- make their recommendations on international exchange requests as part of the program exceeding tri-agency requirements, and
- support the strongest program available.

The ARC requests that they be notified in advance of any international request which, because of supporting agency policy could not be granted. In those cases, ARC would decline to review the request and would return it.

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

**EAST COAST SHIP SCHEDULING GROUP
WEST COAST SHIP SCHEDULING GROUP
Report of Joint Meeting
October 27, 1988**

**Board Room
American Institute of Architects
1735 New York Avenue N.W.
Washington, D.C.**



East Coast Ship Scheduling Group
West Coast Ship Scheduling Group
Report of Joint Meeting
October 27, 1988
Board Room
American Institute of Architects
1735 New York Avenue, N.W.
Washington, D.C.

East and West Regional Ship Scheduling Groups met at 1 p.m. October 27, 1988 in the Board Room, American Institute of Architects, Washington, D.C. The meeting was called and chaired by George Shor, West Coast Scheduling Group. All eighteen operating institutions were represented.

Notification of the meeting, agenda and requests for scheduling, operating and cost information were by UNOLS Office letter dated October 13, 1988 (Appendix I) and a series of telemail requests for costs and schedules addressed to SCHEDULERS.WEST and SCHEDULERS.EAST.GULF. The objectives of the meeting were: to reach firm, effective schedules for 1989, to assure that all funded science was accommodated and to budget total fleet operations within agency estimates of total funds available. Most of the work of verifying science funding for scheduled projects, resolving scheduling conflicts, accommodating the few funded science projects not scheduled and resolving double bookings was completed by telephone/telemail prior to the meeting or in informal session just prior to the regular meeting.

Despite a strong effort to assemble cost and scheduling information prior to the meeting and cooperation from operating institutions, information from some institutions was submitted as late as October 25, and some was revised even during the October 27 meeting. Late submissions were in consequence of generally low funding levels for 1989 and lingering uncertainty concerning the funding status of a few science projects. Uncertainties notwithstanding, information on science project funding status and on funds available for 1989 ship operatives was better organized and more effectively disseminated than in most years.

Summaries by ship of days of operation and projected costs for 1988 and 1989 had been prepared and were distributed at the meeting. The versions herein (Appendix II), dated November 15, reflect changes agreed to at or shortly after the meeting.

Before hearing schedule presentations from individual institutions, Don Heinrichs was introduced to report on recent personnel changes in Ocean Sciences Division, NSF. Don Heinrichs is Director, Ocean Sciences Division (replacing Grant Gross, who is on sabbatical). Don

introduced Bruce Malfait, Acting Head, OCFS; Al Sutherland, Associate Program Director, Ocean Drilling; Larry Clark, Acting Program Manager, Operations (in addition to his regular duties as Program Manager, Oceanographic Technology); Dick West, Program Manager, Oceanographic Facilities and Lisa Lynch, Oceanographic Facilities Specialist working mainly on ship operations. Tom Forham, DPP and Tom Spence, OSRS were also introduced. Don Heinrichs reported that hiring a permanent Program Manager, Ship Operations was in process, with an end-of-year target.

Fleet schedules and costs for 1989. Brief presentations were made by individual institutions. Science funding decisions have been made for all schedules presented here.

Alpha Helix. Scheduled for 186 days, mostly in the Bering Sea. After shipyard inspection and maintenance (January-March) the season is mainly in the Bering Sea (Ice Edge, ISHTAR, marine mammals) together with GARS in Gulf of Alaska. Two DPP funding decisions were still pending. No likely-to-be-funded projects remain unscheduled.

ATLANTIS II. Scheduled for 202 days, beginning with North Atlantic JGOFS sections and buoy deployment (March-June), ALVIN refit trials and certification (July), then ALVIN investigations on MAR and northeast continental margin (August, September). Biannual shipyard overhaul October, November. Minimal ALVIN operations because of very modest request pressure and general science funding strictures.

BARNES. Scheduled for 140 days operation, all in Puget Sound or nearshore Washington, Oregon. Short-duration projects may be fit in as they arise throughout the year.

BLUE FIN. Scheduled to operate primarily as a day boat, off the southeast coast. The 1989 schedule is for 130 days (NSF 75, DOE 55) with the decision still pending on 7 NSF days.

CALANUS. Scheduled for 205 days, January-December, all in Caribbean Islands, Florida Strait and off Jacksonville. Funding not secure for 30 of 116 NSF days.

CAPE HATTERAS. Scheduled for about 190 days, Carolina Shelf to Sargasso Sea and Gulf of Maine. Funded by NSF 95% and state 5%. Open periods January-March and December.

CAPE HENLOPEN. Scheduled for 156 days, in Delaware Bay, off mid-Atlantic coast, Chesapeake Bay and Gulf of Maine. Open period in April. Funding uncertain for 2 projects within NSF's 102 days.

CONRAD. Scheduled for 103 days, in equatorial and north Atlantic, on SEA BEAM, MCS and dredging. Funding 57% NSF, 40% NRL. (CONRAD schedule was abbreviated for April return

to L-DGO for lay-up after preliminary decision to acquire BERNIER.)

ENDEAVOR. Scheduled for 254 days, in western Atlantic, Greenland Sea, near the Azores, equatorial Atlantic and through the northwest Atlantic. Funding NSF 193 days, ONR 40, DOE 21. The very full high-latitude weather window makes schedule timing critical.

GYRE. Scheduled for 121 days, funded by NSF and state. General oceanography in Gulf of Mexico, Caribbean and western Atlantic. Openings throughout year.

ISELIN. Schedule is based on 232 days funded by NSF (180) and ONR (52). Work is in the Caribbean and Sargasso (February-July), project AMASED (July-September) and Caribbean, Sargasso and Gulf of Mexico (September-December).

KNORR. Will be in shipyard renovation at least through September. No science operations scheduled.

LAURENTIAN. Scheduled for 70 days (April-September), funded by NSF (50) and state (20), mostly in Lake Michigan.

MELVILLE. Scheduled for 172 days, January-June, funded by NSF (155), ONR (16) and JOI (1). Work begins in south Atlantic (SAVE) and ends near Bermuda prior to shipyard renovation.

