UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

UNOLS COUNCIL MEETING
January 29-30, 1991
RSMAS Library Map Room
RSMAS - University of Miami
Key Biscayne, Florida

UNOLS Council members, representatives from ONR, Office of the Oceanographer, NSF, NOAA, Department of State and the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, met at RSMAS, University of Miami, in Key Biscayne, Florida on January 29, 30, 1991. The meeting was called by Gary Brass, Chair, at 8:30 a.m., each day. Items on the Agenda (Appendix I) were addressed in the order presented herein.

ATTENDEES:

UNOLS Council

Gary Brass, UNOLS Chair
Tom Johnson, UNOLS Vice Chair
Larry Atkinson
Peter Betzer
George Grice
Feenan Jennings
David Karl
Mark Langseth
Ken Palfrey
Jim Williams

Observers, Participants

Christian Andreasen, NOAA
Tom Cocke, DOS
Pat Dennis, OON (JOI)
Don Heinrichs, NSF
Keith Kaulum, ONR
Bruce Rosendahl, RSMAS
Jack Bash, URI
Bill Barbee, UNOLS

Bruce Rosendahl, Dean, RSMAS, University of Miami, welcomed the Council and afforded members an opportunity to meet and confer with RSMAS faculty and staff.

The Council accepted the minutes for the July, 1990 Council meeting. (Minutes for the September, 1990 meeting were not available.)

COMMITTEE REPORTS

Research Vessel Operators Committee: Jim Williams, RVOC Chair, reported on the RVOC meeting, held October, 1990, in New Orleans. (Minutes for that meeting had been distributed earlier to the UNOLS community.)

The RVOC revised and adopted new bylaws. The revision was in part to establish consistency with the UNOLS Charter as revised and adopted in September, 1988, and also to formally establish some RVOC procedures. (E.g., the voting membership in RVOC is RVOC representatives from UNOLS member institutions who are operators.)

The RVOC endorsed and recommended to the UNOLS Council a revised Chapter 15, Diving Operations, for inclusion in the UNOLS Research Vessel Safety Standards, October, 1989. The draft Chapter 15 (Appendix II) refers to American Academy of Underwater Sciences' **Standards for Scientific Diving Certification and Operation of Scientific Diving Programs** as the authoritative standards for scientific diving operations, and establishes procedures governing participants from the ship operating institution as well as from the science party's and the diving party's institution(s).

After Jim Williams had discussed the workshops and other activities that had led to the development of improved procedures for diving operations from UNOLS ships and the draft Chapter 15, **The UNOLS Council adopted for inclusion in the UNOLS Research Vessel Safety Standards, the revised Chapter 15: Diving Operations.** The Council directed the UNOLS Office to distribute the revision.

In a related matter, the RVOC established a subcommittee to examine issues related to small boat operations (both in connection with diving and with other operations) and to develop recommendations and procedures for safe operations. The subcommittee had begun their work.

Copy for the UNOLS RVOC Safety Training Manual had been completed under contract to George Ireland and was awaiting publication. The **Safety Training Manual** is a comprehensive exposition of safety and training for UNOLS research vessel operations. Separates will be published for safety training and orientation of research vessel crews and for safety orientation of scientific parties and observers. Distribution is to be throughout the UNOLS community and among agencies sponsoring UNOLS.

The presence, use and disposition of Hazardous Materials aboard UNOLS research vessels was becoming a critical issue. RVOC proposes to address the issue as a part of their review of **UNOLS Research Vessel Safety Standards.** Hazardous materials, both substances used in vessel operations and materials used aboard ships for scientific purposes, are becoming much more strictly

regulated. Research vessels must comply with state, national and international regulations concerning transportation, storage, handling and disposal. **An RVOC review would address safety issues, inventory control, labeling, response guidelines, transportation and training, among other HAZMAT issues.** The UNOLS Council agreed that RVOC should undertake the study, urging that it be comprehensive within the scope of marine operations.

All UNOLS operators (even the smaller ones) are complying with U.S. Coast Guard regulations for drug testing. Regulations for random testing remain in abeyance, pending further judicial review. There have been no notable results from the testing programs in force.

The 1991 RVOC meeting will be in Victoria, B.C., Canada, hosted by the Institute of Ocean Sciences. Meeting dates are September 10, 11 and 12. Emphasis will continue on safety and training issues, on the hazardous materials study and on new navigation systems.

Keith Kaulum asked if the RVOC had reached a consensus on how to dispose of garbage. No universally-accepted solution had been found. Larger new ships are trying incineration, grinding, compacting and combinations. To date, there are constraints and limitations on all methods of disposal. **If and as solutions are found, they will be spread quickly among UNOLS Operators.**

ALVIN Review Committee: Feenan Jennings, Chair, reported on the **ALVIN Planning Meeting** held December 2, 1990, in San Francisco (Appendix III). Because of ARC concern in recent years over the falling rate of subscription, the format for the Planning meeting was revised. Half of the one-day meeting was devoted to submersible technology issues, and half to summarizing community interest that had been expressed in using ALVIN/ATLANTIS II during 1992 and beyond.

Steve Etchemendy, Monterey Bay Aquarium Research Institute, reported on the technology and operations of Soviet deep submersibles MIR I and II. The report, based on observations and dive participation by Steve and Bruce Robison, emphasized the technical quality and operational excellence of the MIR's. **The MIR submersibles are technologically superior to ALVIN in many aspects.**

Barrie Walden, W.H.O.I., reported on the status of the ALVIN program and directions for new development. He noted that not only the MIR's, but also the new Japanese submersible and support system may be superior to ALVIN in many respects. These new facilities provide strong competition for ALVIN. New developments were described for ALVIN video systems, still camera systems, film processing and lighting. The new data logger and bottom navigation systems were working well, and capabilities to tailor to individual investigator needs are impressive.

Documentation was needed so that routine applications can become standardized and, thus, fully operational.

Craig Dorman, Director, W.H.O.I., provided insight into the relative status of the U.S. program in deep submergence, together with ideas on how to maintain or regain pre-eminence. He asserted that the U.S. must stay in the forefront of submersible science. To do so, it will be necessary to quickly devise an effective plan that integrates all national efforts toward a national deep submergence program, a program including both manned and unmanned systems, appropriate depth capability and modern support ship(s). **He stressed the need for partnership among civil and academic interests and Navy efforts, both operational and development-oriented.**

Jeff Fox, ARC member, characterized community interest in using ALVIN. His summary for 1992 (and 1993) was based on notices of interest posted to the ALVIN.PLANNING electronic bulletin board or submitted directly to the ARC. **Although interest was not as high as it had been during the mid-1980's, it was substantial: Twenty-two notices of interest were received for 367 ALVIN dives in 1992-1993.** The ARC suggests that, based on the interest shown, a likely ALVIN/ATLANTIS II itinerary would be for work on the EPR (limits 13^{o}N to 22^{o}S) and then transit to the Atlantic for work in the Mid-Atlantic Ridge and nearby Gulf of Mexico and Caribbean areas. **Depending on strength of proposals and science funding decisions, a strong ALVIN/ATLANTIS II season appears likely.**

Council discussion centered on means for maintaining or strengthening interest in ALVIN-support science, for advancing a comprehensive national deep submergence program and for international cooperative efforts for the use of MIR's, SHINKAI 6000, NAUTILE and ALVIN. Don Heinrichs reported that international preliminary discussions had been initiated and that in addition to Soviet, Japanese, French and U.S. interest, British, German and perhaps Canadian participation would be probable. Discussion of a UNOLS role in helping to coordinate either a national or international cooperative program led to Council consideration of the recently-distributed UNOLS report **Submersible Science Study for the 1990's.** (The study had been accepted by UNOLS at the September, 1990 UNOLS Council meeting.)

