UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

ADVISORY COUNCIL MEETING
June 2, 1986
Joseph Henry Building
National Academy of Sciences
2100 Pennsylvania Avenue NW
Washington, DC

Advisory Council members together with representatives from National Science Foundation, Office of Naval Research, Minerals Management Service, National Oceanic and Atmospheric Administration, observers and UNOLS Office staff met in Room 353, Joseph Henry Building. The meeting was called to order at 8:30 a.m., June 2, 1986 by Council Chairman Charles Miller. The meeting followed the agenda (Appendix I) except as noted.

Attendees

Advisory Council
Charles B. Miller, Chairman
Thomas C. Malone, Vice Chairman
Robertson P. Dinsmore
John Martin
Harris B. Stewart
Robert W. Corell, *ex-officio*
Ferris Webster, *ex-officio*

Unable to Attend
Carl Lorenzen
Arthur Maxwell
Christopher N. K. Mooers

Observers
John Albright, NOAA
Keith Kaulum, ONR
Wes Lovaas, ONR
Hawley Thomas, MMS
Larry Clark, NSF
Grant Gross, NSF
Don Heinrichs, NSF
Mike Reeve, NSF
Richard West, NSF
John Van Leer, U Miami

UNOLS Office
William D. Barbee
Mitch Stebens

Minutes of the February 6, 7 1986 Advisory Council meeting were accepted.

Examine UNOLS Semiannual Meeting Agenda. The Advisory Council reviewed the June 4, 1986 UNOLS meeting agenda item by item, except as noted.

Reviews of **The Chairman's Report and Advisory Council Report to UNOLS** were deferred, pending information to be developed during the Advisory Council Meeting.

ALVIN Review Committee Report. Robert Corell, ARC Chairman, reported on ALVIN Review Committee activities and on ALVIN program status. The ARC had met on May 7, 8, 9, 1986 in Woods Hole to review ALVIN dive requests for 1987, recommend projects to be scheduled, recommend schedules for 1986 and 1987 and consider various program issues.

The ALVIN program is going well, and is helping to produce excellent science. As noted in the review *ALVIN '86*, "It is clear that ALVIN's ability to take human eyes, brains, sampling equipment, and experiments to the deep sea floor has played a uniquely important role in the development of U. S. ocean science during the 1970's and 1980's. It is equally clear that, in general, the ALVIN program is operating effectively, and that many other important scientific problems remain to be solved within ALVIN's present capabilities.

ALVIN/ATLANTIS II had just undertaken and was at sea on the first scientific investigation since completion of a significant ALVIN overhaul and certification. The overhaul, begun in early 1986 had, despite some delay due to engineering and procurement problems, achieved its intended objectives. The overhaul should result in a more effective ALVIN to support science. Operating speed is increased, maneuvering is better, available power will be provided (when total weight problems are worked out), and workload in some categories is increased. A new data logger, easier to maintain and, hopefully more dependable, has been installed.

The ARC refined their recommendations for the 1986 ALVIN/ATLANTIS II operating schedule. The new schedule which accommodates the extended overhaul and certification period together with several modest changes in individual project schedules. The facility will still undertake schedule work in the North Atlantic, Gulf of Mexico, Panama Basin and off California, ending the year in San Diego. Some work earlier projected for 1986 had to be deferred until early 1987.

Based on both earlier and new ARC recommendations a provisional schedule was developed for 1987. The ALVIN/ATLANTIS II would take up work off California in

January. (This work was earlier deferred from the 1986 schedule.) The facility would then begin transit across the Pacific undertaking dive projects near the Hawaiian Islands and in the mid-Pacific enroute. Dive projects in the Mariana region and other Pacific sites would be completed April through August. The ALVIN/ATLANTIS II would then return across the Pacific by a northern route and take up one dive project off the Oregon-California coast during the remainder of the 1987 weather window there. The rest of the operating year would be devoted to recommended projects off the California coast. *The ALVIN Review Committee anticipates that this provisional schedule will hold with but minor perturbations. The schedule is, however, dependent on: the completion without delay of an ambitious set of operations scheduled for 1986, operational and logistics considerations from the W.H.O.I. operating group and the concurrence (based largely on science funding decisions) of the funding agencies NSF, NOAA and ONR.*

No schedule was developed for 1988, even though ARC recommendations for eight projects totaling more than 120 dives remain pending. Three projects are all in the eastern Pacific, from Gorda-Juan de Fuca to the East Pacific Rise. Also, W.H.O.I. operators advise that ALVIN/ATLANTIS II overhaul and maintenance must be scheduled during late 1988. Thus, the most likely schedule for 1988 would be confined almost entirely to the eastern Pacific with a substantial period on Gorda-Juan de Fuca and additional work off California, Mexico, and the EPR and perhaps work in the Atlantic along a Panama-Woods Hole transit. The 1988 schedule will be developed after the spring, 1987 ARC review.

The ARC was concerned that again in 1986, a substantial number of projects and dives rolled over into 1988 (beyond the last year scheduled). The Committee believes that such a backlog is bad for individual investigators, for agency program managers and for the overall ALVIN program. ARC intent is to eliminate backlog during the 1986-87 planning/scheduling cycle. Dive requests will be solicited for 1988 only, and at the 1987 ARC review, requests that cannot be scheduled for 1988 will be tabled.

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

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

Recommended changes in the ALVIN Review Committee. That the ALVIN Review Committee be enlarged, renamed the ALVIN Advisory Committee and establish standing subcommittees for Long Range Planning, Scheduling, and Technology Development. In addition, the committee recommends an annual meeting be held for Principal Investigators of ALVIN-based research projects. This meeting should augment present procedures for obtaining user and community input to ALVIN activities.

Recommendation for a Submersible Science Study. A major Submersible Science Study be sponsored in 1986 with a specific charge to identify: (1) Scientifically important research topics at 0-1000m depths that have been precluded by cost or technological limitations but which now can be attached through newly available technology, and (2) Scientifically important research topics that would be open to effective study from submersibles with depth capability substantially greater than that of ALVIN.

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

The ALVIN Review Committee (ARC) recommends that UNOLS endorse the recommendation of the Special ALVIN Study Committee that the ARC be renamed the ALVIN Advisory Committee (AAC). Further, that the ARC (or AAC) establish two subcommittees, one for long-range planning and the other for technology development. These subcommittees should be composed of members of the ARC (or AAC) and should be established immediately, and be charged with implementing the spirit of the Special Committee (Section III).

The ALVIN Review Committee recommends that UNOLS endorse the recommendation of the Special ALVIN Study Committee , that a special study be initiated for the future of manned and unmanned underwater systems to support ocean sciences (deep and continental shelf) in the 1990's, and that the ARC (or AAC) be charged with the responsibility to develop a charge for such a study, structure the study, appoint/select the individual(s) and/or entities to conduct the study, and work with the three funding agencies to provide funds to support the effort. The study should be initiated as soon as possible and completed in 12-18 months.

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

UNOLS endorse the Special ALVIN Study Committee recommendation concerning subcommittees for ALVIN Review Committee, and ask the ARC to establish subcommittees to address (a) long range-planning, (b) technology development for ALVIN science, and (c) scheduling, and charge

these subcommittees with implementing the spirit of the Special Committee Report. Further, the Advisory Council strongly recommends that the ALVIN Review Committee retain its current name.

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

The ARC Chairman reviewed for the Advisory Council the ARC's *Position Statement on Potential Use of the ALVIN/ATLANTIS II for Operations at the TITANIC site.* Since that statement (reviewed by the Advisory Council at its February 6, 7, 1986 meeting), the Navy has responded to the ARC, stating their intent to sponsor ALVIN operations at the TITANIC site. Principal Investigators have worked with ALVIN operators to develop a cruise plan for investigations at the TITANIC, and the cruise was scheduled for July, 1986. Plans for the engineering development investigation have been developed in an open process among investigators, Navy sponsors and WHOI operators.

ALVIN Review Committee recommendations for new appointments to the ARC are:

> *James Eckman, Biological Oceanographer, Skidaway Institution of Oceanography*
>
> *Daniel Karig, Geology and Geophysics, Cornell University (incumbent).*

The Advisory Council endorsed those recommendations.

International Restrictions on Ocean Science Committee (IROSC) Report. Harris B. Stewart, Jr., IROSC Chairman, reported that the *Handbook for International Operation of U. S. Scientific Research Vessels*, prepared for UNOLS by Lee R. Stevens was ready for distribution. (The Handbook will be distributed to Federal Agencies by the National Science Foundation and to UNOLS institutions and the oceanographic community at large by the UNOLS Office.) The Handbook discussed zones of jurisdiction as guidance as to where consent is required for ocean research, and describes those research activities for which consent is required. The Request for Clearance process is described with emphasis on the channels for requests, responsibilities of investigators and operating institutions, foreign participation and international collaboration, and post cruise obligations.

The Handbook should be of significant aid to investigators and operators alike, both in the clearance request process and in conducting research in areas of foreign jurisdiction.

At their February, 1986 meeting the Advisory Council had requested that Harris Stewart, with IROSC, conduct a survey of UNOLS institutions that would help define problems now experienced in obtaining clearances of foreign research. Dr. Stewart had undertaken such a survey; and presented *A Report on Problems Encountered by the UNOLS Ship-Operating Institutions in Obtaining Clearances to Work in Waters Under Foreign Jurisdiction* (Appendix II). The report was a preliminary one, because all institutions had not yet responded, and key officials in the Federal agencies had not yet been consulted. Based on the returns to date, denials of clearance requests were not an overriding problem. Only eight of 131 requests during 1984 and 1985 were denied. However, delays in the clearance request process and the untimely (late) receipt of clearances is a serious problem. Returns to the poll frequently cited instances wherein clearances were received only a few weeks or days prior to the scheduled time of the research investigation. Information from responding institutions sometimes implied problems of lack of communication within the clearance process. (Instances were cited wherein problems on individual clearances were not promptly communicated to investigators or operators.) The report also demonstrated that, especially since the Law of the Sea regime has defined the clearance request process for most foreign research, the workload had increased dramatically. A more efficient system is needed to cope with clearance requests.