MOANA WAVE. Scheduled for 269 days, all NSF. After maintenance and transit to western Pacific, physical transect at 10N (January-May), Sea Marc in Caribbean (June-August), then in south central Pacific (September-October). Regional work after return to Hawaii.

FRED H. MOORE. Operable but out of service in 1989.

NEW HORIZON. Schedule has been refined to 215 days, NSF 84, ONR 31, NOAA 31, state 69. Work is California-regional except for RUM vehicle work in north central Pacific (May).

OCEANUS. Scheduled for a strong 262-day schedule, beginning in the tropical Atlantic (January-March) northward to north Atlantic and Newfoundland Basin (April-June), Sargasso Sea, regional projects and SYNOP (July-September). After overhaul (September-October) projects near Bermuda and Sargasso Sea (October-November). December open. NSF 221 days, ONR 41 days.

OSPREY. Has funding to finish conversion in 1989. Scheduled 30 days operation/operational shakedown in northeast Pacific.

POINT SUR. Scheduled for 162 funded days: NPS 71 days, NSF 53 days, ONR 17 days, MLML 15 days and MBARI 6 days. General oceanography in California region. Overhaul in July.

ROBERT G. SPROUL. Scheduled for 144 days regional general oceanography. Funding from NSF 86, UC 15, ONR 13 and JPL 10. Open for additional regional projects.

THOMAS G. THOMPSON. Will be retired from the UNOLS fleet in late 1988.

RIDGELY WARFIELD. Scheduled for 135 days, (NSF 134) in Chesapeake Bay and (1 project) New York Harbor. Shipyard in September.

THOMAS WASHINGTON. Scheduled for 248 days, beginning with seismic and Sea Beam surveys in the west equatorial Pacific and central Pacific and general oceanography (January-May). After shipyard overhaul (May-July), geology and geophysics in the eastern equatorial Pacific.

WECOMA. Scheduled for a solid 246 days (NSF 194, ONR 52). General oceanography in northeast Pacific.

Additionally, NSF has indicated that **WEATHERBIRD** will be funded for GOFS/JGOFS station and regional survey work near Bermuda.

Summary of 1989 Fleet Costs and Operations. At the July, 1988 Ship Scheduling Meeting, NSF representatives had indicated that their 1989 ship operations funding would be not more than \$26.8 million (see July 11, 1988 Ship Scheduling Meeting Report). The July, 1988 summary of UNOLS institutions projections for NSF ship operations was \$29.6 million. Projections in October, 1988 (see Appendix II) for NSF projects are \$26.2 million. Further refinement may still be necessary, to accommodate refinements to the NSF appropriation (see below), final 1988 expenditures and NSF's outlook for 1990. ONR/Navy funding in 1989 will be for about 486 days and \$3.7 million. This is an increase of about \$650,000 over July, 1988 projections but still falls short of the \$4.3 million level hoped for in July, of the \$6.5-8.5 million that could be available or of the \$6.0 million the Navy spent for 1988 operations. In discussing ONR funding, institution representatives were concerned that the total was so low (even lower than in recent years prior to the availability of \$5.5 million exclusively for academic fleet operations) and wondered if there was a trend toward an even lower level of ONR ship operation funds. ONR representatives noted only that there were "no more science proposals for 1989" and no unfilled requests for academic ship time.

George Shor discussed cost projections, noting that operators had done well in limiting daily costs, even though many ships will have less-than-full schedules. He pointed out, however, that NSF-funded ship operations were reduced to the \$24-26 million target level mainly because of low science demand: NSF-funded (and required) science days in 1989 are about 3,333, a reduction of about 6% from 1988. Further, projects are being supported on smaller ships than in 1988:

Comparison of NSF Expenditures, 1988-1989

	1988			1989			Percent Change Total Cost
	Days	\$/m	Daily Cost	Days	\$/m	Daily Cost	
Class II	1,630	17.588	10,790	931	12.109	13,006	(31%)
Class III	782	6.283	8,035	999	8.214	8,222	31%
Class IV	624	3.861	6,188	744	4.722	6,347	22%
<Class IV	503	995	1,978	659	1.126	1,709	13%
Totals	3,539	28.727	8,118	3,333	26.171	7,862	9%

Total fleet days and costs were reduced from 4,731 days at \$39.007 million to 4,207 days at \$32.654 million, reductions of 11% of days and 16% of costs.

Almost all of the dollar reductions were within the large ships. Only one of the Class II's, MOANA WAVE, has a full schedule. The THOMPSON is retired from the fleet, MELVILLE, KNORR and CONRAD are out of operation for much (or all) of the year, ATLANTIS II is scheduled well below capacity and WASHINGTON could accommodate additional work.

Schedules for intermediate ships include about 5% more total days, at a cost increase of about 8%.

Small (Class IV) ships have 6% more days at a cost increase of about 8%. Ships smaller than Class IV have 43% more days at a cost increase of 26%.

George Shor noted that, in light of indications that the BERNIER would be acquired in 1989 together with uncertainties in CONRAD's schedule for the last half of 1989, the CONRAD should return to home port in about April, 1989. L-DGO representatives agreed that, with acquisition of BERNIER, CONRAD should be retired early in 1989. Thus, there were no Scheduling Chair's recommended layoffs.

There were no definitely-funded projects not accommodated within 1989 schedules.

Information from Funding Agencies. Larry Clark presented NSF budget projections for 1989 (see following table):

**ESTIMATED SHIP OPS FY1989
NSF, \$M**

	FY 88	FY 89
OFS, OPS	\$25.8	\$26.5
ODP	+ 1.3	+ 1.5
	-----	-----
	27.1	28.0
 `89 FUNDS USED IN `88	 + 4.0	 - 4.0
	-----	-----
TOTAL AVAIL.	31.1	24.0

PROVIDES DEFICIT CANCELATION

Note that July, 1988 estimates of NSF ship operations funds available in 1989 were about \$26.8 million. (Differences are that in July it was anticipated that only \$3.3 million in 1989 funds would be used for 1988 operations, and in the October, 1988 recapitulation, no 1990 funds are explicitly made available for 1989.)