Don Heinrichs and Keith Kaulum noted NSF and ONR reservations and, at the same time, relayed concerns from NOAA's Undersea Research Program concerning various aspects of the Submersible Science Study. Agency concerns **expressed to the Council** were with the broad role recommended for a permanent **UNOLS Submersible Science Committee.** The NOAA Undersea Research Program (NURP) had already initiated talks with Navy's OP-23 to explore mechanisms for scheduling SEA CLIFF, TURTLE and other Navy-operated deep submergence assets in support of the academic community. FOFCC is also exploring the issue of scheduling submersibles operating in support of Federally-sponsored research. A preliminary

proposal had been discussed on a project jointly sponsored by NSF and USGS to use MIR I and II off the Aleutians.

NSF and ONR saw other key issues raised by the **Submersible Science Study** in connection with **user community expectations for the scope and scale of future submersible science** as well as in **the development of mechanisms to facilitate the use of foreign deep submergence vehicles** (MIR's, NAUTILE, SHINKAI 6000). **NSF and ONR representatives were frank in saying that they would consider supporting a UNOLS Submersible Science Committee only if its role (and UNOLS' role) were well-defined and limited with respect to the comprehensive role envisioned in the Study** (see page 45, **Submersible Science Study for the 1990's.)**

The UNOLS Council decided to proceed in establishing a **UNOLS Submersible Science Committee.** They appointed a working group (Feenan Jennings, Gary Brass, George Grice and David Karl) to develop terms of reference for such a committee. After an interval for drafting, the working group made the following recommendation:

A UNOLS Submersible Science Committee should be established to:

- **monitor and promote the development and application of appropriate new technologies for submersible science,**
- **advise NSF, ONR, NOAA and other federal agencies on submersible technology, its evolution and applications,**
- **develop procedures for facilitating access to submersible systems by principal investigators of research proposals, and**
- **develop and exercise liaison among NURP, ARC, OP-23 and the oceanographic research community.**

The UNOLS Council endorsed those terms of reference, and **recommended that a UNOLS Submersible Science Committee be established.** (The UNOLS Charter specifies that permanent UNOLS committees be established by vote of the UNOLS membership and formed by the UNOLS Chair. (UNOLS Charter, paragraph 4f, Committees)). **The UNOLS Chair, after discussing candidates for the committee, noted that he would appoint an ad hoc Submersible Science Committee whose initial task would be to draft comprehensive terms of reference for presentation to the UNOLS membership at the next UNOLS Annual Meeting.** (A model would be UNOLS Charter Annexes I-IV.)

Fleet Improvement Committee: Mark Langseth, FIC Chair, reported on Committee activities, including their October, 1990 meeting. That meeting, at W.H.O.I., had bee chaired by Donn Gorsline, then FIC Chair.

In addition to Marcus Langseth, L-DGO, as FIC Chair, the Committee in 1991 has new members Peter Betzer, University of South Florida; Teresa Chereskin, Scripps; Charles Miller, OSU; and L. Donaldson Wright, VIMS. Continuing members are Bob Dinsmore, W.H.O.I., Ken Johnson, MLML and Tom Royer, University of Alaska.

FIC activities completed late in 1990 included:

- Publication and Distribution of the **UNOLS Fleet Improvement Plan,**

- Publication and distribution of **Conceptual Evaluation of a Research Submarine,**

- **Review of the draft AGOR-24 Circular of Requirements** (at the request of and for ONR, completed by a special working group chaired by Brian Lewis, UW), and

- Development of liaison with NOAA, Office of NOAA Corps and Operations, for fleet operations (CAPT. David Yeager will be the NOAA point-of-contact).

Keith Kaulum commented on the UNOLS/FIC review of the AGOR-24 COR. The ONR-end NAVSEA schedule for reaching a final COR did not allow much time for the UNOLS/FIC review. The working group's comments were received nearly on the deadline. The UNOLS/FIC recommendations to improve the AGOR-24 COR were to be considered by ONR for incorporation into the set of comments/recommendations forwarded to NAVSEA. NAVSEA and ONR decisions and agreements on AGOR-24 procurement and construction limited the scope of comments appropriate to the COR.

FIC activities in progress at the beginning, 1991 included:

- A working group under Roger Cook had been developing **Science Mission Requirements for a Submersible Support Ship,** and had submitted to FIC a preliminary draft. The FIC had reviewed the preliminary draft and requested revisions in format and substances. Roger Cook was developing a revision, as requested.

- Bob Dinsmore's efforts continued to compile a **Compendium for Small Research Vessels,** to contain information on desirable small-RV characteristics, conversion, layouts, etc. The **Compendium** was to be available during 1991.

- The FIC was helping to monitor the University of Alaska contract with Glosten Associates for a conceptual design for **An Arctic Research Vessel with Ice Capability for use in the Western Arctic.** Bill Barbee reported on a meeting held in Seattle on January 4, 1990. The meeting (Appendix IV), a 75% Design Review, laid out the Glosten design for a 208 ft. L.O.A. research vessel of about 2300 tons full load

displacement, 57 ft. beam with 5000 horsepower for displacement. The vessel would be of Ice Class 3 (i.e., about 3 ft. of level ice at 3 knots), and capable of operating in open seas as well as in ice. Further comparison with UNOLS **Scientific Mission for an Intermediate Ice-Capable Research Vessel** was provided in Appendix IV.

The Council raised questions about the level of experience in design of ice-capable ships that was being brought to bear in this conceptual design. Glosten Associates had retained Wartsila for advice on power requirements, a bobbler installation, and structural capability for ice operations.

The Council suggested that requirements to operate as a research vessel both in ice and in open seaways forced design compromises. They questioned that a vessel could be fully satisfactory in both regions. **The requirements to be capable of both in ice and open sea operations has been basic to the concept design effort from the beginning. Glosten Associates have been addressing both sets of requirements.**

Don Heinrichs, NSF/OCFS, had written to the University of Alaska and UNOLS (Appendix V). **The letter emphasized rigorous science mission requirements, especially the ability to work (with escort) in the central Arctic Basin, the ability to work in open ocean areas as well as in ice, capability for summer transits of the Northwest passage and to work in both the western and eastern Arctic. He suggested that the concept design should be ambitious rather than minimal.**

These concerns from NSF would, in effect, change the concept from a Class III (intermediate) to a Class II (large) UNOLS ship. The Glosten design would be stretched to a L.O.A. of 220-230 ft.

It was noted that an ice-capable research vessel for use in the eastern Pacific was in the Navy budget. Arrangements wherein that vessel could be used to support academic research programs and investigators were not assured, however. At this time, NSF feels compelled to plan as if their ship would be the principal asset for academic research throughout the Arctic.

- A study to determine the current value of UNOLS ships and the fleet was underway, led by Nowlin and Glosten Associates.

- Worth Nowlin, with support from Glosten Associates, was also working toward development of objective criteria for measuring and comparing seakeeping and seakindliness.

- The FIC Chair had just recently formed a subcommittee to evaluate a nuclear-powered submarine as a research platform. (The subcommittee had been formed, but had not yet met.)

SHIP SCHEDULING

Gary Brass and Bill Barbee reviewed the 1990 cycle of ship scheduling, especially the extraordinary **Schedule Review meeting** held November 14, 1990.