The sense of the Advisory Council was that the IROSC report represented a good start in defining problems. Returns should be collected from the remaining six institutions and consultations should be held with key agency officials as a further basis for Advisory Council recommendations concerning UNOLS actions toward solution.

UNOLS National Expeditionary Planning Committee (UNEPC) Report. A formal report was not made to the Advisory Council. In the Council's discussion it was noted that the present UNEPC model was not working. Little useful information is available for out-year expeditionary planning. This is in large part a consequence of the general preoccupation with achieving effective schedules for the immediate ship scheduling year (e.g., currently the 1987 operating year.)

The sense of the Council was that the AC Chairman should discuss the status and effectiveness of UNEPC with Chairman George Shor with the intent to recommend either that UNEPC be changed to a more useful model or be discontinued.

Fleet Replacement Committee (FRC) Report. Committee Chairman Robertson Dinsmore noted that the FRC report had been completed and distributed to UNOLS members. The report consists of three volumes: *A Plan for Improved Capability of the University-National Oceanographic Research Fleet; Science Mission Requirements for New Oceanographic Research Ships; and Summary of Concept Designs*. In addition, reports of eight individual new conceptual ship design studies are available.

The UNOLS resolution to form a Fleet Replacement Committee charged to begin planning for replacement of large ships in the UNOLS fleet immediately, to develop a schedule for replacement of intermediate and smaller vessels and to consider means for promoting greater cost efficiency in the fleet was made in October, 1982. The FRC was formed in 1983 under Chairman Robertson Dinsmore. During 1983 the Committee set its objectives in accordance with its charge from UNOLS, began to define science mission requirements and fostered proposals for conceptual designs. Grants for the Fleet Replacement Study and individual conceptual designs were made in 1984, and the Committee's activities have continued intensely to produce their study report. A *Summary of the Plan for Improved Capability of the University Oceanographic Research Fleet, April 1986* is Appendix III.

In a letter of transmittal to the UNOLS Chairman, Captain Dinsmore noted that with the Report the FRC's work on its charge from UNOLS was finished. He suggested, however, that UNOLS should continue a fleet improvement planning activity through a reconstituted (and perhaps renamed) Fleet Replacement Committee. The new committee should: continue to amplify and update the UNOLS fleet plan, refine requirements and begin conceptual designs for intermediate, coastal and special ships; pursue and refine selected designs for larger vessel classes; and continue to focus and amplify UNOLS fleet improvement efforts.

The Committee, together with representatives from ONR and NSF, discussed the FRC report and recommendations concerning continuing activity. Although some concerns were aired (e.g., Will operating funds be available for a more expensive fleet? Can a plan that looks like ship-for-ship replacement be supported? Is the need for large ship replacement critical?), the Council was highly supportive of the report. They especially emphasized the need for a continuation of UNOLS fleet improvement efforts and the critical need for a focus of those activities.

UNOLS ADVISORY COUNCIL RECOMMENDATION ON CONTINUATION OF FLEET REPLACEMENT COMMITTEE

The UNOLS Advisory Council

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

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

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

a. Amplify and update the UNOLS Fleet Improvement Plan in accordance with continuing efforts, new information and changing circumstances.

b. Continue the planning effort to include the roles, scientific mission requirements, and conceptual designs for smaller vessels and innovative platforms.

c. In the case of the larger research vessels, two of the existing new concept designs should be carried into a more detailed design phase. Specifically, the SWATH ship by SSS Co. and the Medium Endurance Ship by Glosten Associates show exciting promise as innovative new research ships.

d. The Committee should serve as a liaison activity and a source of information for Federal Agency Representatives working on behalf of the community in matters of planning for new ship construction and upgrading.

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

Approved by the UNOLS Advisory Council June 2, 1986

The Council discussed with the Chairmen, UNOLS and FRC, candidates for a new Fleet Committee.

House Merchant Marine and Fisheries Committee Hearings (Item inserted in agenda to allow participation by key meeting attendees.) The Council was alerted that the House Merchant Marine and Fisheries Committee, Subcommittee on Oceanography, had scheduled June 24, 1986 hearings on the Federal Oceanographic Fleet to provide an overview of fleet status. Although HMMF has oversight authority over NOAA and the Coast Guard but not NSF, ONR or other federal ocean research sponsoring agencies, they planned to examine all

elements of the Federal Oceanographic Fleet. Emphasis would be on the NOAA component.

The hearing would include a general overview by witnesses from the academic community, a discussion of specific research areas requiring vessel support (again, academic witnesses) and reports from parent agencies of the Federal Reserve Fleet (NOAA, NSF, Navy and Coast Guard).

Ferris Webster has been asked to testify, as Chairman, UNOLS as has Robert Corell, as Chairman, Ocean Sciences (NSF) Advisory Committee.

The Advisory Council agreed that the HMMF hearings were important to the oceanographic community and to UNOLS, even though that committee does not have cognizance over NSF and ONR, the agencies that provide most of the support to UNOLS institutions. Witnesses will coordinate their invited testimony for the hearings.

U.S. - U.K. Cooperation in Research Vessel Use. Don Heinrichs provided a status report on NSF efforts in arranging shiptime exchanges with France and the United Kingdom, to allow investigators from each of the countries to have ship time in areas where their country's vessels do not normally operate. Over the last three years NSF with NERC of the United Kingdom and IFREMER of France have developed informal agreements whereby equivalent ship use can be exchanged without actually paying for the time.

In the first exchange, in 1985, French investigators conducted a program on the CONRAD, and later a U.S. scientist worked off the French LE NROIT in the Mediterranean. During 1986-87 U.S. scientists will use the DARWIN in the Indian Ocean in exchange for U.K. scientists' use of the WASHINGTON in the western Pacific. In each of these exchanges U.S. scientists would not have been provided timely UNOLS ship use.

A meeting is being arranged among U.S., U.K., French and West German representatives later this year to discuss expansion of the informal exchange program.

Forecasts from Federal Funding Agencies. A letter from Grant Gross, Director, OCE, NSF to the Head, Ocean Studies Board, NRC/NAS was the focus of lengthy Advisory Council discussion. Dr. Gross's letter noted that several UNOLS ships (including more than half of Classes A and B) would not be operating at the end of 1986, or have otherwise abbreviated 1986 schedules. Furthermore, although budgets and schedules are not yet set for 1987, it seems likely that a significant portion of the UNOLS fleet would be laid up or on abbreviated schedules in 1987. There are not sufficient funds available to operate all ships in the UNOLS fleet at

full capacity in 1986 or 1987. The immediate reason is that funds for ship operations have declined through the 1970's and early 1980's: in ONR from about 25% to 11%, in USGS, MMS and DOE to less than 5%, and in NSF a loss of purchasing power of about 5% from 1970 to 1985.

At the same time, funding for science proposals has declined, perhaps more dramatically. OCE is now funding about one-third of the proposals received, although up to twice that portion would be supportable, given adequate budgets.

Thus, the compelling need is for better overall program funding, to provide adequate support for science as well as operations.

"We, as a community, need to work out a strategy to assure continued availability of needed ships while insuring that we are not hurting the science by continuing to support ships that cannot be used by seagoing projects."

Before discussing the messages in the letter, *Don Heinrichs, OCE/OCFS*, provided OCE budget information:

	FY1984	FY1985	FY1986 (projection)	FY1986 (after GHR cuts)	FY1987 (budget request)
OCE budget	$114M	$121M	$126M	$119M	$133M

Although both authorizing and appropriations committees in Congress have reacted favorably to NSF requests, anticipations are that final 1987 budget for OCE will be $119M to $125M.

Especially given this projection for essentially level funding for 1987, NSF cannot afford the fleet capacity available. Supporting capacity in excess of that needed to support science programs reduces the funding available to science. NSF staff has been meeting with ONR staff to negotiate a cohesive solution to the overall problems.

Current estimates are that several ships in intermediate and larger classes will have only limited schedules for 1987, and might not be in operation early in the year. NSF needs recommendations now on individual ships that will not go into service in the first half of 1987. (This NSF position is consistent with their messages to the UNOLS community beginning prior to UNOLS' March ship scheduling meetings.)

East-West Coast Ship Scheduling Group Meetings. Since individual and joint ship scheduling meetings were to be held on the following day, June 3, up-to-date schedule projections and recommendations were not discussed. It was noted, however, that Chairmen of the scheduling groups

recognized the situation regarding the mismatch between 1987 fleet capacity and anticipated funding: they will strive to reach recommendations, based on the information available.

UNOLS Elections. Slates of nominees had already been distributed to the Council, UNOLS Members, Associate Members and others. The slate was noted but not discussed.

Procedures for Reporting Surface and Subsurface Obstacles. Material on proposed procedures for reporting to the Navy surface and subsurface obstacles or operations had been distributed earlier. This issue had been raised by UNOLS Members. Discussion was deferred to the UNOLS Semiannual Meeting.

Advisory Council Standing Roles. Those Council roles that had not already been addressed were reviewed.

Cruise Assessments. The Council examined summaries of cruise assessment reports for the third and fourth quarters, 1985. No changes had been made in assessment procedures (see Advisory Council meeting report for February 6, 7, 1986.)

Fleet Management and Triennial Review. Charles Miller noted that although the Council was not currently engaged in a triennial review of fleet management, composition and distribution there were a number of issues of concern. A summary of management issues might include: short-term unused fleet capacity (at least in 1986 and 1987), sources of funding to operate an improved UNOLS fleet, the efficacy of existing UNOLS procedures for scheduling and operating the fleet, and criteria for defining the numbers and kinds of ships needed in an improved UNOLS fleet for the twentieth century.