NSF representatives indicated that the fleet estimate for 1989 ship operations supported by NSF were workable. (Further negotiation can be expected, however.)

Larry Clark alerted ship schedulers that language in NSF's appropriation for 1989 protected ocean sciences (for which there are both advantages and disadvantages) and also prescribed ocean engineering in the Pacific Basin. The NSF/OCE brochure on Current Ocean Science and Technology provides a basis for a Pacific Basin project.

The group was also advised that the National Science Board had approved an award of \$5.4 million over three years to WHOI for an accelerator mass spectrometer center.

Profiles of funding cycles for 1988 and 1989 ship operations costs are Appendix III.

A calendar for scheduling meetings to be held in 1989 was discussed. It was agreed that, given NSF's expected schedule for review panels (only two panels in 1989), scheduling meetings should be held in late June, early July and in the first half of October. (Date for the October meeting should be coordinated with other UNOLS meetings; the June-July meeting is independent. Definite dates will be set

and announced soon. Preliminary regional scheduling meetings are encouraged.

The Ship Scheduling Meeting was adjourned at 4:30 p.m.

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

An association of institutions
for the coordination and support
of university oceanographic facilities

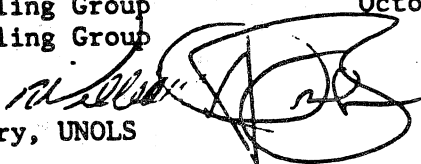
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195
(206) 543-2203

To: East Coast Scheduling Group
West Coast Scheduling Group

From: William D. Barbee
Executive Secretary, UNOLS

Subject: Scheduling Meeting, October 27, 1988

October 13, 1988



A meeting of the UNOLS Ship Scheduling Groups has been called:

Board Room
American Institute of Architects
1735 New York Ave. N.W.
Washington, D.C.
October 27, 1988.

The Group meeting will be called at 1 p.m., and is expected to be concluded by 5 p.m. The Board room will, however, be available beginning at 8:30 a.m. for individual or small group meetings to resolve scheduling conflicts, check funding status of individual projects.

The objectives of the meeting are: to reach firm, effective schedules (the schedules to be used for Ship Ops Proposals due November 1), to assure that funded investigators are accommodated, and to match totals of estimated operations costs with agency funding levels. If the fleet schedule or the schedule of individual ships must be significantly adjusted to satisfy operational or funding constraints, the Chairmen will work with the Group to develop recommendations to be presented to UNOLS on October 28.

Materials for meeting:

1. **Ship Schedules for 1988 and 1989.** All institutions should have submitted up-to-date schedules to SCHEDULERS.WEST.EAST.GULF, and they should be on bulletin boards. Bring copies of what you want, for your own use, including vu-graphs for your 89 presentation.
2. **Cost information for 1988 and 1989.** Summaries of 1988 and 1989 costs dated July 29, 1988 are attached to this letter. Up-to-date summaries based on your responses to October 4, 1988 teletype will be furnished at the meeting. Just bring your own cost information, especially if you have not responded to the October 4, 1988 request.
3. **Summary of Unfilled 1989 Ship Time Requests.** There shouldn't be any, but list any valid request that you don't know positively is scheduled. (10 copies please.)
4. **Table and Budgets from 1989 Ship Operations Proposals.** The October 4, 1988 teletype from UNOLS Office requested copies of Table 1C, Ship Time Costs per Project and Section 12, Detailed 4 year Budgets from your 1989 Ship Ops Proposals. If you have not yet furnished these, please bring at least 10 copies.

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

AGENDA

East and West Coast Ship Scheduling Meeting

Board Room

American Institute of Architects

1735 New York Avenue N.W.

Washington, D.C.

1 p.m.

Thursday, October 27, 1988

The Scheduling Group will be called into session by Chairman Shor and Rawson at 1 p.m. (The Board Room, American Institute of Architects will be available to Ship Schedulers beginning at 8:30 a.m., for those who may need small group meetings to refine schedules, check on science funding decisions, etc.) Emphasis during the afternoon meeting will be on projecting agency funding, matching with cost estimates and refining ship schedules/requirements for 1989.

Fleet Schedules for 1989 - Individual presentations by institution of their operating schedules for 1989. (These schedules should be as furnished to SCHEDULERS.WEST or EAST.GULF, and as you plan for use in Ship Operations Proposals.) Identify schedule problems for individual ships, gaps, long transits, too many/too few days, requests not accommodated, double bookings.

Institution representatives need not bring multiple copies of their schedules (or cost information) so long as they have already responded to October 4 telemail request for information. They may want to bring vu-graphs to help their presentations.

Summary of 1989 Fleet Costs - Chairman Shor, Rawson will present a summary of institution estimates of fleet costs (based on estimates submitted in response to UNOLS Office telemail request of October 4, 1988).

1989 Schedule Refinement - Chairmen Rawson and Shor will moderate discussion and negotiation to improve schedules. Address schedule problems identified earlier, accommodate all users, improve schedule efficiency. Based first on fleet schedule effectiveness, also on cost-funding match, as necessary.

Information from Funding Agency Representatives - From NSF, ONR and others as desired, on funding available for 1989 Ship Operations, funding decisions on individual science projects, overall funding balance and fleet management.

Chairmen's Summary - Characterization of fleet schedule for 1989, to include any schedule refinements necessary to accommodate funded projects, improve effectiveness, meet funding level. The Chairmen will develop with the Group those scheduling recommendations to be presented to UNOLS membership at their October 28 meeting.

Scheduling Meetings in 1989 - Fix the 1989 calendar of scheduling meetings best suited to UNOLS institution needs, science panel schedules and ship ops proposal deadlines.