At the UNOLS **Ship Scheduling meeting**, held June 25, 1990, estimates of total 1991 ship use and costs were for 5,901 days and over $53 million. These institution estimates would have resulted in a shortfall of over $12 million. Further, those estimates included over 2,000 days and $17.3 million for work whose science funding was still pending. (Most of those pending projects had been submitted to NSF.) During the June, 1990 **Schedule Review** meeting, letter recommendations were developed for each UNOLS ship and institution. The thrust of the recommendations was to enhance schedule efficiency, reduce fleet operating costs and alert operators that only about one-third of all pending projects would likely be funded.

Operator estimates presented at the September 19 **Ship Scheduling meeting** still totaled $50.8 million and 5,600 days. Those costs and levels of use were still about $10 million and over 1,000 days beyond available resources. Unforeseen and unexpected delays in KNORR and MELVILLE availability were impacting some critical NSF and ONR programs. In addition, agencies did not yet have their FY 1991 appropriations, and many science-funding decisions had not yet been made or announced. Letter recommendations were developed that, as a set, refined schedules, eliminated not-to-be-funded projects and reduced fleet use to about 4,450 days costing $41.5 million (NSF share 2,927 days, $28.5 million). Schedules following those recommendations were satisfactory to the funding agencies.

By late October, it was clear that MELVILLE and KNORR would be delivered much later than earlier expected and contingencies would be necessary to support critical NSF and ONR science (e.g., WOCE and ML-ML). Further, a summary of Ship Operations proposals totaled 4,826 days, $46.3 million (NSF share 3,274 days, $33.3 million). A third **Schedule Review meeting** was set for November 14, 1990, at which time a final set of schedule recommendations was developed. This set of recommendations was to reduce 1991 ship operations to about 4,500 days costing $40.9 million (NSF share 2,975 days at $28 million). The nature of recommendations for the fleet are in Appendix VI, excerpts from letter recommendations on UNOLS fleet schedules.

In discussing the 1991 ship scheduling cycle, **NSF and ONR representatives noted process improvements over recent years, and expressed their satisfaction.** The late date for many science funding decisions and for final agency budgets prevented setting final ship schedules in a more timely fashion. Hopefully, with newly-adjusted science proposal target dates, funding decisions can be announced earlier in 1991. **The UNOLS Council endorsed the ship scheduling process as followed in 1990. They agreed that**

- The FIC continues to monitor progress toward mid-life refits for OCEANUS-class intermediate ships. Jack Bash is project-FIC liaison.

FIC activities to be undertaken in 1991 included:

- A Committee meeting would be held in New Orleans during April. The FIC expected to visit the MELVILLE and KNORR, the PALMER and the THOMPSON during their meeting.

- FIC would begin a review of UNOLS fleet (and other?) capabilities to support an expanded, multi-agency program in coastal oceanography. This review would be in response to the UNOLS Council charge (at their September 19 meeting) to define coastal zone research vessel requirements. The interface/interaction with parallel UNOLS Council activities to solicit agencies in addition to NSF and ONR for commitment to support the UNOLS fleet in coastal work had yet to be defined.

- The FIC would continue their evaluation of SWATH ships designed and built for research. Discussions between W.H.O.I. and NOAA concerning design, construction and operation of a large SWATH will be followed. W.H.O.I. had completed evaluation of the 181' Japanese SWATH KAIYO for the Office of the Oceanographer. Although it has been difficult to get releases for much of the report, W.H.O.I. expects to be able to make reports available to FIC on the various activities conducted aboard KAIYO.

- The Committee will initiate a study to estimate 1995 annual operating costs for the UNOLS fleet. There is interest and concern in the oceanographic community as to what operations costs will be for the academic fleet in the mid 1990's. New, larger ships, additions to the fleet, changes in the cast of sponsors and changes in program emphasis are among factors causing concern.

- The FIC will examine questions on the significance of potential new (non-UNOLS) ship capabilities for supporting academic research. Prospects for ships and platforms such as commercial build-lease-operate ventures (e.g., the PALMER), use of foreign research submersibles (e.g., MIR I and II, NAUTILE, SHINKAI 6000) and Navy-operated submersibles and support ships (e.g., SEA CLIFF and TURTLE operating from the LANEY CHOUEST) could affect the traditional UNOLS mode of institution-operated research ships. An inventory of such platform capabilities with use profiles might be a useful first step in analyzing this issue.

Schedule Review meetings were essential. They instructed that, during 1991, UNOLS fleet schedules be developed as early as practical, as models to be advanced at Schedule Review meetings.

Ken Palfrey, Ship Scheduling Committee Chair, noting that since the final science proposal target date involving 1992 ship operations was May 1, 1990, **Ship Scheduling meetings** could be held in mid-June, with **a Schedule Review meeting** in late June or early July. Fall **Ship Scheduling** and **Schedule Review meetings** could be held earlier in September than in recent years. He proposed a calendar wherein **regional ship scheduling meetings for ship operations in the Atlantic and the Pacific would be held during the weeks of June 10 and June 17, in Atlanta and San Francisco. A Schedule Review meeting would follow in Washington, D.C. in late June or early July. A Ship Scheduling meeting for all of UNOLS would be held in early September, with the Schedule Review meeting soon after.**

UNOLS ISSUES

Fleet Management: Tom Johnson had provided a letter report (Appendix VII) on four issues identified in the **1990 UNOLS Fleet Improvement Plan:** designation of UNOLS vessels, classification of UNOLS vessels, definition of a full working year and small vessels for the UNOLS fleet.

The Council agreed that current criteria for designating a research vessel into the UNOLS fleet are appropriate. The thrust of these criteria is to assure sponsored users that a vessel is reasonably capable to support oceanographic research, operates in accordance with suitable safety standards, is available to qualified, funded users and employs consistent use charges and accountability for Federal sponsors.

At the same time, the Council recognized that the vessel-designation criteria do not effectively restrict entry into the fleet or control the size of the UNOLS fleet. Keith Kaulum, for ONR, was especially concerned that more and more non-federally owned/acquired ships might enter the fleet, thereby spreading resources too thin, compromising Navy efforts to justify and acquire new ships for the fleet and overburdening limited federal budgets for ship operations. He noted that ONR already effectively follows policies based on two tiers of vessels in the academic (UNOLS) fleet. They feel obligated for continuing support only to the core of UNOLS vessels owned by federal agencies or acquired by government funds; they support other UNOLS vessels only as they have program needs for them.

The Council position remained that UNOLS had no justifiable basis for limiting the entry of qualified vessels into the UNOLS fleet. Although Federal sponsoring agencies might adopt a funding policy favoring government-owned ships, it was not appropriate for UNOLS to codify a two-tiered vessel-designation system. The Council also noted that the three non-Federal vessels recently designated

into the UNOLS fleet are supported largely by funds other than from NSF or ONR. They have had no significant impact on traditional NSF/ONR ship operations funds.

The Council directed that the Executive Secretary assemble a set of guidelines for requesting that a ship be designated a UNOLS vessel.

In discussions on UNOLS classification of ships (by length, by special capability, etc.), it was noted that UNOLS had, several times, attempted to devise ship classification schemes that would reflect research capabilities, be useful in cost comparisons or otherwise aid in fleet management. None of these past efforts had been fruitful. The current scheme, based on length, has the advantage of being consistent with that employed by FOFCC. Serious analysis of research fleet capabilities and costs must always recognize individual ship/institution differences in capability, outfitting, mode of operation, area of operation and principal use. **The Council agreed that the length-based system has some utility if care is taken. No great benefit was seen in trying to devise a more elaborate scheme to classify UNOLS research vessels.** It was noted that the **Fleet Improvement Plan** uses **Scientific Mission Requirements** as a classification scheme effective in comparing design specifications for new construction, recommending the appropriate mix of ships for fleet planning and other management purposes.