An Issue Paper, *Some New Ideas on Oceanographic Ship Facilities - Innovation or Blasphemy?* by Advisory Council member Arthur Maxwell had been circulated (Appendix IV). Oceanographic research, as all federally funded research, is facing budget strictures likely to endure for some time. This is a particular challenge to oceanography because there is an arising need to replace our research fleet with a more capable one.

Ships in the improved fleet, as outlined in the FRC Report, will be more capable of supporting research at sea, will likely be larger than existing ships, and more expensive to operate. *With the present mode of research fleet management and operation, it is difficult to see how Federal funding agencies can support a new, more expensive fleet.*

Alternatives to our traditional mode of ship operation should be considered. These alternative modes of operation

might dictate research fleet compositions considerably different than the makeup of the existing UNOLS fleet and of the composition advanced in the Fleet Replacement Plan.

Two alternative schemes were advanced. In the first, NSF and Navy would agree to a comprehensive plan for cooperatively acquiring and operating an improved fleet for their academic ocean research program. The fleet would consist of a small number of large, capable ships operated as national facilities (either analagous to UNOLS operation for ALVIN/ATLANTIS II or to the drilling program's JOIDES RESOLUTION). A second alternative was to provide for blue-water ocean research needs by chartering from industry. Either option would centralize fleet management, would sharply limit the number of ship operating institutions, and would decrease the number of ships operating under assured Federal funding.

In discussing issues in fleet management and the Maxwell concept, the Council (and observers) made several points:

There is widespread sentiment to examine alternative options in planning for and in management schemes for a new research fleet,

In any such examination note should be taken that a strength of academic oceanography in the U.S. has been the diverse mode of operation of the research fleet wherein individual ships are operated by research institutions as an integral part of their research enterprise. This has been especially important in helping to ensure that vessel operation has remained closely coupled to research institutions, programs and individual investigators. The Council did not consider in depth the specific alternatives advanced by Art Maxwell; they did note that additional options could and should be developed.

The Advisory Council agreed that they should make a study of alternative mechanisms for managing and operating the academic fleet, should examine the make-up and characteristics of a fleet for the 1990's and beyond and match various options in those two studies against the fleet requirements of projected U.S. academic research programs. The Advisory Council's formal resolution:

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

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

Therefore, the UNOLS Advisory Council shall review and make recommendations concerning:

1. The general composition of the UNOLS fleet for the 1990's and beyond. (An assessment not by specific ships or platforms, but of sizes, classes, general characteristics and capabilities of the fleet essential to the support of the ocean sciences forecast for the 1990's and beyond.)

2. Current and alternative mechanism for managing and operating the vessels of the UNOLS academic research fleet and for funding and supporting that fleet.

3. Management strategies and mechanism to match the UNOLS fleet to the needs of the ocean science research.

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

Shipboard Scientific Instrumentation. John Martin continues to gather information from ship operating institutions on their policies and charges for the use of various shipboard equipment and instrumentation and for technical support personnel. Results from his letter surveys will be reported to the Council and will be used to help define workshops or further review if results indicate that workshops, etc. are needed.

UNOLS News. Tom Malone noted that his schedule for UNOLS News is to distribute an issue during the month following each Advisory Council or UNOLS meeting. He suggested also that UNOLS News would be more valuable if Advisory Council members and others in the UNOLS/oceanographic community would generate and submit articles for publication. News issues so far have been too dependent on the editor's efforts to solicit articles or to select items from UNOLS meeting reports.

UNOLS Communications. Ferris Webster reported that he is gathering the information to update his earlier report on trends in Oceanography Funding in Federal Ocean Programs (as published in UNOLS News, v.2, n.1). He will submit an updated table for publication in a future UNOLS News.

Robert Corell reported on activities of the *Advisory Committee to the Ocean Science Division, NSF*. An updated version of the Long Range Plan will be the focus of next week's OCE Advisory Committee meeting. This version will strongly emphasize the issue of ships and platforms to support ocean

science research. The new version will also include an expanded section on shipboard technology.

A scheme has been implemented that provides ties among the several advisory committees to the divisions in the Geosciences Directorate through a set of dual memberships (e.g., at least one member of the OCE Advisory Committee is also a member of the Polar Programs Advisory Committee).

The efforts of the OCE Advisory Committee are gaining attention at all levels in NSF, and beyond. The Long Range Plan, especially, has been widely acknowledged, and it has been favorably received by Erich Bloch, Director, NSF.

Acquisition and Management of Advanced Technical Facilities. Charles Miller reminded the Council of their earlier recommendations to establish an Oceanographic Supercomputing Committee (OSCC), as reported in the Advisory Committee minutes for February 6, 7, 1986. Correspondence on OSCC among the Chairman, Advisory Council, Council members and the Director, OCE Division had been distributed to the Council. *Don Heinrichs* explained that the letter form Grant Gross could be considered as a response favoring establishment of a position at NCAR to support and facilitate supercomputer use by the oceanographic community. A small OSCC to provide definition, guidance, and oversight for the position might also be useful. Dr. Miller agreed to initiate arrangements.

Forecasts from Federal Funding Agencies. Keith Kaulum, ONR, reported that NAVSEA was in the final stages of preparation of the Request for Proposals on the AGOR-23 research vessel. The RFP is for a $23.5M procurement, and should be issued in early August. The Circular of Requirements would include minimum requirements for a 12-knot ship of good general capabilities. In addition, a successful bidder can meet a series of enhancements, to be scored on a rank system. Proposals will be due in February.

The Advisory Council expressed concern over how the AGOR-23 would get into the UNOLS fleet, how the operating institution would be picked, how the designated operating institution might participate in construction design and construction management (e.g., influence such factors as layouts, etc).

Mr. Kaulum stated that while procedures have not been finally established, ONR is working with NSF on a selection process and on selection of an institution. ONR's position now is that the operator should be selected by the time construction proposals are received (February, 1987). AGOR-23 entry into the UNOLS Fleet will be coupled with the retirement of an AGOR-3. *Several mechanisms for selecting the operating institution are still being considered.*

The Advisory Council strongly urged that the selection of an operating institution be the result of a process as open as possible.

Various Navy actions on their initiative to replace Navy-owned oceanographic research vessels (both those in the academic fleet and others operated for Navy labs and elements) suggest that at least two ships would be constructed soon. One of these ships would be for the academic fleet.

Modification/repowering KNORR and MELVILLE had been endorsed by a CNO Executive Board, and would be in budgets for 1988, 1989 or no later than 1990.

There is concern within ONR that the immediate (1986 and 1987) extra UNOLS fleet capacity is not consistent with a decision to renovate KNORR and MELVILLE.

The Advisory Council's position was in support of the renovations. They agreed that renovation of the KNORR and MELVILLE was a critical part of UNOLS Fleet Replacement plans. Those plans address fleet needs for the 1990's and beyond; they should be de-coupled from concerns over short term fleet capacity, etc. Further, KNORR and MELVILLE have impressive capabilities for support of ocean research. By agreement, the Chairman, UNOLS will write a letter to the Chief of Naval Research endorsing renovation of KNORR and MELVILLE.

Other Business. The Council discussed briefly a suggestion that some time on UNOLS ships might be made available to provide ship training for undergraduates.

They also noted recently-published remarks that suggested that UNOLS safety policies, procedures and practices are inferior to those of offshore commercial practices. The Council did not agree, but will not pursue the matter.

A letter from John Edmond, MIT, called attention to increasing difficulties in air transportation of scientific equipment and supplies (Appendix V). The Council suggested that the community be alerted to the problem through publication in UNOLS News, and that the letter be referred to RVOC for more explicit action.

The meeting was adjourned at 5:15 p.m.

UNOLS ADVISORY COUNCIL
AGENDA FOR MEETING
8:30 a.m., Monday, June 2, 1986
Room 353
Joseph Henry Building-National Academy of Sciences
2100 Pennsylvania Avenue NW
Washington, DC

Accept Minutes of February 6, 7, 1986 Meeting

Examine Agenda for June 4, 1986 UNOLS Semiannual Meeting

Chairman's Report - *Ferris Webster*

Advisory Council Report - *Charles Miller*

ALVIN Review Committee Report - *Robert Corell. Also will include A/C Status Report*

International Restrictions to Ocean Science Committee Report - *Harris B. Stewart. Also includes A/C status report on IROSC.*

UNOLS National Expeditionary Planning Process Committee Report- *A/C discussion on UNEPC.*

Fleet Replacement Committee Report - *Robertson P. Dinsmore. Also includes A/C status report on FRC.*

East-West Ship Scheduling - *Robertson Dinsmore, John Martin and Harris Stewart-Includes reports on March Ship Scheduling Meetings and Prospects for the June 3 Scheduling Meetings.*

Principal Address, William J. Merrell - Outlook for FY-1987 Ship and Program Support - *Forecasts from Federal Funding Agencies- Will include pertinent agency information to the Advisory Council. From among Don Heinrichs, John McMillan, Dick West, NSF, John Albright, NOAA, Keith Kaulum, ONR, Robert Rowland, USGS, Hawley Thomas, MMS, William Erb, DOS.*

U.S.-U.K. Cooperation in Research Vessel Use - *Remarks from D. Heinrichs, J. McMillan.*

Clearances for Research, Foreign Waters - *William Erb for DOS*

UNOLS Elections - The Slate - *Charles Miller.*

Procedures for Reporting Surface and Subsurface Obstacles - The Issue- *William D. Barbee.*

ADVISORY COUNCIL STANDING ROLES - *Most A/C standing roles will have been covered above. The remaining will be reviewed.*

User Assessment Forms - *Returns for 3rd and 4th quarters, 1985 will be reviewed-William Barbee for Carl Lorenzen.*

Fleet Management and Triennial Review - *C. Miller. Among other issues, Art Maxwell's paper on Management of Ship Facilities.*

Shipboard Scientific Instrumentation - *John Martin.*

UNOLS News - *T. Malone*

UNOLS Communications - *Miller, Webster-Reports on new issues, Federal program slates, etc. A/C discussion. Includes trends and forecasts, etc. R. Corell on OCE Advisory Committee.*

Acquisition and Management of Advanced Technical Facilities - *C. Miller, C. Mooers-Progress on establishing a UNOLS Oceanographic Supercomputing Committee (OSCC). Other Issues.*

Other Business - *Possible issues include:*
Ship Training for undergraduates.
Transport of scientific equipment, reagents, etc. (Edmond letter)
Ocean Science News report of comments on UNOLS research ship safety record.