SHIP/CLASS	PROPOSED FUNDING							
	NSF		ONR		OTHER		TOTAL	
	Days	Dollars	Days	Dollars	Days	Dollars	Days	Dollars
MELVILLE	147	1,798	52	636	10	122	209	2,556
KNORR	279	2,878	23	237	0	0	302	3,115
ATLANTIS II	259	2,885	50	557	37	412	346	3,854
CONRAD	274	3,508	73	935	4	51	351	4,494
T.G. THOMPSON	121	1,546	7	92	0	0	128	1,638
T. WASHINGTON	269	2,673	59	586	3	30	331	3,289
MOANA WAVE	281	2,300	0	0	19	155	300	2,455
CLASS II TOTAL	1,630	17,588	264	3,043	73	770	1,967	21,401
AVE: (7)	233	2,512	38	435	10	110	281	3,057
ENDEAVOR	143	1,200	30	221	49	360	222	1,781
OCEANUS	149	994	85	567	0	0	234	1,561
GYRE	10	60	0	99	124	546	134	705
ISELIN	164	1,408	62	532	1	9	227	1,949
NEW HORIZON	106	774	16	117	98	716	220	1,607
FRED MOORE	32	150	0	0	0	163	32	313
OSPREY	0	200	0	0	0	750	0	950
WECOMA	178	1,497	57	479	0	0	235	1,976
CLASS III TOTAL	782	6,283	250	2,015	272	2,544	1,304	10,842
AVE: (7)	112	898	36	288	39	363	186	1,549
POINT SUR	42	273	84 ^a	546 ^a	15	97	141	916
CAPE HATTERAS	137	900	44	289	21	138	202	1,327
ALPHA HELIX	195	1,436 ^c	0	0	4	29	199	1,465
R. SPROUL	121	476	25	98	15	59	161	633
CAPE HENLOPEN	19	224	0	0	37	437	56	661
R. WARFIELD	110	552	0	0	4	20	114	572
CLASS IV TOTAL	624	3,861	153	933	96	780	873	5,574
AVE: (6)	104	644	26	156	16	130	146	929
BLUE FIN	56	115	0	0	34	70	90	185
LAURENTIAN	40	160	0	0	10	40	50	200
BARNES	49	139	1	1	18	33	68	173
CALANUS	108	261	16	39	5	12	129	312
WEATHERBIRD	250	320	0	0	0	0	250	320
< CLASS IV TOTAL	503	995	17	40	67	155	587	1,190
AVE: (5)	101	199	3	8	13	31	117	238
FLEET TOAL:	3,539	28,727	684	6,031	508	4,249	4,731	39,007

a. Includes 69 days, \$449K for NPS (CNOC).

b. From 29 July 88 Summary.

c. Includes 236K supplement

SHIP/CLASS

PROPOSED FUNDING

	NSF		ONR		OTHER		TOTAL	
	Days	Dollars	Days	Dollars	Days	Dollars	Days	Dollars
MELVILLE	155	1,872	16	193	1	12	172	2,078
KNORR	0	286	0	0	0	0	0	286
ATLANTIS II	184	3,634	3	60	15	296	202	3,990
CONRAD	87	1,067	43	528	3	37	133	1,632
T.G. THOMPSON	0	0	0	0	0	0	0	0 ^b
T. WASHINGTON	236	2,790	10	118	2	24	248	2,932
MOANA WAVE	269	2,460	0	0	0	0	269	2,460
CLASS II TOTAL	931	12,109	72	899	21	369	1,024	13,378
AVE: (5)	186	2,422	14	180	4	74	205	2,676
ENDEAVOR	209	1,621	40	310	21	163	270	2,095
OCEANUS	221	1,778	41	330	0	0	262	2,108
GYRE	81	450	0	0	40	224	121	674
ISELIN	180	1,558	52	450	0	0	232	2,008
NEW HORIZON	84	680	31	251	100	810	215	1,742
FRED MOORE	0	0	0	0	0	0	0	0
OSPREY	30	485	0	0	0	580 ^d	30	1,065
WECOMA	194	1,642	52	440	0	0	246	2,082
CLASS III TOTAL	999	8,214	216	1,781	161	1,777	1,376	11,774
AVE: (7)	143	1,173	31	254	23	254	197	1,682
POINT SUR	53	329	88 ^a	546 ^a	21	130	162	1,004
CAPE HATTERAS	179	1,267	0	0	11	78	190	1,344
ALPHA HELIX	185	1,494	0	0	1	8	186	1,502
R. SPROUL	91	379	25	104	25	104	141	587
CAPE HENLOPEN	102	573	49	275	5	28	156	877
R. WARFIELD	134	680	0	0	1	5	135	685
CLASS IV TOTAL	744	4,722	162	925	64	353	970	5,999
AVE: (6)	124	787	27	154	11	59	162	1,000
BLUE FIN	73	124	0	0	55	93	128	217
LAURENTIAN	50	192	0	0	20	77	70	269
BARNES	170	253	2	2	12	22	184	277
CALANUS	116	237	34	70	55	113	205	420
WEATHERBIRD	250	320	0	0	0	0	250	320 ^c
< CLASS IV TOTAL	659	1,126	36	72	142	305	837	1,503
AVE: (5)	132	225	7	14	28	61	167	301
FLEET TOTALS	3,333	26,171	486	3,677	388	2,804	4,207	32,654

a. Includes 71 days/440K NPS (CNOC)

b. TGT out of service in 1989.

c. From 29 July summary.

d. Final conversion funds provided by USC.

PROFILES OF FUNDING CYCLES \$ MILLION
1988 Ship Operations

	OP DAYS	NSF	ONR	OTHER	TOTAL	SHORT FALL
1986	4,259	25.7	4.4	3.4	33.5	
1987	4,763	28.0	5.7	4.0	37.8	
1988 Cost Projections						
July 1987 (anticipated)	5,540	35.6 (30.4)	5.4 (8.5)	2.9 (2.9)	43.9 (41.4)	(1.6)
October 1987 (anticipated)	5,406	32.3 28.4	5.2 5.2	4.5 4.5	41.9 38.1	(3.8)
January 1988 (anticipated)	5,015	29.1 (28.4)	4.7 (4.7)	4.0 (4.0)	37.9 (36.7)	(1.2)
July 1988 (anticipated)	4,902	29.1 (30.4)	6.1 (6.1)	4.2 (4.2)	39.4 (40.7)	
October 1988 (anticipated)	4,731	28.7 (28.7)	6.0 (6.0)	4.2 (4.2)	39.0 (39.0)	

SHIP OPERATIONS
SUMMARY OF 1989 PROJECTIONS
\$ MILLION

	NSF		ONR		OTHER		TOTAL	
	Days	\$	Days	\$	Days	\$	Days	\$
July 1988	3,798	29.55	426	3.44	358	1.90	4,582	34.89
(Anticipated)		26.8		4.3		1.9		33.4
Projected Shortfall		(2.7)		0.9		-		(1.8)
October 1988	3,333	26.17	486	3.68	388	2.80	4,207	32.65
(Anticipated)		24.0-26.0		3.68		2.80		32.65
Projected shortfall		?		(-)		(-)		(-)

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

October 1988

UNOLS Nominating Committee

The UNOLS Nominating Committee has assembled the following slate of candidates for UNOLS and Advisory Council positions to be filled at the October 1988 Annual Meeting.