Although the Council discussed the question of **full working years** for UNOLS ships, they agreed only that the currently used definition for different length classes (the RVOC definitions) were too simplistic. An efficient level of ship operation is nearly an individual ship/institution determination, based on many factors. **Tom Johnson agreed to continue on the problem by trying to define cost efficient levels of operation for individual ships or groups of ships.**

The need for consideration of smaller vessels in the **UNOLS Fleet Improvement Plan** is closely related to renewed emphasis among Federal sponsors in coastal oceanography programs. The Council had, at its September 20, 1990 meeting, agreed that UNOLS should make an effort toward defining the coastal oceanography program needs for research vessels among several federal agencies in addition to NSF and ONR. UNOLS should then seek ways to foster among the several Federal agencies together with states and local authorities a coordinated approach to providing research vessels and facilities to support the multi-agency coastal ocean program. (A realistic plan to use UNOLS or other university-based ships and facilities would require commitments from participating agencies and authorities for continuing ship and facilities support; ad hoc purchasing of ship time would not be satisfactory.) Once the scope of ship requirements was determined, a mix of ship sizes, capabilities and modes of operation could be developed that would be responsive to multi-

agency needs. Individual ships and ship designs should be developed as a parallel effort.

Peter Betzer had made preliminary inquiries of USGS and found some interest there in using UNOLS ships in global programs. NOAA representatives had made inquiries through NSF on the short-term availability of UNOLS ships to support Global Climate research (Appendix VIII). **Peter Betzer and Larry Atkinson agreed to follow up with USGS and NOAA and to contact DOE, EPA and MMS relative to agency interest in and need for UNOLS ship time. Emphasis would be on coastal program use.**

The Johnson report suggested appointing a committee to address small vessel/coastal program issues. The Council deferred, and determined to keep these issues within council purview, at least until a firmer course of action is determined.

SHIP CONSTRUCTION AND RENOVATION

Keith Kaulum reported that construction continued to go very well and on schedule on the **THOMAS G. THOMPSON.** At meeting time, the delivery date was scheduled for July 9, 1991. Following about three weeks for post-delivery availability and a 30-day scientific shakedown, the THOMPSON will be available for operations. About two months' availability will be required in 1992. Although there have been minor problems, the Navy sees the THOMPSON to be a well-designed, well-constructed, highly-capable research vessel. The schedule, set at the beginning of construction, was holding.

Renovation projects on the **KNORR and MELVILLE** were not as satisfactory. Resolution of this issue is ONR's top priority. A complicated set of factors had contributed to construction delays and, in some instances, poor quality work: Analyse indicate that the yard underbid the project and underestimated the complexity of the two renovations. There had been systematic disagreement as to what work was specified. Quality of some of the work may not be satisfactory. Surveys (for the yard or for program managers) indicated that KNORR was 85% and MELVILLE 45% completed. **Estimated delivery dates were for KNORR, early June, 1991 and for MELVILLE, September to November, 1991.** There was more assurance on the KNORR delivery date than on MELVILLE's. Resolution of cost issues was in process, among McDermott, ONR, Scripps and W.H.O.I.

Don Heinrichs, NSF, noted that the **EWING** was in operation. The vessel had completed the NSF/ABSTECH ship inspection. The EWING had been declared operationally fit and seaworthy, although recommendations had been made that L-DGO re-determine the ship's stability and refine stability documentation.

Don Heinrichs alerted the Council that, in response to findings during some recent ship inspections, NSF would ask UNOLS to examine the inspection process. In particular, NSF would ask for

review of the nature of inspection reports, of the treatment of recommendations made in reports and of means used to reflect results of inspections in declaring operational fitness and seaworthiness. **The Council was receptive, and would expect a charge from Dick West, manager of the NSF ship inspection program.**

NSF may also ask for a review (not necessarily a part of the inspection program) of all UNOLS ships to determine the level to which laboratory spaces and layouts, and scientific outfitting are being maintained as quality research facilities.

NSF had declined a proposal for re-engining and refitting the WARFIELD. A decision on the proposal for additional conversion to the WEATHERBIRD II was still pending.

The Council was informed that arrangements for the University of Hawaii to operate the **POWELL** as support ship for the HOTS project had been dropped. Later arrangements were that **POWELL** would support Jim Brooks projects in the Gulf of Mexico.

FEDERAL AGENCIES

Keith Kaulum recapped the recent history of ONR's funding for ship operations in support of academic oceanography. In 1988, the first year during which ONR allocated $5 million directly to ship operations, ONR spent $8.5 million for all ship operations. In 1989, ship operations funding decreased to $5.5 million, but since has climbed to an estimated $7.5 million for 1991. Not all of these funds go for UNOLS ship time; special requirements (e.g., acoustic source ship for the Heard Island experiment, SRP and some Arctic programs) have used Chouest or other ships. (ONR funding to the UNOLS fleet, not including ALVIN, was about $5.6 million in CY 1988 and is projected at about $6.5 million in CY 1991.) **The ONR program for funding ship operations (the formula wherein program managers partially match facilities funds on a project-by-project basis) was to continue.**

ONR programs and funds for FY-1991 were not affected by Operation Desert Storm. No changes had so far been announced for FY-1992, either.

ONR has decided to retire the GYRE in 1991. TAMU will be free to try to acquire the vessel, if they choose, through prescribed surplus procedures. **ONR also expects to retire the WASHINGTON in 1992. They also are looking to increased use of Remotely Operated Vehicles, ROV's, such as ARGO-JASON as alternatives to ALVIN for support of undersea science.**

Pat Dennis reported for the Office of the Oceanographer that, just recently, both AGOR-24 and OON's T-AGS, ice-capable ship had been reinstated in Navy's FY-1992 budget request. (Since the budget was to be delivered to Congress on February 4, there was strong assurance that award and construction would proceed.) The

Navy's research and survey ship acquisition program status is: two ships built and delivered, three under construction, contracts for two ready to be awarded and two in the 1992 budget. Tentative plans to complete the program would include a SWATH and a T-AGS 3 in 1993 and AGOR-25 and one additional ship in 1994.

ONR was reviewing their draft Request for Proposals to operate AGOR-24 or AGOR-25. They expected to issue the RFP soon.

Don Heinrichs took the opportunity to review NSF/OCE's 1991 budget at this first UNOLS meeting since the budget had been secured. A set of budget slides are reproduced in Appendix IX. In NSF overall, research and related activities grew by $101 million, 6.4%. The Geosciences Directorate received increases of $42.7 million, 13.1%. Ocean Sciences were increased by $17.4 million, 11.8%, to $164.8 million. Increases for OSRS, OCFS and ODP were $9.2 million and 12.5%, $5.3 million and 12.4% and $3.0 million and 9.4%. In Ocean Sciences, emphasis was on Global programs, which increased $14.0 million as compared to $3.4 million for core programs.

NSF's FY-1992 budget submission, to have been released on February 4, 1991, looked favorable to OCE, with an increase of more than 10% over 1991. Increases were expected to be divided about 50-50 between Global Change and core programs.

Don Heinrichs also raised a number of issues with and for UNOLS:

The first set dealt with planning for the academic fleet and issues addressed in the **UNOLS Fleet Improvement Plan (FRP).** These are summarized in Appendix X. When the **FRP** is reflected against agency planning and assessments, the conclusion is that UNOLS (academic) fleet needs for **large ships** are essentially met by 1994, when AGOR-24 would enter service. The question of a submersible support ship could be resolved with AGOR-25 replacing ATLANTIS II in that function. Minor adjustments should be made between the **FRP** and agency plans and assessments.