A REPORT
to the
UNOLS ADVISORY COUNCIL
on
Problems Encountered by the UNOLS Ship—operating Institutions in Obtaining Clearances to work in Waters Under Foreign Jurisdiction

by

Harris B. Stewart, Jr.

June 2, 1986

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EXECUTIVE SUMMARY

At the request of the UNOLS Advisory Council, a study was undertaken to determine the magnitude of the problems encountered by the UNOLS ship-operating institutions in obtaining research vessel clearances to operate in the waters claimed by other nations. A questionnaire was sent to nineteen UNOLS institutions. Replies received from thirteen indicated eight denials out of one hundred thirty-one requests submitted to the State Department since 1 January 1984. Problems were encountered with Mexico (3), Venezuela (2), and one each with Brazil, Trinidad and Tobago, and the USSR. The major problem, however, was not request denials but inordinate delays in request approval.

In general, relationships with the State Department were satisfactory. The respondees felt that the Research Vessel Clearance office needed additional personnel and a computer to facilitate tracking the progress of requests and more frequent communication with Principal Investigators on the status of pending requests. Many felt the delay problem lay primarily in the United States' embassies rather than with State in Washington.

The report will be updated following the receipt of the six remaining replies and interviews at State, National Science Foundation and ONR.

INTRODUCTION AND BACKGROUND

In response to concerns expressed by UNOLS members, the Advisory Council decided at its February 1986 meeting to undertake a study to determine the extent of problems encountered by the UNOLS ship-operators in obtaining vessel clearances to operate in waters under the jurisdiction of foreign nations. Harris Stewart agreed to undertake the task with support from UNOLS under NSF Grant OCE 85-0086.

Rather than take an expensive trip to visit the nineteen institutions for interviews, it was decided to use a short questionnaire (Appendix I) to elicit the required information. This report summarizes the responses obtained to date from thirteen of the nineteen institutions that received the questionnaire. This should be considered as an interim report. The final report must await the return of the remaining six questionnaires and the results of personal interviews with representatives of the State Department, NFS, and ONR that could not be accommodated by the time of the Semi-Annual UNOLS meeting on 4 June 1986.

A Report to the UNOLS Advisory Council

SUMMARY OF RESULTS

Clearance Requests and Denials

Since January 1984, the 13 responding institutions submitted a total of 131 clearance requests to the State Department. Of these, eight were not granted (6%) for various reasons. Three denials involved Mexico, two Venezuela, and one each Brazil, Trinidad and Tobago, and the USSR. The following reasons were given for clearance denials:

Mexico

1) Apparently Embassy problems in Mexico. Operator not informed of denial for three weeks after the embassy was told. Embassy officials initially discouraged attempts to reverse the denial. Allegations of illegal port stops and document falsification remain unresolved.

2) Clearance request was withdrawn because Mexican Foreign Office required certain information in a very short time. They accused the P. I. of "improper" conduct on a previous cruise.

3) Clearance denied because of late submission by State department.

Venezuela

1) Clearance originally granted but later withdrawn by the Venezuelan Navy which demanded a local port call and inspection. Impasse unresolved prior to sailing, so Venezuelan waters were avoided. Problem was internal to Venezuela.

2) Reason for denial unknown.

Brazil

1) Denial because of unspecified disenchantment with the NRL Project.

Trinidad and Tobago

1) No response from government of Trinidad and Tobago

USSR

1) No reason given for denial.

Problems Encountered

Each institution was asked for details on any specific problems they had encountered in obtaining timely research vessel clearances. Some of the respondees had not requested any clearances during this period, but eleven institutes responded at various lengths. The original responses are on file in the UNOLS office, but for this report the responses are presented in toto for most and summarized or paraphrased for those requesting confidentiality. The identification of each respondee is intentionally omitted.

1) We have to be very specific in requests and frequently monitor the progress of the State Department. Delays in granting Japanese clearances due to their always wanting more details about planned work.

2) Seven to eight months pass before the host country (Peru and Ecuador) approved our clearance request.

3) Last minute permission received from Mexico. Difficult to arrange for observer on cruises.

4) "Timing" - Some countries that require a six-month lead time can not expect detailed information on the cruise plan. Also many countries have contradictory requirements, e.g., visas for all personnel before clearance is given, and issuance of visas dependent upon obtaining clearance (Indonesia).

5) Since the present team of Bill Erb and Tom Cocke formed up at State, I have had almost no problems which could be attributed to that part of the system. The biggest constraint has been getting the scientists to provide information in a timely fashion. However, now that ship scheduling is operating with more lead time, I suspect that the diplomatic problems will be solved as a by-product of planning science farther ahead.

6) No problems, really, except sometimes the lackadaisical attitude exhibited by State.

7) Problem is the delays in the issuance of permits from foreign countries. Foreign permits are sometimes received as late as the sailing date and occasionally after the vessel has departed. This creates uncertainty for the investigator and the ship operator.

8) We have had no difficulty with clearances, and the State Department has been most helpful. We have not, and at this time do not anticipate requesting a clearance to a "difficult" area. Canada supplied numbers designating areas we could not go into, but we have been able to find charts or coordinates of these areas through the State department. This, however, has not been a problem to our operation.

9) Most clearances come at the last minute. this is not a big problem, but it is stressful to the Principal Investigator involved.

10) In 1985 we requested clearance for Brazil prior to funding approval for the scientific program. The funding decision was withheld for several months; and in the meantime, clearance was granted. Program funding was eventually denied, and the clearance had to be cancelled.

11) Delays in response from the State Department to our clearance requests is a major problem. Often the vessel is enroute to the area before the clearance is received. Expensive schedule changes would be required if clearance were denied at the last minute, not to mention the disruption of the science programs. The identification of observers is frequently late, and many must be provided with travel expenses.

Relationship with the State Department

The institutions were asked if their dealing with the State Department had been satisfactory and to provide details of any problems encountered specifically with State. Two institutions that had not requested clearances since January 1984 did not respond to this question. The other eleven did, and their responses, as above, are given here without attribution and paraphrased where so requested.

1) For the most part satisfactory, but sometimes it is difficult to get hypothetical boundary lines from State.

2) satisfactory.

3) Overall satisfactory. I forwarded five copies each of several papers, and it would be nice if they were acknowledged.

4) The State Department has a "work overload" with the increase in clearances and the same staffing. It is hard to believe that they can keep up. I hope this does not cause clearance officers to stay a short time because of frustration in working conditions.

5) Over the past twenty years, I have been critical of State and as vociferous as anyone. The important thing is that my noise level has dropped about two orders of magnitude during the past five years. Of the dozen or so clearance requests submitted since January 1984, we have had no problems or rejections. Perhaps we have been lucky, just dealing with "nice" countries; perhaps I have done my homework well. In any event, I do not recall any troubles with the State Department system.

6) Our only problem was having to prod State repeatedly to obtain a clearance which was granted after the ship was underway.

7) Satisfactory.

8) Excellent. We have had no difficulty with clearances, and the State Department has been most helpful.

9) State had been very helpful.

10) Dealings with the State Department have been cordial and cooperative, although it sometimes appears that clearance coordination activities could be handled more firmly, effectively, and efficiently at the interfacing level.

11) Delayed clearance problems suggest that State had little or no control over U.S. embassy personnel in foreign countries who are responsible for getting clearance approval. A recent request to Morocco apparently got lost between leaving State on 13 September 1985 and the 28 March arrival at the Foreign Ministry. Clearance was received on 3 April, the scheduled date the cruise was due to leave. The problem seems to be more with the embassies in foreign countries that with State in D. C.

Suggestions for Improvement

Numerous suggestions for improving the system were provided by the responding institutions. As previously, these are presented here without attribution.

1) Get more manpower for Tom Cocke's office. Have the Geographer's Office provide hypothetical boundary lines for use in planning. More or better coordination between Research Vessel Clearance Officers and the various Country Desk Officers.

2) More written communication from State regarding the status of requests.

3) More personal dealings with counterparts in Mexico, exchange of key personnel.

4) No suggestions for the State Department. Encourage the scientists to make contacts with host country counterparts, have embassies beat the drum for oceanography, and be sure to follow up on post-cruise obligations. If we do these things, I think the system which exists is workable.

5) Improve their (State Department) attitude.

6) What causes the delays? State Department could best explain reasons for delays. Is there a pattern to explain delays and difficulties in obtaining clearances?

7) Although it has not affected us, I worry about the Principal Investigators' responsibility and how to enforce it with respect to submitting reports.

8) Buy Tom Cocke a computer so he can keep track of requests.

9) Improvement in obtaining clearances might be achieved with more positive interpersonal relationships.

10) State should acknowledge receipt of requests. State should inform institution from time to time on progress. State should be aggressive in pushing embassies for early decisions by host government. State should not hesitate to use scientists with foreign contacts to help expedite clearance approval. For required lead times of four months or more, some tracking system should be developed by the embassy to keep State and the operator informed of progress. State must remain the lead agency for obtaining approvals.