The Slate

For UNOLS Chair

George H. Keller (incumbent)	Oregon State University
Art Maxwell	University of Texas, Austin

For UNOLS Vice Chair

Peter Betzer	University of South Florida
Jeff Fox	University of Rhode Island
Tom Johnson	Duke University Marine Laboratory
Carolyn Thoroughgood	University of Delaware

For Advisory Council - Member Representation

Gary Brass	University of Miami, RSMAS
Jeff Fox	University of Rhode Island
David Karl	University of Hawaii
Karen Wishner	University of Rhode Island

For Advisory Council - Associate Member Representation

Larry Atkinson	Old Dominion University
Sallie Chisholm	M.I.T.



Larry P. Atkinson, Oceanography
Smith Professor of Oceanography
Old Dominion University
Boundary current - shelf water interaction.

Peter Betzer, Geochemistry
Professor, Dept. of Marine Science
University of South Florida
Sedimentology, Phytoplankton, Mineralogy.

Gary Brass, Geochemistry
Professor & Chairman, Division of Marine Geology and Geophysics
University of Miami, Rosenteil School of Marine and Atmospheric Sciences
Paleoceanography and circulation and geochemistry of the mezezoic ocean.

Sallie W. Chisholm, Biological Oceanography
Professor, Director, MIT-WHOI Joint Program of Oceanography
Massachusetts Institute of Technology
Phytoplankton ecology, open ocean.

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

Thomas C. Johnson, Marine Geology
Director, Duke/UNC Oceanographic Consortium
Associate Professor of Geology, Duke University
Duke University Marine Laboratory
Sedimentary processes in large lakes and oceans.

David M. Karl, Biological Oceanography
Professor of Oceanography, Department of Oceanography
Chair, Oceanic Biology in HIG, University of Hawaii
Marine microbiological ecology, partical bacterial interactions
and deepsea hydrothermal vents.

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.

Arthur Maxwell, Oceanography Geophysics
Director, Institute for Geophysics
University of Texas, Austin
Geophysics, currents and circulation, structural geology/tectonics.

Wilton Tony Sturges, Physical Oceanography
Professor of Physical Oceanography
Florida State University
Ocean circulation; Caribbean Sea and Gulf of Mexico; Mixing in
bottom currents.

Karen Wishner, Biological Oceanography
Associate Professor, University of Rhode Island
Zooplankton ecology in the deep sea, water column and benthic
boundary layer.

SUMMARY OF 1987 CLEARANCE REQUESTS

	<u>SHIP</u>	<u>COUNTRY(S)</u>	<u>RESEARCH PERIOD</u>
87-01	CATSPAW	Bahamas	April 1987
87-02	WESTWARD	U.K. (Bermuda)	April-May 1987
87-03	SPROUL ^{1/}	Mexico	July-August 1987
87-04	ALBATROSS IV	Canada	March-May 1987
87-05	RESEARCHER ^{2/}	Bahamas Antigua & Barbuda Dominica France (French Guiana Guadeloupe & Martinique) St. Lucia St. Vincent & The Grenadines Barbados	March 1987
87-06	ALVIN/ATLANTIS II	Japan	July-August 1987
87-07	CAPE HATTERAS	Bahamas	March 1987
87-08	NOAA Aircraft	Japan Taiwan Philippines	May-June 1987
87-09	JORDAN MCARTHUR	Mexico Guatemala Costa Rica Panama Colombia Ecuador ^{3/} Peru ^{3/} France (Clipperton Is.)	July-December 1987
87-10	DELAWARE II	Canada	April 1987
87-11	RESEARCHER	Kiribati	May-June 1987
87-12	MOANA WAVE	Chile	October-November 1987
87-13	PACIFIC STATES I ^{4/}	Mexico	September-October 1987
87-14	HARKNESS	U.K. (Diego Garcia)	April 1987-April 1990
87-15	Collection Permit (Schultz)	Mexico ^{5/}	February 1988- August 1989

87-16	FARNELLA	Canada	March-April 1987
87-17	FARNELLA	Bahamas	April-May 1987
87-18	ENDEAVOR	Canada	April, July-August, September 1987
87-19	CONRAD ^{6/}	Spain	September-October 1987
87-20	SEDCO	Mauritius ^{7/} UK (Chagos Is.) Maldives Seychelles	May-June 1987
87-21	NOAA Aircraft	Japan Philippines	May-June 1987
87-22	WESTWARD	Canada U.K. (Bermuda)	May-July 1987
87-23	Marine Mammal Research (Heath)	Mexico	June-August 1987
87-24	MOANA WAVE	Peru	July 1987
87-25	MOANA WAVE	Chile	November-December 1987
87-26	MOANA WAVE ^{8/}	France Clipperton Is.	June-July 1987
87-27	FRED H. MOORE	Japan	July 1987
87-28	FRED H. MOORE	Japan	June-July 1987
87-29	FRED H. MOORE ^{9/}	Indonesia	October 1987
87-30	Collection Permit (UETZ)	Mexico ^{10/}	July-November 1987
87-31	PACIFIC CLIPPER (Charter)	Mexico ^{11/}	August-November 1987
87-32	CALANUS	Belize	May-June 1987
87-33	SEDCO	Oman ^{12/}	August-October 1987
87-34	FRED H. MOORE	Indonesia ^{13/}	September-October 1987
87-35	IDA-Z (Charter)	Dominica	April-May 1987