The **FRP** match to agency planning relative to **intermediate ships** raises a number of basic questions. **FRP** justification for the number of intermediates needed in the late 1990's and beyond is not compelling. Program demand for intermediate ship time may have declined; institution-owned intermediates have been recently added to the fleet. The geographic distribution of intermediates needs to be determined. Intermediates will all grow old together in 2000 to 2010.

The **FRP** does not address **small ships** adequately. The potential for significant levels of support from agencies other than NSF and ONR and from states must be verified and secured. A fleet model must be defined for a mix of ships (and modes of operation) to effectively address multi-agency requirements in coastal, regional and estuarine oceanography. Only then can ships be specified and concepts drawn.

An ice-capable research vessel for Arctic research is the highest priority in NSF's planning for ship construction. The intermediate ship identified in the **FRP** may not have sufficient capability to meet Arctic requirements.

In general, UNOLS planning for the 1990's has been based on response to NSF and ONR programs. Potential demand from NOAA and other agencies, in both global and regional programs, should be assessed and reflected in UNOLS plans as warranted.

The recent review of OCE by a Committee of Visitors included some findings pertinent to UNOLS:

- Ship scheduling should continue as in 1990,
- Shipboard technician proposals should be reviewed by panel. Charges for shipboard technicians should be summarized and made available to potential users,
- Criteria for ownership of shipboard equipment should be determined and inventories made of individual ship's equipment, as basis for assessing shipboard equipment needs,
- Future ship acquisition and planning for acquisition should consider impacts on the existing fleet,
- Future planning should consider explicitly how a planned, improved fleet's ship operations would be funded, and
- Ship retirements, lay-ups and attending personnel lay-offs are issues.

NSF may also ask, through RVOC, that the question of a fleet-wide ship insurance program be reopened. Many operators have recently experienced drastic rate hikes, and saving through a club or some other alternative might now be beneficial.

Dolly Dieter had agreed to remain in NSF as Manager, Ship Operations, for an additional two years.

Chris Andreasen, soon-to-be Deputy Director, NOAA, ONCO, reported that of NOAA's 1991 increases of $38 million for Global Climate and $11 million for Coastal Oceanography, no funds are earmarked for fleet operations. The NOAA fleet is, essentially, level funded for 1991. (I.e., some ships will remain inactive, overall levels of operations will be about the same.) **Fleet modernization would target the FY-1993 budget.**

Especially for the ship operators present, ADM. Andreasen discussed NOAA progress in digitizing their nautical charting base for use in electronic charting (for navigation) and other purposes.

Tom Cocke, Department of State, discussed his program to address late submissions of research vessel clearance requests. A draft **Notice to Research Vessel Operators (Appendix XI)** included the forthright letter that he had begun to use in response to these late submissions. His compilation of dates of submission of clearance requests in 1989 and 1990 was ample evidence of the need for strong action. **The Council assured Tom that they agreed that a strong response was needed and that his letters to P.I.'s and operators were receiving attention and should improve the situation. He was urged to issue the NTRVO.**

Patsy Brown is Tom's new assistant for clearances.

UNOLS BUSINESS

The UNOLS Council selected Larry Atkinson and Ken Palfrey to serve with Gary Brass and Tom Johnson as Executive Committee for 1991.

On the election of Gary Brass as UNOLS Chair (in September, 1990) his position on the UNOLS Council, from among designated representatives of UNOLS Operator institutions lapsed. The Council, designated as a UNOLS nominating committee selected candidate-nominees to fill the remainder of the Brass term (until September 1991). The executive secretary was directed to contact these nominees and hold a telemail election among those willing to stand for Council membership.

George Grice had suggested that in 1991, UNOLS' twentieth year, it might be appropriate to review UNOLS, its policies, activities, procedures and performance. The Council agreed in principal that such a review should be made; they formed a working group of George Grice, Gary Brass and Jack Bash to write a charge, suggest a mode and structure and suggest potential chairs for a review of UNOLS.

The Council discussed UNOLS News, and whether or not to revive or continue it. It was agreed the UNOLS News should continue, and should include regular input from the Council and Committee Chairs. It should also publish calendars of UNOLS meetings and activities. The UNOLS Executive Secretary should be editor at least for the time being.

The meeting was adjourned at 1:15 p.m., January 30.

AGENDA
UNOLS COUNCIL MEETING
January 29-30, 1991
Map Room
RSMAS Library
8:30 a.m.
RSMAS - University of Miami
Key Biscayne, Florida

Call the Meeting: Gary Brass will call the meeting.

Accept Minutes of July and September 1990 Council meetings.

COMMITTEE REPORTS

Research Vessel Operators Committee: Jim Williams, Chair, will report on October, 1990 RVOC meeting and on other RVOC activities and issues. 1991 RVOC meeting. A revised Chapter 15, UNOLS R/V Safety Standards, covering Diving Operations, will be introduced for Council endorsement. Jim Williams will alert Council to an RVOC-initiated study on shipboard handling of Hazardous materials.

ALVIN Review Committee: Feenan Jennings, Chair, will report on status of ALVIN program, December 2, 1990 ALVIN Planning meeting and the projected program for 1992. **The report Submersible Science Study for the 1990's has earlier been distributed. Discussion of issues raised in the report, especially concerning UNOLS roles, appropriate committee structure for comprehensive submersible activity.** UNOLS or Council action, as appropriate. ARC meetings in 1991.

Fleet Improvement Committee: Marc Langseth, Chair, will report on FIC activities and agenda for 1991 (as reached at October, 1990 FIC meeting). Issues concerning a western Arctic ice capable research vessel for the UNOLS community: the FIC working group meeting on Arctic R/V design (report by Barbee); the effort to meet research community needs by means of a lease/contract to construct and operate (analog to NATHANIEL B. PALMER). UNOLS/FIC review of the AGOR-24 COR at behest of ONR. FIC working group on Scientific Opportunities to Use Nuclear power submarine.

Ship Scheduling Committee: Ken Palfrey, Chair, will review Committee plans for the UNOLS cycle of scheduling to develop 1992 schedules. Calendar of SSC and Schedule Review Meetings. Gary Brass and Bill Barbee will report on the November 14 Schedule Review meeting called to refine 1991 schedules and match 1991 ship operations to agency funding.

UNOLS ISSUES

Fleet Management: Follow-up on Council analysis of Class IV ships/ship operations in the Mid-Atlantic. Related issues identified in the Epilogue, 1989 Fleet Improvement Plan. At the September, 1990 UNOLS Council meeting, Tom Malone provided a brief report from the Mid-Atlantic operators. The Council accepted that report. Concurrently, a Council working group, Tom Johnson, Peter Betzer and Mike Rawson had provided a preliminary report on issues raised in the Epilogue. The Council had agreed that some overlapping issues (criteria for designation as UNOLS ship, relating UNOLS fleet size to projected ship needs, other-agency sponsorship of ship acquisition/ship operations to support coastal ocean research) should be followed up. A working group, Peter Betzer, Tom Malone, Donn Gorsline, was to begin to develop a UNOLS position vis-a-vis agencies in addition to NSF, ONR (e.g., NOAA, EPA, USGS, MMS, DOE) and begin to establish agency contacts relative to ship acquisition/operational support. The FIC will also look at some of these issues.

Ship Construction and Renovation: Report on construction status of T.G. THOMPSON, renovation of KNORR, MELVILLE and budgetary status of AGOR-24, AGOR-25. Availability dates for THOMPSON, KNORR and MELVILLE, and how those dates will affect 1991/1992 operations.

Remarks from Federal Funding Agencies: Information from Federal agency representatives (ONR with OON, NSF, NOAA, DOS, others). Tom Cocke, DOS, will discuss new policy on late submission of clearance requests.