CONCLUSIONS

From the thirteen replies received to date, the major problem is clearly the inordinate delay encountered in the granting of vessel clearance requests. Denial of requests is much less of a problem than delay in receiving approval. As one respondee wrote "Denials are not a complete measure of the effectiveness of the clearance system. The impact on science or operations also should be known. This means how many cruises were affected by work prohibitions, track changes, port calls, start and stop delays, unplanned costs, and other impacts on planned science.....Although our records do not document it, lots of "fingernail biting" goes on especially before those cruises where clearances remain pending until days or weeks before the initiation of the work."

Almost without exception, relations with the State Department were satisfactory. Better and more frequent communication by State with those with clearance requests in progress was urged by several respondees.

When replies have been received from the remaining six institutions and meetings have been held with the appropriate officials at State, NSF, and ONR, this report on the extent of the problems with vessel clearance requests will be updated. It will then go to the UNOLS Advisory Council for review and recommendations on subsequent actions to be taken that might lead to desired improvements in the present system.

APPENDIX I

QUESTIONNAIRE AND COVERING LETTER

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

April 14, 1986

TO: UNOLS Ship Operators and Users

FROM: Harris B. Stewart, Jr., Chairman
Committee on International Restrictions on Ocean Science, UNOLS Advisory Council

At the last meeting of the UNOLS Advisory Council, the growing concern among ship operators and Principal Investigators over problems in obtaining timely clearances for research cruises in the waters of other nations received a good deal of attention. It was decided that before any corrective measures were recommended, we had to have a much better understanding of the magnitude and complexity of the problem. There apparently are many possible contributing factors: late submission of requests, last minute changes in schedules or personnel, delay or refusal by the foreign nation in granting the clearance, unacceptable restrictions, foul-up by State, and probably others.

The Advisory Council's international group (IROSC) was charged with preparing a report for the June semi-annual UNOLS meeting giving the details of the problem. Based on this report and on conversations with State, recommendations will be prepared in hopes of improving the system for all concerned.

It was decided that, although a questionnaire is a real annoyance, this would be the cheapest and easiest way to accomplish the task. We have tried to keep it as simple as possible consistent with the need for the minimum amount of information required from you. The end result should make the research vessel clearance procedure less troublesome for you.

Please answer the questions on the attached sheet and send your reply to me at Post Office Box 6244, Norfolk, VA. 23508 to arrive by 15 May at the latest. You will be sent a copy of the full report when it is completed. Your assistance is obviously needed and will be greatly appreciated.

cc: C. Miller (UNOLS A/C)
W. Barbee (UNOLS)
IROSC Members
W. Erb (State)
T. Cocke (State)

Attachment.

HBS/dcd

U. N. O. L. S.
QUESTIONNAIRE REGARDING
RESEARCH VESSEL CLEARANCE REQUESTS

Please answer each of the following questions in as much detail as possible. Use a separate sheet for the longer answers.

1. Since January 1984, how many requests for research vessel clearance has your institution submitted to the State Department? _____

2. How many of these have been denied? _____
   a) What countries?

   _____

   b) Why?

   _____
   _____

3. What specific problems have you encountered in obtaining timely research vessel clearances? Please provide as much detail as possible.

   _____
   _____
   _____
   _____
   _____

4. How about your dealings with the State Department - have they been satisfactory? Any problems? Details please.

   _____
   _____
   _____
   _____
   _____

5. What, if any, suggestions do you have for improving the system?

   _____
   _____
   _____
   _____
   _____

Please reply by 15 May to
H. B. Stewart, Jr.
P. O. Box 6244
Norfolk, VA. 23508

APPENDIX I I

LIST OF INSTITUTIONS RECEIVING THE QUESTIONNAIRE

INSTITUTIONS RECEIVING THE QUESTIONNAIRE

WOODS HOLE OCEANOGRAPHIC INSTITUTION

UNIVERSITY OF RHODE ISLAND

LAMONT GEOLOGICAL OBSERVATORY

UNIVERSITY OF DELAWARE

UNIVERSITY OF NORTH CAROLINA

SKIDAWAY INSTITUTE OF OCEANOGRAPHY

UNIVERSITY OF MIAMI

UNIVERSITY OF TEXAS at Austin

TEXAS A&M UNIVERSITY

SCRIPPS INSTITUTION OF OCEANOGRAPHY

MOSS LANDING MARINE LABORATORY

OREGON STATE UNIVERSITY

UNIVERSITY OF WASHINGTON

SEA EDUCATION ASSOCIATION

JOHNS HOPKINS UNIVERSITY

UNIVERSITY OF MICHIGAN

UNIVERSITY OF SOUTHERN CALIFORNIA

UNIVERSITY OF ALASKA

UNIVERSITY OF HAWAII

Note: Replies received from all but the last six addressees.

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

SUMMARY

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

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

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

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

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

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

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

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

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

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

The principal findings upon which its report is based are:

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

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

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

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

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

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

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

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

Profile of Planned UNOLS Fleet

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

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

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

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

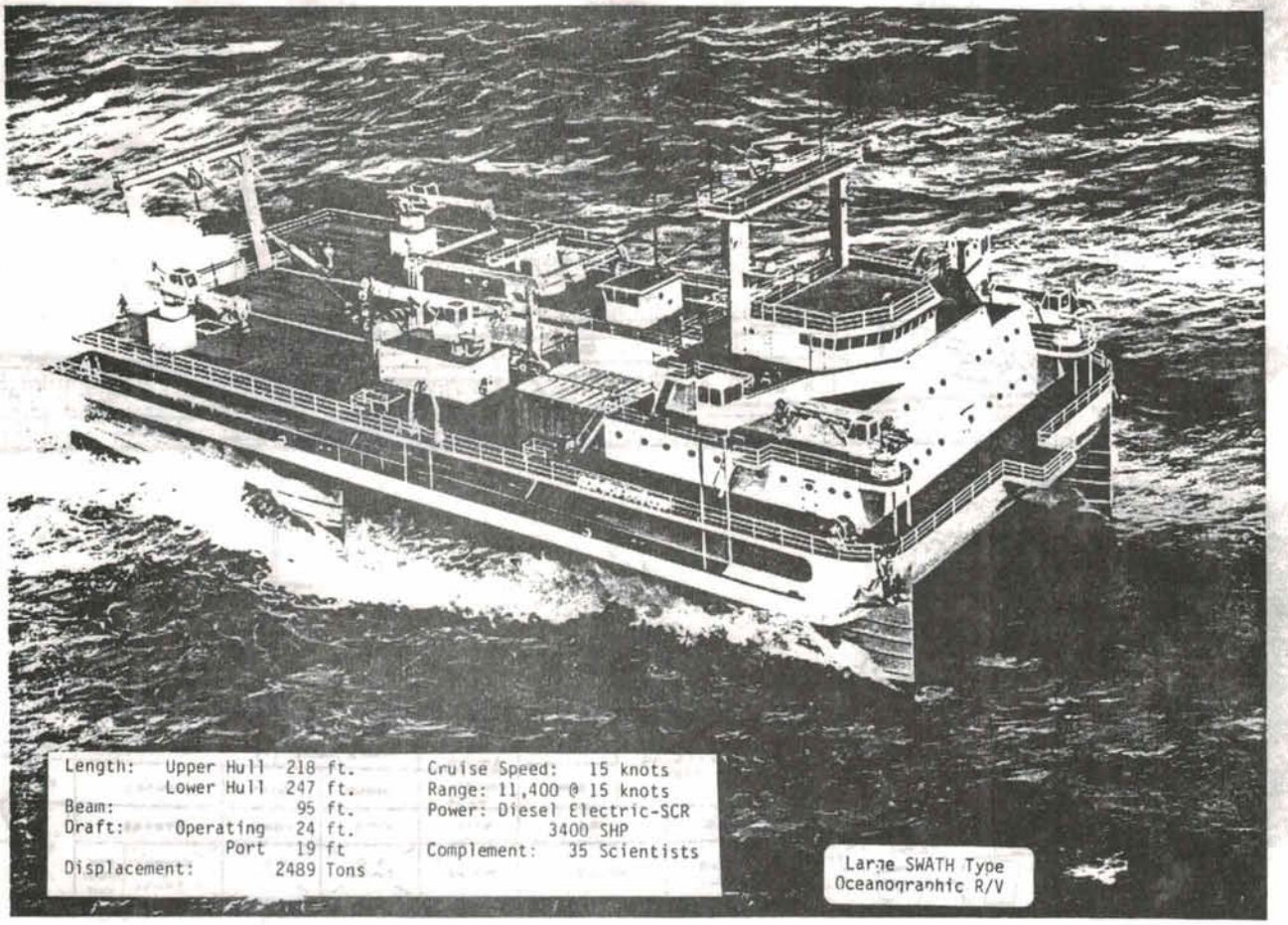
- **SWATH Ships.** The SWATH or semi-submerged ship is a relatively recent development in ship design. SWATH ships, in theory and performance, demonstrate a remarkably stable environment. Additionally, they have a platform configuration which is highly attractive for science and engineering operations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