87-36	Collection Permit (Rasch)	Mexico ^{14/}	April-July 1988
87-37	MOANA WAVE	Peru Chile	July-August 1987
87-38	MOANA WAVE	Indonesia ^{15/}	January 1988- October 1989
87-39	RESEARCHER	Brazil Barbados France (Fr. Guiana) Antigua & Barbuda St. Kitts/Nevis Bahamas Guyana Suriname ^{16/} UK (Turks & Caicos Is)	September 1987
87-40	GYRE	Mexico ^{17/}	October-November 1987
87-41	DELAWARE II	Canada	May-June 1987
87-42	ALBATROSS IV	Canada	June 1987
87-43	RESEARCHER	Peru ^{18/}	June-August 1987
87-44	MCARTHUR	Canada	May 1987
87-45	Marine Mammal Research (Tershy)	Mexico ^{19/}	August 1987- February 1988
87-46	LAURENTIAN	Canada	May-June 1987
87-47	WESTWARD	Canada	July-August 1987
87-48	GOOD FORTUNE	Bahamas	April-May 1987
87-49	CALANUS	Belize	June 1987
87-50	THOMAS WASHINGTON	Ecuador ^{20/}	October-December 1987
87-51	POINT SUR	Canada	September 1987
87-52	CAPE HATTERAS	UK (Bermuda)	June-July 1987
87-53	MOANA WAVE	Papua New Guinea Indonesia ^{21/} Philippines Palau	June-July 1988

87-54	ALVIN/ATLANTIS II	Canada	October 1987
87-55	MELVILLE	France (Marquesas Is.) UK (Pitcairn Is.) Chile (Easter Is.)	October-December 1987
87-56	NOAA Aircraft ^{22/}	Mexico	September-October 1987
87-57	CAPE HENLOPEN ^{23/}	UK (Bermuda)	June-July 1987
87-58	KILA	Kiribati ^{24/}	June-July 1987
87-59	KNORR	Brazil	December 1987- January 1988
87-60	OSPREY (Charter)	Bahamas	June-July 1987
87-61	WESTWARD	Bahamas Antigua & Barbuda St. Kitts/Nevis UK (Bermuda, Montserrat) France (St. Barts, Guadeloupe, Martinique) Netherlands (St. Maarten) ^{25/} Dominica St. Vincent St. Lucia Grenada	October-November 1987
87-62	WESTWARD	Bahamas St. Kitts/Nevis UK (Montserrat) France (Guadeloupe, Martinique) Dominica St. Lucia St. Vincent Grenada Venezuela ^{26/} Colombia Honduras Mexico	December 1987- January 1988
87-63	WESTWARD	Bahamas Haiti Jamaica Colombia ^{27/} Honduras ^{27/} Mexico	February-March 1988

87-64	STARELLA	Mauritania Senegal Gambia Guinea-Bissau Guinea Sierre Leone Liberia Ivory Coast Ghana ^{28/}	June-November 1987
87-65	MELVILLE	UK (Pitcairn Is.) France (Marquesas Is.)	September-October 1987
87-66	NOS Hydrographic Surveys	Canada ^{29/}	May-September 1987
87-67	CONRAD	Chile	January 1988
87-68	DELAWARE II	Canada	June 1987
87-69	Baja Explorer (Mexican)	Mexico	November-December 1987
87-70	ALBATROSS IV	Canada	July-August 1987
87-71	KNORR	Iceland Norway Denmark	July-August 1987
87-72	FRED MOORE	Japan	August 1987
87-73	Collection Permit (Carr)	Mexico ^{30/}	July-August 1987
87-74	Marine Scientific Research (Spieler)	Mexico ^{31/}	March-April 1988
87-75	DELAWARE II	Canada	July 1987
87-76	DISCOVERER	Canada	July-September 1987
87-77	DELAWARE II	Canada	July 1987
87-78	POWELL (Charter)	Canada	July 1987
87-79	OCEANUS ^{32/} ENDEAVOR	UK (Bermuda)	June, October 1987
87-80	Archaeological Research (Brigham)	Mexico ^{33/}	July-August 1987

87-81	OCEANOGRAPHER	France (Clipperton Is.)	October-November 1987
87-82	DELAWARE II	Canada	August-September 1987
87-83	ALBATROSS IV	Canada	September-November 1987
87-84	GYRE	Mexico ^{34/}	November-December 1987
87-85	NEREID LUCKY SEVEN	Canada	July-October 1987
87-86	Research Permit (Horovitz)	Mexico ^{35/}	July-August 1987
87-87	SEDCO	Australia France	December 1987- April 1988
87-88	CAPE HATTERAS	UK (Bermuda)	September 1987
87-89	JOHN ISAACS	Canada	August-September 1987
87-90	GLORIA MICHELLE	Canada	August 1987
87-91	FRED H. MOORE	Nauru ^{36/} Kiribati Marshall Is. Fed. States of Micronesia	October-December 1987
87-92	Collection Permit (Aldridge)	Mexico ^{37/}	November 1987- November 1989
87-93	ALVIN/ATLANTIS II	Mexico	January-February 1988
87-94	OCEANUS	Portugal (Azores)	November 1987
87-95	NSF Aircraft	Canada Spain ^{38/} Portugal West Germany	November-December 1987
87-96	Marine Mammal Research (Tershy)	Mexico ^{39/}	October 1987- January 1988
87-97	LYNCH ^{40/}	Spain Morocco	October-November 1987
87-98	KANE	Norway	September-October 1987

87-99	STARELLA	Ghana Nigeria Cameroon Equatorial Guinea Gabon Congo	October-November 1987
87-100	STARELLA	Venezuela Haiti Trinidad-Tobago Netherlands (Antilles)	November 1987- February 1988
87-101	XIANGYANGHONG-14 (PRC)	Indonesia ^{41/} Nauru Solomon Is.	September-October 1987
87-102	DELAWARE II	Canada	September-October 1987
87-103	KANE	Norway	September 1987
87-104	CORAL REEF II (Charter)	Bahamas	November 1987
87-105	DESTEIGUER	Mexico ^{42/}	February-March 1988
87-106	Marine Mammal Research (Cole)	Mexico	February 1988
87-107	KNORR	Liberia Ivory Coast Ghana ^{43/} Gabon ^{43/} Congo ^{43/} Zaire ^{43/} Angola ^{43/}	November 1987- March 1988
87-108	CONRAD ^{44/}	Chile Argentina	February-March 1988
87-109	THOMAS WASHINGTON	Mexico ^{45/}	March-April 1988
87-110	CONRAD ^{46/}	Brazil UK (Ascension Is.)	April-May 1988
87-111	DELAWARE II	Canada	November-December 1988