UNOLS Executive Committee: The EC consists of UNOLS Chair, Gary Brass; Vice Chair, Tom Johnson; and two members selected by and from the UNOLS Council from either elected or ex officio members. Last year's EC members from the Council were Gary Brass and Worth Nowlin. Council select two EC members for 1991.

A UNOLS Review: UNOLS will be 20 years old in 1991. It has been suggested that an external review might be appropriate to assess past performance, suggest changes in activities, procedure, etc. Discussion on how or if such a study should be undertaken.

UNOLS News: What to do about/with it?

Cruise Assessments: Summary for 1990 operations.

with the cruise dive plan. He or she has the authority to restrict or suspend diving operations and alter the cruise dive plan in consultation with the Master and the Principal Investigator/Chief Scientist. The On-Board Diving Supervisor's responsibilities include:

A) Meeting with the Master and Chief Scientist to review the cruise dive plan and emergency procedures prior to diving.

B) Remaining in regular communication with the Master on the progress of the research diving operation.

C) Assuring that both the lead and operating institution's diving manual are available to the scientists and crew aboard the vessel.

D) Inspecting high pressure cylinders and breathing air compressors to assure that they meet the lead institutions' standards.

5) Research Divers must recognize their individual responsibility for their safety.

Draft UNOLS Shipboard Safety Standards

15: Diving Operations

15.0 Policy: Scientific diving is a normal part of oceanographic research vessel operations. Such diving conducted from a University National Ocean Laboratory System (UNOLS) vessel must be under the auspices of a diving program that meets the minimum American Academy of Underwater Sciences' (AAUS) *Standards for Scientific Diving Certification and Operation of Scientific Diving Programs*.. Operators without a program may accommodate scientific diving cruises which are under the auspices of an institution with such a diving program.

15.1 Diving Procedures, Rules and Regulations: For all cruises a single lead institution's campus diving administration will be designated. This is usually accomplished by agreement of all campus diving administrations involved. Items which refer to the campus diving administration may, in fact, be the concern of the Diving Safety Officer according to the practices of the institutions involved. The procedures, rules and regulations that govern the diving operation are those of the designated lead institution, subject to the approval of the operator's Marine Office.

15.2 Cruise Planning: In a timely fashion prior to the cruise:

1) The Principal Investigator will insure that a cruise dive plan is supplied to his or her campus diving administration who will forward the cruise plan, once approved, to the lead institution's campus diving administration. The dive plan, prepared in a standard format includes: diving credentials for all diving members of the scientific party, detailed operational plans, emergency plans including accident management and emergency evacuation protocols, a list of needed medical supplies, a specified quantity of medical grade oxygen with a positive pressure demand delivery system, and required diving support equipment (e.g., small boats).

2) The lead institution's diving administration will, after approving this plan, forward it to the operator's Marine Office.

15.3 Cruise Personnel:

1) The Master has responsibility for the safety of all activities aboard including diving (Section 13.4).

2) The Chief Scientist is responsible for the co-ordination and execution of the entire scientific mission (Section 13.5).

3) The Principal Investigator of the diving project (who may or may not be the Chief Scientist) is responsible for the planning and co-ordination of the research diving operations.

4) The On-Board Diving Supervisor will be proposed by the Principal Investigator and approved by the lead institution's diving administration. The On-Board Diving Supervisor is responsible for the execution of the research diving operations in accord

ALVIN PLANNING MEETING
San Francisco, California
December 2, 1990

A meeting was held on December 2, 1990, in the Crystal Room, Holiday Inn - Golden Gateway, San Francisco, California to gain planning information for ALVIN/ATLANTIS II operations in 1992 or later.

The meeting was called by Feenan Jennings, ALVIN Review Committee Chair, and followed the agenda in Appendix I.

The meeting was attended by:

ARC Members:
Feenan Jennings
Jeff Fox
Casey Moore
Doug Nelson
Mary Scranton
Gary Taghon
Karen Von Damm

Agency representatives from NSF, ONR and NOAA attended as did about 25 previous and prospective ALVIN users.

An underlying theme of the meeting was that, even though ALVIN remains the most effective research facility in the U.S. oceanographic program, it has not been fully subscribed in recent years. Further, there is evidence that Japanese, French and Soviet deep submersibles have outstripped ALVIN technologically. **The ALVIN Review Committee believes that only with enhanced planning, development and operations can the ALVIN/ATLANTIS II program help to preserve U.S. leadership in deep submergence research.**

Steve Etchemendy, Monterey Bay Aquarium Research Institute, reported on the technology and operatives of the Soviet deep submersible MIR I and MIR II. The presentation was in two parts: a user's perspective based on a dive in MIR I by Bruce Robison, MBARI; and Steve's own observations of shipboard operations and support, providing an engineer-pilot's perspective.

The report (see Appendix II) emphasized the technological quality of the MIR's and the excellence of the overall operation. **The MIR submersibles are technologically superior to ALVIN in many aspects:** depth to 6,000 meters, more available power, more speed, greater endurance, better visibility and lighting, more comfortable, better internal layout, excellent cameras and video, excellent manipulator arm, and excellent maneuverability. ALVIN's superiority lies in its suite of specialized tools and samplers and the superior responsiveness of pilots, based on cumulative operational experience.

Launch and recovery (as well as other operational) protocols for the MIR's are sound and efficient. Pilots and support staff are competent and professional. The Soviets are marketing their submersibles aggressively. They are offering one or two dives per day at a rate of about $20,000 per day.

Craig Dorman, Director, Woods Hole Oceanographic Institution, addressed the meeting providing insight into the relative status of the U.S. program in deep submergence together with ideas on how to maintain (or regain) pre-eminence.

Soviets, as well as Japanese and French, have each adopted a national approach and commitment to deep submersibles, and each have achieved excellent, well-integrated facilities. It is critical that the U.S. stay in the forefront of submersible science. To do so will require excellent planning within approximately one year to define the appropriate facility with the appropriate mode of civilian (academic) control. By about 1992-1994, detailed requirements will be needed for: depth capability, mix of manned and unmanned vehicles, support ship(s), technical development of tools and mode of operation. A partnership must be developed with the Navy if an integrated facility plan is to address the civil, academic community's scientific research requirements and the Navy's national security or operational requirements. A single, well-integrated facility to address both sets of requirements seems to be the only hope to meet the U.S. science community's needs for research submersibles and to keep pace with Soviet, Japanese and French developments.

Barrie Walden, WHOI, reported on the status of the ALVIN program and directions for new development. He agreed that the MIR submersibles were excellent and superior to ALVIN in many respects. The new Japanese submersible and support system may be even better. These new facilities provide strong competition to ALVIN.

ALVIN is not currently oversubscribed. In fact, schedules have not been full since 1988.

New developments and improvements were described for video systems, still camera systems, film processing and lighting. Some of the new systems are not working as well as they should, but are being reworked.

The new data logger is working well, and the capability to tailor to individual scientist's needs is impressive. Documentation is needed for standard formats, etc., and is being developed.

Feenan Jennings discussed ARC recommendations for 1991 operations and the developing schedule. In June, 1990, the ARC recommended 15 of 21 ALVIN dive requests received. The 151 dives recommended, together with a 28-day non-ALVIN project, makes for a nine-month (January-October) ATLANTIS II schedule in the northeast Pacific. The ALVIN/ATLANTIS II schedule is on UNOLS' OMNET bulletin board SHIP.SCHED91.