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

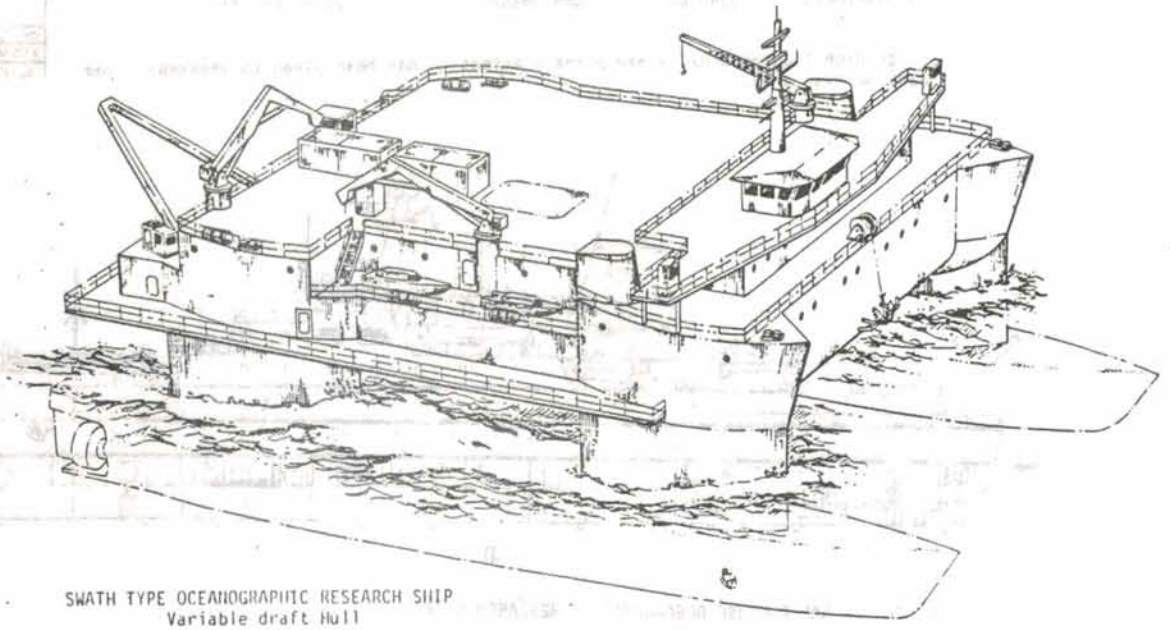
- **Medium Endurance Ships.** Ships of a 200-250 ft size range are intended to have the highest capability commensurate with this size range. Although of similar size to existing ships, they should provide superior seakeeping, laboratory arrangements and overall ability to do science at sea than is presently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

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

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



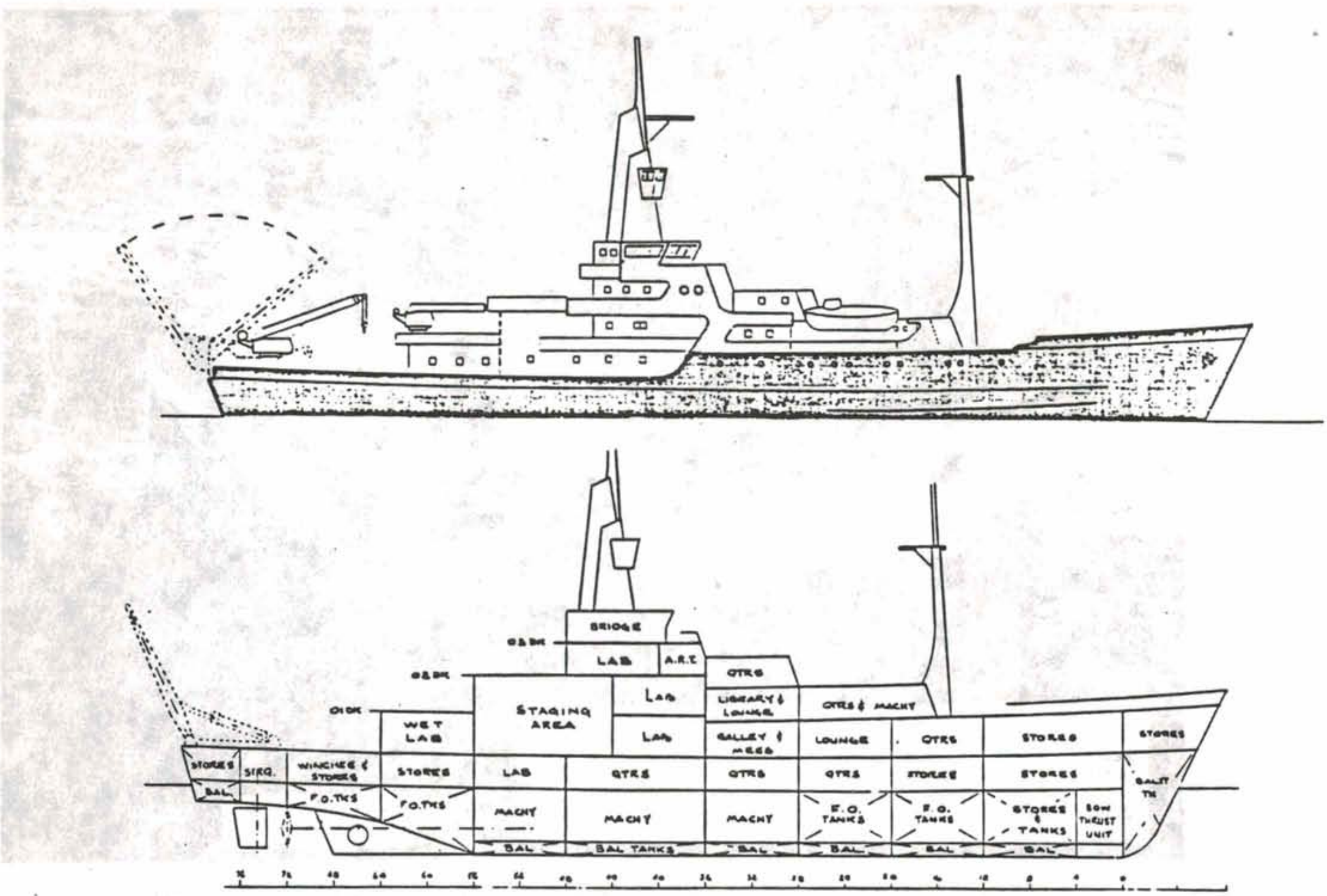
Small Waterplane Twin Hull (SWATH) Ship. Note abundance of deck space and overside handling capability including center well.



SWATH TYPE OCEANOGRAPHIC RESEARCH SHIP
Variable draft Hull

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

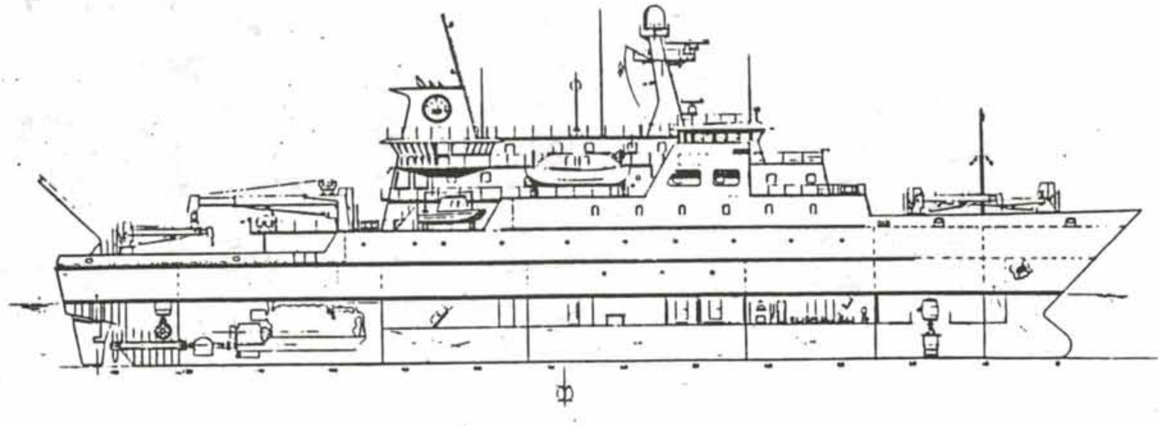
SWATH with interior center well area. Variable draft allows ballasting working deck close to water. Transits in catamaran mode.



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

WOODS HOLE OCEANOGRAPHIC INSTITUTION
JONATHAN LEIBY
MARINE DEPARTMENT
NECOR - LARGE RES SHIP - PRELIMINARY ARRGT
10-5-85 DWG No. 8506-