87-112	GYRE ^{47/}	Honduras Panama Colombia Haiti Dominican Republic Jamaica Venezuela	March 1988
87-113	CAPE HATTERAS	Honduras Colombia ^{48/} Jamaica	May 1988
87-114	KNORR	Turkey	April-August 1988
87-115	CAPE HATTERAS	Jamaica Colombia ^{49/} Honduras ^{49/}	April 1988
87-116	NAI'A II	Mexico ^{50/}	March-June, October-November 1988
87-117	CONRAD ^{51/}	Brazil	May-June 1988
87-118	DELAWARE II	Canada	January-February 1988
87-119	Collection Permit (Emberton)	Mexico ^{52/}	April-May 1988
87-120	GYRE ^{53/}	Costa Rica Panama Colombia Ecuador	January-March 1988
87-121	COLUMBUS ISELIN	Bahamas Dominican Republic Grenada Venezuela ^{54/} Haiti ^{55/} France St. Kitts/Nevis Dominica ^{55/} St. Lucia ^{55/} St. Vincent ^{55/} Jamaica UK (Turks & Caicos Is., Montserrat)	February-March 1988
87-122	Collection Permit (Turner)	Mexico ^{56/}	February-August 1988

87-123	MILLER FREEMAN	Canada	January 1988
87-124	BARTLETT ^{57/}	Costa Rica	December 1987 - February 1988
87-125	THOMAS WASHINGTON	USSR ^{58/}	August-September 1988
87-126	KNORR	Spain ^{59/} Greece	March-April 1988
87-127	WHITING	Bahamas UK (Turks & Caicos) ^{60/} St. Kitts/Nevis ^{60/} France (Fr. Guiana, Martinique, Guadeloupe) ^{61/} Dominica ^{60/} St. Lucia ^{60/} St. Vincent ^{62/} Barbados ^{62/}	February-March 1988
87-128	COLUMBUS ISELIN	Venezuela	April-May, September-October 1988
87-129	WHITING ^{63/} MT. MITCHELL	Brazil ^{65/} Bahamas Barbados UK (Turks & Caicos) ^{64/} St. Vincent ^{64/} Guyana ^{65/} France (Fr. Guiana) ^{65/} Antigua and Barbuda ^{66/}	June-July 1988 September-October 1988
87-130	STARELLA ^{67/}	Dominican Republic	February-March 1988
87-131	MOANA WAVE	Philippines ^{68/}	March-April 1988
87-132	Marine Mammal Research	Mauritania ^{69/}	January-March 1988
87-133	OCEANUS	Iceland	July-August 1988
87-134	MT. MITCHELL ^{70/}	UK (Bermuda) Canada Denmark (Greenland) Iceland Ireland ^{71/} Barbados	July-September 1988

87-135	OCEANOGRAPHER	Kiribati ^{72/} New Zealand (Tokelau)	April-May 1988
87-136	OCEANOGRAPHER	New Zealand (Tokelau) Kiribati ^{72/}	May 1988
87-137	MOANA WAVE	Philippines PRC ^{73/}	August 1988
87-138	SPROUL	Mexico	July-August 1988
87-139	ENDEAVOR	Denmark (Greenland) Norway	July-August 1988
87-140	ALBATROSS IV ^{74/}	Canada	February 1988
87-141	DELAWARE II ^{74/}	Canada	February 1988
87-142	ALBATROSS IV	Canada	March-April 1988
87-143	CONRAD ^{75/}	Argentina UK (Falklands)	February-March 1988

The following footnotes indicate specific problems or unusual circumstances regarding clearance requests received during 1987:

- 1) Research cancelled owing to non-response from Mexico.
- 2) NOAA cancelled requests for Dominica, France, St. Lucia, St. Vincent and Barbados prior to approval owing to project revisions.
- 3) Approval could not be obtained from Ecuador. NOAA then cancelled research in Peruvian waters.
- 4) Research cancelled prior to response from Mexico owing to project revisions.
- 5) No response received from Mexico despite repeated requests.
- 6) Research cancelled prior to response from Spain. Sponsors of the research wanted to obtain clearance through cooperating Spanish agency.
- 7) ODP drilling not approved by Mauritius.
- 8) Chief scientist said clearance not required. Research conducted at least 200 miles from Clipperton Is. to avoid seeking clearance.
- 9) Cancelled due to lack of funding.
- 10) Approved with a fee of 200,000 P. Research not conducted.
- 11) Approved two days late. Research was conducted as proposed on revised schedule.
- 12) Approved after extraordinary efforts on the part of the U.S. Embassy. Dept was asked by ODP to seek clearance when no response was received from direct approach to Embassy of Oman.
- 13) Approval received from Indonesia two weeks after research had been revised to conduct alternative project. It was not possible to revert back to original plans, so Indonesia research was not conducted.
- 14) No response received from Mexico despite repeated requests.
- 15) INSTEP Project was not approved by Indonesia despite major efforts on its behalf by Embassy.
- 16) Research not approved by Suriname.
- 17) Approved two weeks late. Research conducted outside Mexican waters.