Jeff Fox, ARC member, characterized notices of interest in using ALVIN. The notices of interest, posted to the ALVIN.PLANNING bulletin board or submitted directly to the ALVIN Review Committee, are summarized by region in the following table and in more detail in Appendix III. The center of interest for 1992 is on the Mid-Atlantic Ridge and nearby Bahamas and Gulf of Mexico areas. Other significant interest was shown in work on the EPR (and the nearby Volcano 7) from about 13°N to 22°S. Other areas of interest in 1992 include Gorda-Juan de Fuca, vicinity of Hawaii, the Lau Basin, Gulf of Alaska, and Southern Ocean.

A set of projects are being developed for the Mediterranean in 1993.

NOTICES OF INTENT BY REGION

December 2, 1990

FOR 1992

MID-ATLANTIC RIDGE

2. Karson	G&G	20
4. Elderfield	Geochem	20
3. Lutz	Bio.	10
17. Bryan	G&G	20
19. Rona	G&G	20
22. Van Dover	Bio	25
		115

NORTHERN EPR AND SEAMOUNTS

3. Lutz	Bio	5
10. Childress	Bio	28
11. Wishner	Bio	25
21. Edmond	Geochem	5
		63

HAWAII

6. Garcia	G&G	7

GORDA-JUAN DE FUCA

3. Lutz	Bio	5
8. Davis	G&G	24
16. Collier	G&G, Chem, Bio	17
		46

SOUTHERN OCEAN

3. Lutz	Bio	5
12. Lawver	G&G	21
		26

FOR 1993

MEDITERRANEAN

1. Ullman, Kastens	Inter-disc	12
15. Druffel	Bio	4
XX Camerlenghi, Cita	G&G	?
		16-?

GULF OF MEXICO - BAHAMAS

7. Flood	G&G	15
13. Roberts	Geochem	15 (?)
14. Mullins	G&G	10-12
		42

SOUTHERN EPR

3. Lutz	Bio	10
5. MacDonald	G&G	10
21. Edmond	Geochem	10
		30

GULF OF ALASKA

9. Highsmith	G&G	20 (?)

WESTERN PACIFIC

18. Hawkins	G&G	18

TOTAL DIVES OF INTEREST: 367*

*Includes alternates in Notices of Interest to work at any of several sites.

Based on the interest shown, the ALVIN Review Committee suggests that a likely 1992 itinerary for ALVIN/ATLANTIS II would be to take up work on the EPR (within the limits 13°N to 22°S) in January-May, then transit to the Atlantic for work in the Gulf of Mexico, Caribbean and on the Mid-Atlantic Ridge for the rest of the year. The pressures of excellent science and funded proposals will control the details of 1992 schedule recommendations.

APPENDIX IV

AGENDA

Meeting at The Glosten Associates, 9:30 AM, 4 January 1990

POLAR RESEARCH VESSEL

75% Design Review

1. Design Status
   Summary of the 75% design status. Discussion of how the vessel meets (or does not meet) the requirements contained in "SCIENTIFIC MISSION FOR AN INTERMEDIATE ICE-CAPABLE RESEARCH VESSEL" as well as the requirements discussed at the 18 September kick-off meeting.

2. Ice Capability
   Discussion by Wartsila of the estimated power needed to meet the requirement of 3 kts in 3 ft of level ice. Also, a discussion of possible ice resistance reduction from a bubbler installation as well as some ideas concerning overall power utilization. Review of structural capability.

3. Sea-keeping
   Discussion of the philosophy behind the selection of principal hull dimensions and their impact on sea-keeping properties. Comment on the sea-keeping criteria contained in the SMR and how well we think this vessel will meet those requirements.

LUNCH

4. Remaining Design Tasks and Subjects for Future Analysis
   Discussion of what tasks remain and possible future analysis work to consider (model tests).

5. Round Table Discussion

ATTENDANTS

The Glosten Associates
Larry Glosten
Duane Laible
Tom Bringloe
Bruce Hutchison
Don Field
Dirk Kristensen

UNOLS FIC
Bob Dinsmore
Knut Aagaard
Bill Barbee

UNOLS/FIC
University of Alaska
Vera Alexander
Bob Elsner
Tom Royer

National Science Foundation
Dolly Dieter

Wartsila Marine
Peter Noble
Mark Dabell

ARCTIC RESEARCH VESSELS
Comparative Vessel Data

	UNOLS Reqmnts	Glosten PRV	R/V ARANDA	R/V NATHANIAL PALMER	T-AGS OCEAN (ICE)
Length, Overall	150'-199'	208.5'	193.6'	308.5'	337.4'
Length, Waterline		192.0'	171.3'	279.7'	318.0'
Beam, Maximum		57.0'	45.3'	60.0'	58.0'
Depth, Freeboard Deck		19.5'	22.0'	31.0'	28.0'
Draft, Design Waterline		13.5'	15.1'	21.8'	18.0'
Displacement, @ DLWL		2,286 LT	1,772 LT	6,500 LT	4,848 LT
Ice Classification	Class 2.5	Class 3	Class 3	Class 3	ABS A1
Propulsion Horsepower		5,000	4,000	12,720	8,820
HP/Displacement		2.187	2.257	1.960	1.820
Endurance	90 Days	90Days	60 Days	75 Days	72 Days
Range	15,000 NM	14,000 NM	15,000 NM		12,000 NM
Length/Beam		3.459	3.781	4.662	5.483
Beam/Draft		4.111	3.000	2.752	3.222
Block Coefficient		0.556	0.529	0.623	0.511
Displacement-Length		323	353	297	151
Cubic Number		335	274	815	777
Working Deck Area	1,500 ft2	2,110 ft2	1,322 ft2	3,000 ft2	3,500 ft2
Total Lab Area	2,000 ft2	2,574 ft2	2,900 ft2	4,000 ft2	4,000 ft2
Science Hold	15,000 ft3	20,600 ft3	9,000 ft3	10,000 ft3	15,000 ft3
Van Storage (8x8x20)	2	4	3	4	4
Crew Berths		18	12	30	26
Science Berths	24	24	25	37	36
Total		42	37	67	62

POLAR RESEARCH VESSEL

for

UNIVERSITY OF ALASKA, FAIRBANKS

INTERIM (75%) PROJECT STATUS REPORT

prepared by

THE GLOSTEN ASSOCIATES, INC.
Consulting Engineers Serving the Marine Community
605 First Avenue - 600 Mutual Life Building
Seattle, Washington 98104-2224

File No. 9078
January 1991

POLAR RESEARCH VESSEL

For

UNIVERSITY OF ALASKA, FAIRBANKS

INTERIM (75%) PROJECT STATUS REPORT

A. INTRODUCTION

The following summary of the concept design and the accompanying plan package represent nearly one complete cycle through the design spiral shown in figure 1.