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

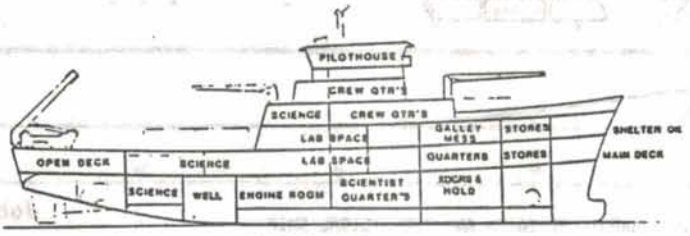


LARGE GENERAL PURPOSE OCEANOGRAPHIC RESEARCH SHIP

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

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

RODNEY E. LAY & ASSOCIATES
NAVAL ARCHITECTS
OUTBOARD PROFILE
300'-0" x 54'-0" x 28'-0"
RESEARCH VESSEL



INBOARD PROFILE

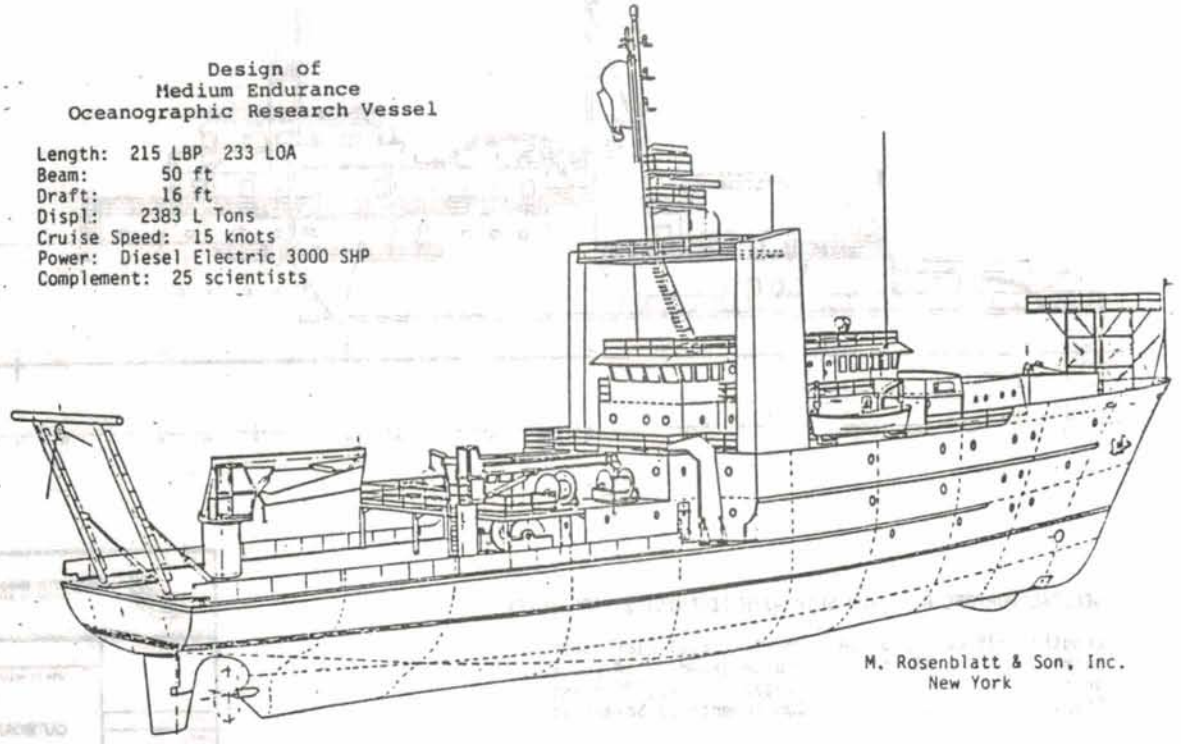
Length	212 LWL 228 LOA	Cruise Speed	14 knots
Beam	64 ft.	Range	10,500 nm
Draft	15 ft.	Power	3,000 SHP
Displ.	2,468 LT	Complement	25 Scientific

SCRIPPS INSTITUTION OF OCEANOGR
UNIVERSITY OF CALIFORNIA, SAN DIE
212' LWL RESEACH VESSEL
DESIGN CONCEPT- ARRANGEMENTS
THE GLOSTEN ASSOCIATES
CA/BLH | NO SCALE | OCT 1965 | 8534-2

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

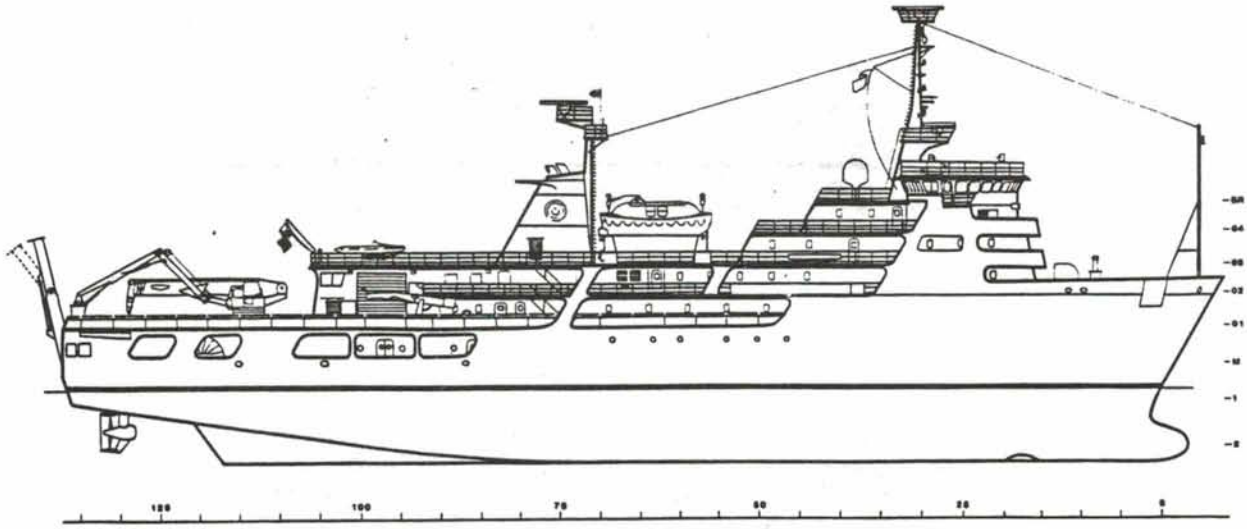
Design of
Medium Endurance
Oceanographic Research Vessel

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



M. Rosenblatt & Son, Inc.
New York

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

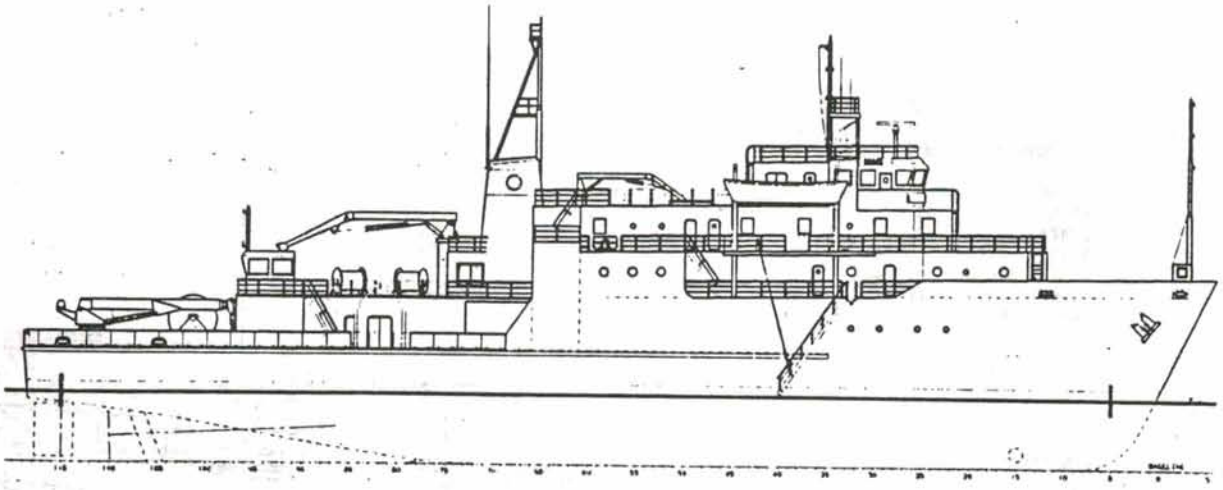


John Gilbert Associates

LARGE GENERAL PURPOSE RESEARCH AND GEOPHYSICAL SHIP

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

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



GENERAL PURPOSE RESEARCH SHIP WITH GEOPHYSICS CAPABILITY

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

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

MARINETTE MARINE CORPORATION

OUTBOARD PROFILE

SUMMARY COMPARISON OF SCIENCE REQUIREMENTS FOR LARGE SHIPS

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

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

1. A replacement schedule which is realistic in terms of the national effort an economy. The effect of this would be to smooth the peaks of existing ship construction dates into a reasonably uniform number of replacements per year.

2. A priority of new construction based upon the material condition and scientific capability of existing ships.

3. A priority of new construction based upon the needs of ongoing science.

Fleet Improvement Plan Shown by 5-year Increments

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

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

UNOLS FLEET REPLACEMENT COMMITTEE

MEMBERS

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

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April 28, 1986

Dr. Charles B. Miller
School of Oceanography
Oregon State University
Corvallis, Oregon 97331

Dear Charlie:

I am enclosing a copy of a paper I have prepared for discussion at a forthcoming meeting of the JOI Board of Governors. Since the issues I raise have some bearing to UNOLS and the UNOLS Advisory Council, I thought it appropriate to send you a copy.

It would seem to me that UNOLS and the Advisory Council may also wish to discuss these subjects at a future meeting.

I would appreciate your comments.

Sincerely,

Art

Arthur E. Maxwell
Director

Enclosure

cc: Captain William Barbee

SOME NEW IDEAS ON OCEANOGRAPHIC SHIP FACILITIES

— INNOVATION OR BLASPHEMY?

Arthur E. Maxwell, University of Texas

Frank Press, in his 21 March article in SCIENCE magazine, pointed out that the budgetary crisis in science is likely to endure for years, perhaps to the end of the century. Consequently, during this period there is special need to ensure the optimal use of limited funds. Press presented some novel ideas concerning "pooled" research programs to be made available on a competitive basis to proposals from the general scientific community. It was an illustration of the kind of innovative thinking that is needed to increase research productivity by improved resource allocation.

In my opinion, oceanographers in particular would be well advised to heed this admonition. We face an onerous situation during this period of tight budgets, in that our research fleet -- the backbone of our ability to work at sea -- will become old, obsolete and will need to be replaced in some manner. Already budgets to operate the existing fleet are inadequate and funds to replace these ships will be difficult or near impossible to obtain. Following the lead of Press, oceanographers need to put forth some novel ideas concerning ships, if we are to ensure that U.S. scientists have access to the best seagoing facilities available. Our present mode of operation may prove to be a luxury which is no longer affordable. The situation may require a complete rethinking

of how expensive seagoing resources are allocated, in order that all scientists have equitable access on a competitive basis.