- 18) Approved two weeks late. Schedule was adjusted to conduct research.
- 19) No response from Mexico despite repeated requests.
- 20) Approval received a month late. Proposed research was conducted on a revised schedule.
- 21) No response received from Indonesia despite repeated requests.
- 22) Flight clearances for hurricane research outside Mexican jurisdiction.
- 23) Request cancelled after approval owing to lack of funding.
- 24) No response received from Kiribati despite repeated requests.
- 25) No response received from Netherlands Antilles despite repeated requests.
- 26) Request cancelled for Venezuela owing to onerous requirements for clearance.
- 27) No response received from Colombia and Honduras despite repeated requests.
- 28) No response received from Ghana despite repeated requests.
- 29) Approval given on 2 days prior notice by U.S.
- 30) Researcher requested to pay 600,000 P. Researcher conducted research, however did not pay the fee.
- 31) Researcher requested to pay 600,000 P. Research cancelled.
- 32) Research cancelled prior to response from U.K. owing to project revisions.
- 33) No response from Mexico despite repeated requests.
- 34) Denied by Mexico. SRE later approved a month after research was conducted outside Mexican waters when Mexican Navy complained of denial.
- 35) No response from Mexico despite repeated requests.
- 36) Requestor cancelled clearance from Nauru when additional information was requested.

- 37) No response received from Mexico despite repeated request.
- 38) No response received from Spain.
- 39) No response received from Mexico despite repeated request.
- 40) Approvals received with only 2 months notice.
- 41) No response received from Indonesia.
- 42) Approved one week late. Research conducted on a revised schedule.
- 43) Requests cancelled by chief scientist to avoid possibility of having to accommodate more than two participants.
- 44) Research approved despite 6 schedule changes by ship operator.
- 45) Request denied by Mexico, owing to late schedule changes.
- 46) Research approved despite 4 schedule changes by ship operator.
- 47) Research cancelled due to lack of funding.
- 48) Colombian approval received after extraordinary efforts by Embassy.
- 49) Honduran approval received on short notice after denial by Colombia.
- 50) Approved one month late by Mexico. Research conducted on revised schedule.
- 51) Approval received despite shifting from GYRE to CONRAD and 4 schedule changes.
- 52) No response received from Mexico despite repeated requests.
- 53) Research cancelled due to lack of funding.
- 54) Request to Venezuela cancelled owing to onerous clearance requirements.
- 55) No response received from Haiti, Dominica, St. Lucia and St. Vincent despite repeated requests.
- 56) No response received from Mexico despite repeated requests.

- 57) Request cancelled by Navy owing to requirement for AIDS testing problem associated with Costa Rica port call.
- 58) Request approved by USSR; first in many years.
- 59) Spain would not accept request with less than 6 months prior notice; rescheduled for August 1988.
- 60) Requests cancelled for Turks & Caicos, St. Kitts/Nevis, Dominica, St. Lucia, Guadeloupe and Martinique owing to project revisions.
- 61) France denied request owing to conflict with military operations off French Guiana.
- 62) Approval not received until just before ship entered the waters of St. Vincent and Barbados.
- 63) WHITING and MT. MITCHELL substituted for MALCOLM BALDRIGE (RESEARCHER).
- 64) Requests cancelled for Turks & Caicos and St. Vincent owing to project revisions.
- 65) Approvals from Brazil, French Guiana and Guyana received very late owing to change of vessels.
- 66) Barbuda for September-October 1988 leg only.
- 67) Request cancelled prior to response from Dominican Republic owing to lack of funding.
- 68) Philippine approval granted day of departure from Manila.
- 69) No response received from Mauritania; short notice.
- 70) MT. MITCHELL substituted for MALCOLM BALDRIGE.
- 71) Request cancelled for Ireland owing to project revisions.
- 72) No response received from Kiribati despite repeated requests.
- 73) PRC notified of research intentions in South China Sea owing to its nebulous, sweeping claim there.
- 74) Requests cancelled owing to lack of funding.
- 75) Requests cancelled owing to lack of funding.

TOTAL REQUESTS PER COUNTRY - 1987

Canada - 33	Ireland - 1
Mexico - 29	Turkey - 1
Honduras - 5	USSR - 1
Costa Rica - 3	FRG - 1
Panama - 3	Ghana - 3
Belize - 2	Congo - 2
Guatemala - 1	Gabon - 2
Colombia - 7	Ivory Coast - 2
Chile - 6	Liberia - 2
Brazil - 5	Mauritania - 2
Venezuela - 5	Angola - 1
Peru - 4	Cameroon - 1
Ecuador - 3	Equatorial Guinea - 1
Argentina - 2	Gambia - 1
Guyana - 2	Guinea - 1
Suriname - 1	Guinea-Bissau - 1
Bahamas - 14	Maldives - 1
Dominica - 6	Mauritius - 1
St. Vincent - 6	Morocco - 1
Barbados - 5	Nigeria - 1
Jamaica - 5	Oman - 1
St. Kitts/Nevis - 5	Senegal - 1
St. Lucia - 5	Seychelles - 1
Antigua & Barbuda - 4	Sierra Leone - 1
Haiti - 4	Zaire - 1
Dominican Republic - 3	Japan - 6
Grenada - 3	Indonesia - 5
Netherlands Antilles - 2	Kiribati - 5
Trinidad & Tobago - 1	Philippines - 5
United Kingdom - 19	Nauru - 2
France - 13	Tokelau - 2
Norway - 4	Australia - 1
Spain - 4	FSM - 1
Denmark - 3	Marshall Is. - 1
Iceland - 3	Palau - 1
Portugal - 2	PNG - 1
Greece - 1	PRC - 1
	Solomon Is. - 1
	Taiwan - 1

The Department of State received a total of 143 research vessels clearance requests during calendar year 1987. They represent 288 clearance requests to 76 foreign governments for research during 1987-1988.

Thirty-four clearances were denied or otherwise not approved. Research was cancelled, delayed or otherwise disrupted in 20 others owing to untimely approvals or onerous requirements.

In addition, 27 requests were received from 5 foreign governments to conduct research in U.S. waters. All were approved.

The total no. of clearance requests continued to climb during 1987 to 288. The disturbing aspect of marine research in foreign waters is the increasing numbers of projects that are cancelled or otherwise disrupted owing to denials or late or non-response by the coastal state. Although the number of disruptions had been increasing along with the increase in total requests, prior to 1986, the percentage had always been 5-10%. In 1986 the percentage rose to 12 and to 19 in 1987. This is reflective of a trend towards many more problems involved in obtaining clearances and doesn't even take into account the numerous other clearance requests for which much effort must be expended to obtain approval, which in previous years may have been routinely received.