The present fleet has been provided to the academic community primarily by the Navy and NSF. Historically, these ships have been placed at various laboratories around the country. Initially they were, in general, operated for the scientists of the laboratory at which they were located. More recently, under the auspices of the University-National Oceanographic Laboratory System (UNOLS), these, plus other ships that have been added through private resources, have operated on a more integrated national basis. Since this mode of operation has been efficient, cost effective, and has served the community well, one might appropriately ask, why then should any changes be considered. The reason, of course, is that over the years many factors have developed which, taken together, suggest the current mode of operation is no longer optimal. Some of these factors are: Aging and obsolescence of the fleet; budgets no longer adequate to support the existing fleet; scientific experiments often requiring large stable platforms; dramatically increased efficiency in data acquisition; specialization of facilities becoming more important; specialized facilities being extremely expensive from both the capitalization and operational aspects; and users of both specialized and general purpose facilities tending to be disbursed around many laboratories, including those not presently operating ships.

The UNOLS Fleet Replacement Committee has recently completed a major study directed at solving the dilemma of the aging fleet. With broad community input, they have collated many ship characteristics and

conceptual designs desired by U.S. oceanographers. As a result there now exists a thorough documentation of a broad spectrum of sizes and types of ships needed. The Committee has done this with painstaking care and is to be commended for its effort. However, on the emotional and politically more sensitive issue of allocation of these resources, the Committee has chosen a conservative route by suggesting each existing ship be replaced with a more capable (and usually larger and more expensive to operate) ship. This results in an expensive fleet replacement program that extends well into the next century.

A more radical solution to fleet replacement should be considered. Such a solution should have elements of being financially viable both in capital and long-term operating costs. The solution should also recognize that oceanography appears to have reached a phase similar to that through which high energy physics, astronomy and computer sciences, to cite but a few, have already passed. Namely, seagoing facilities have become so expensive that the concept that each laboratory must have its own needs to be reexamined. Like other areas of science, oceanography must consider the fact that high quality facilities may only be available on a limited basis and at the expense of more formal shared usage. Other countries have adopted this type of solution long ago. To be blunt, the U.S. oceanographic community either must recognize this changing situation, or stand to lose the opportunity to continue in a leadership role in marine science.

There are many approaches to a reallocation of resources that might be considered to enable U.S. oceanographers to retain their preeminence in

the field. Two significantly different concepts are presented herein. Each of these is viable and perhaps some combination of the two more reasonable than either separately. The first concerns a small, high-quality research fleet which would require U.S. government funds for construction and operation. This concept is put forth in a series of nine proposals which need to be considered as a whole. The second concept takes advantage of industry's capital investment in seagoing facilites.

Option 1

(1) - It is proposed that the Navy and NSF formally agree to a unified ship replacement plan. This would take into consideration the fact that, although much of the capital acquisition costs would be provided by the Navy, the brunt of the long-term operational costs would be the responsibility of NSF.

(2) - It is proposed that the Federal Government (primarily NSF & NAVY) agree to provide the academic community with a new fleet of oceanographic research ships. The fleet would consist of five fully equipped large, long-endurance research ships having characteristics of the Gilbert and Associates or similar designs. Each would be about 300 feet in length, have high latitude capability and berthing capacity of 35-40 scentists. This design would provide for abundant deck and laboratory scientific space and the ships could be configured for both specialized and general purpose research. One of these ships should be equipped with an industry standard multichannel seismic system, and two others should have a reduced capacity MCS system. Others might be outfitted for specialized chemical, biological or physical oceanographic research.

(3) - It is proposed that NSF accept the responsibility for overseeing and budgeting for this fleet operation. The ship operations should be fully funded and access to them would be competitive on a national basis. This might be handled in a manner similar to either the ALVIN or JOIDES RESOLUTION operations.

(4) - It is proposed that the fleet be operated by a single organization selected by competition. Two of the ships would be home-ported on the East Coast (at the Woods Hole Oceanographic Intitution), two home-ported on the West Coast (at the Scripps Institution of Oceanography marine operating facility in San Diego), and one (with industry standard MCS) home-ported on the Gulf of Mexico (at the TAMU/UT marine operating facility on Pelican Island).

(5) - It is proposed that this fleet replace all existing UNOLS academic research ships exceeding 150 feet in length. Realizing there may be need for ships smaller than the 300' class, it is recommended the existing ships under 200' in length be retained, if desired, by the present operators. However, there should be no responsibility or commitment, either formal or implied, that funding would be provided to keep these ships operating. They would be used on an "as needed" basis.

(6) - It is proposed that the AII/ALVIN and JOIDES RESOLUTION operations continue as at present.

(7) - It is proposed that every attempt be made to use the new oceanographic ship in the Navy's FY87 budget as the first ship in this replacement plan.

(8) - It is proposed that the two most expensive and marginal research ships, the KNORR and MELVILLE, be laid up as soon as possible and that the funds budgeted for their operation, plus those being budgeted by the Navy to upgrade these ships, be pooled to build the second ship of the fleet.

(9) - It is proposed that the remaining three ships be provided through the Navy's ship replacement plan approved by the Secretary of the Navy. This should allow the new fleet to be in place in the 1990's.

A simple calculation will show that if the proposed fleet of five ships is operated 310 days a year, then the number of scientist/days at sea would be about equivalent to that provided by the fourteen existing UNOLS ships greater than 150 feet in length, which are now operated only an average 260 days per year. In essence, a fully employed small new fleet would have a greater capacity to take scientists to sea, and would also have better facilities that are properly utilized. Perhaps more

important, even at a conservative estimate, the operating costs of the new fleet would be only slightly more than 50% of the operating costs of the existing fleet of ships over 150 feet in length. And, the fleet could operate 90% of the time versus a present 71%. The cost per scientist/day at sea would be reduced from an average $455 to $234. Capital cost to acquire the new fleet and its equipment is estimated at $175-200M, assuming all ships are of the same class and built with commercial standards. (Numbers where appropriate are taken from UNOLS Fleet Replacement Committee report.)

Option 2

> An alternative to replacing the existing fleet with a newer, smaller, government provided fleet is to consider chartering industry ships on either a part or full-time basis. The JOIDES RESOLUTION is an excellent example how industry capability can be used by the academic community. By using this potentiality, major capital investments were avoided and the expertise and high technology of industry were put to use. In effect, it is a reverse technology transfer process in operation. Other areas of industry expertise should also be examined. The most obvious area is in exploration geophysics, where industry capability in multichannel seismics far exceeds that of the academic community. With the current downtrend in the oil business, some attractive long-term arrangements could easily be consummated. Scientists in many foreign countries are already taking advantage of this option, and the consequential loss of U.S. leadership in MCS research is becoming apparent. The Offshore Industry in the U.S. is highly developed. For the most part, the academic community has not taken adequate advantage of it.

Two somewhat different propositions have been put forward which might be used to upgrade the oceanographic fleet in a tight budget situation. These are neither unique nor mutually exclusive ideas. What they have in common is the concept of a shared-use national facility equally

available to all U.S. scientists. Further, because of the expense of these facilities, they will be limited in number and, therefore, it will no longer be possible to have one at each oceanographic laboratory in the country. It is this latter concept, which is so contrary to the past experience of the oceanographic community, that must be accepted if we are to maintain leadership. Other disciplines and other countries' marine science communities have already faced this challenge and made the decision to proceed the shared-use route. Some progress in this direction has already been made with the JOIDES RESOLUTION and ALVIN operations.

U.S. Oceanography faces a challenging situation. We can continue our existing course and plead for the funds necessary to allow us to maintain our leadership in marine science, or we can accept the reality that funds in the amount needed may not be available and begin to look at alternative solutions to maintain our excellence. The UNOLS Fleet Replacement Committee has catalyzed the situation with its excellent report. It is timely to follow through on their effort. The JOI Board of Governors, despite its obvious conflicts-of-interest, should face this problem squarely. Recognizing the concepts presented herein are controversial, their acceptance or rejection is not critical. What is important is the need to stimulate new ideas concerning this important problem. If we do not take the initiative, other groups, either in the academic community or in the Federal Government, are likely to resolve the problem to their own best interests.

April 8, 1986

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April 25, 1986

To UNOLS Executive Committee
Re Air travel and shipping for Oceanographic purposes
From J.M. Edmond, MIT

It is stating the obvious to say that, in the light of recent developments, shipping and, especially, hand-carrying scientific equipment and supplies by air is becoming extremely difficult and will stay that way. I thing we need to start devising ways to minimize the damage that this will cause to our operations, especially out of foreign ports, and to do this with some urgency. To kick things off I have several suggestions.

1) Fleet users need to be advised that, to the extent possible, "sensitive" materials to be used on expeditions to foreign waters should be loaded and off-loaded in US ports. This will require both long-range planning on the part of the individuals and a more formal vetting procedure by the operators. Hitherto gear has often been loaded at home ports solely to reduce the cost of shipping and indeed most ships leaving on extended cruises are filled to capacity. While this is to be encouraged, special priority must now be given to items that either plain cannot be moved by air legally or that are likely to be impounded by customs officials or airline personnel "just in case". Even a delay of a day or two for the latter reason can cause serious problems. My experience with Mexican customs, as paranoid a group as I have encountered, is that lower level people will not take responsibility for clearing non-routine items. This syndrome will probably become epidemic.

2) Reagents and other chemicals are perhaps the most sensitive items. As a matter of some priority the operators should be encouraged to install secure lockers for the extended storage of reagents and chemicals on all the ships operating in foreign waters. By secure I mean locked, with the Captain or Mate holding the key and the manifests of individual deposits. If security is not strict our distinguished colleagues will pilfer from each other and the scheme will not work. This locker should be in an air conditioned area and may need to include at least a small refrigerator or freezer.

3) I understand that the Department of Transportation does issue permits for the transport of otherwise prohibited items. I would assume that this writ runs only to US carriers. I think that it would be appropriate for UNOLS to facilitate the granting of such DoT permits to ship users. It would also be worthwhile to investigate the extent to which similar procedures exist in other countries so that bilateral agreements could be developed.

4) It should be impressed upon all concerned that breaking the law in this area could have very serious consequences for the individuals given the current atmosphere. We have all done it in the past. We had better stop.

adw