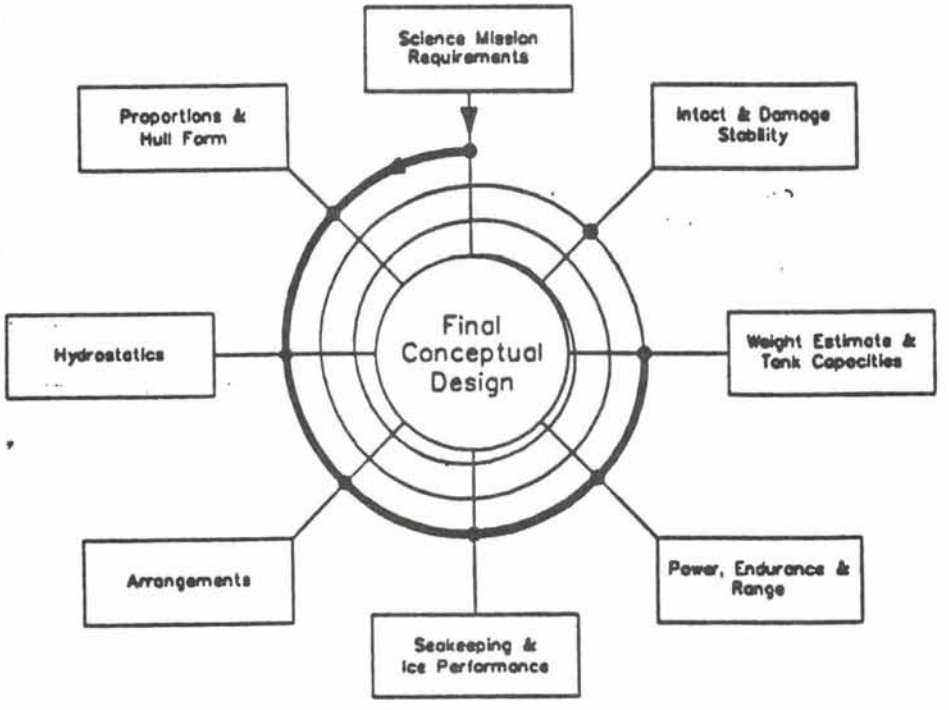


Figure 1.

At this point in the design process it would be beneficial for the Design Committee to review and comment on the concept design as it has evolved to date. The information set out in this report is intended to outline not only the current status of the conceptual design but to also describe, where appropriate, the philosophy behind decisions that have been made to date.

B. PROPORTIONS & HULL FORM

After the kick-off meeting of 22 September it was agreed that the mission profile for the vessel would consist not only of operations in ice and in the marginal ice zone, but the vessel would also spend a great deal of time in open water. It was further agreed that the vessel must possess good sea-keeping characteristics due to unfavorable sea conditions that typify the anticipated operating areas, i.e., Gulf of Alaska and Bering Sea.

After initial consultation with Wartsila Marine regarding the required ice capability, it was decided that a reasonable approach would be to develop the hull form with the primary goal of attaining good sea-keeping characteristics and then to provide the resulting hull with ice strengthening as required.

In order to provide good sea-keeping characteristics a beamy, full waterplane hull form was developed. In particular the vessel will be designed to operate supercritically in roll. This will be achieved by a combination of ample vessel beam and considerable vessel stability. The roll period will thus be small and resonant roll will not occur for two reasons:

- The roll forcing function is small since the beam is relatively large compared to the wave length associated with the small roll period.
- The roll damping is very great, both due to the higher frequency and also due to the hull form.

In addition to the volumetric and endurance requirements of reference 1 we were initially asked to keep the vessel's overall length below 199 ft. (UNOLS Class III). This requirement has subsequently been softened and the design currently has an overall length (LOA) of 208'-6".

Current principal dimensions are as follows:

Length Overall	208'-6"
Length, on Waterline	192'-0"
Beam, Maximum	57'-0"
Beam, on Waterline	55'-6"
Depth, Main Deck	19'-6"
Draft	13'-6"
B/T	4.11
L/B	3.37

The body plan is shown below:

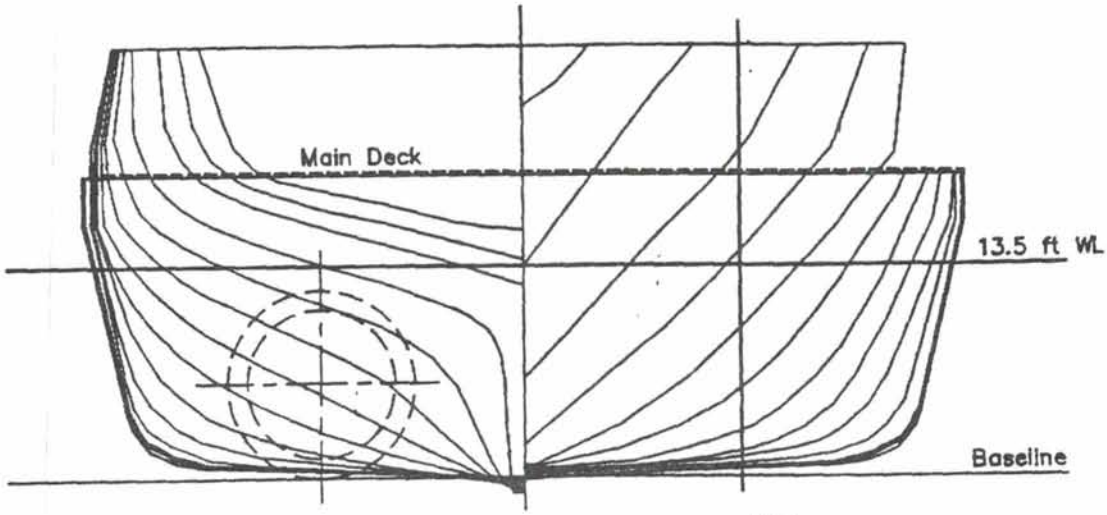


Figure 2.

The volumetric requirements of reference 1 are very nearly satisfied within these hull dimensions as can be seen in the following table:

Item	UNOLS Requirement*	Conceptual Design		Comments
Size	Class III, LOA 199'	LOA =	208'-6"	Approaches UNOLS req for Class III
		LWL =	192'-0"	
		B, max =	57'-0"	
		B, wl =	55'-6"	
		T =	13'-6"	
Consumables	90 Day capability:	F.O.	403 LT	Approx 88% of required capacity
	30 days cruising	F.W.	35 LT	
	30 days station	Freezer	6 LT	
	30 days hotel	Dry store	11 LT	
Accommodations	20-25 Scientists	Scientists	22	2 singles
	20 crew	Crew	20	4 singles
Deck Working Areas	1,500 ft2	Open Dk	2,113 ft2	Total = 2,881 ft2
	8'x80' waist	Encl Dk	490 ft2	
	Foredeck/helo	Sampl'g Dk	278 ft2	

Item	UNOLS Requirement*		Conceptual Design		Comments
Laboratories	Main Lab	1,000 ft2	Main Lab	1,120 ft2	Totals:
	Analy Lab	600 ft2	Analy Lab	627 ft2	Req= 2,600
	Wet Lab	300 ft2	Wet Lab	316 ft2	Avail= 2,829
	Comp Lab	500 ft2	Comp Lab	511 ft2	
	CCC's	100 ft2	CCC's	138 ft2	
	Frzer	100 ft2	Freezer	117 ft2	
Vans	2, 8 x 20 vans 200 ft2 add'l space		4, 8 x 20 vans		Ample deck area
Science Stow.	Total of 15,000 ft3 Half shelving Half open Haz Mat store		Fore Hold 9,600 ft3 Aft Hold 11,000 ft3 20,600 ft3		

* As modified by reference 2

C. HYDROSTATICS

Hull hydrostatics have been received from Wartsila based on the initial hull having a waterline length of 182 ft. The displacement at the 13'-6" waterline is approximately 2200 LT.

Wartsila has since revised the lines to incorporate the changes discussed below in section E (increased length and reduced beam) as well as refining the bow lines for more efficient ice breaking (waterlines will be filled out to produce shallower buttock angles). The current displacement at the 13'-6" waterline is 2286 LT.

D. ARRANGEMENTS

The attached plan package shows the conceptual arrangement of the vessel at this time. In addition to the requirements contained in references 1 and 2 the following goals have driven the arrangement of spaces:

- All laboratories located on the main deck and common to the enclosed sampling area.
- All accommodations at least one deck above the waterline to enhance habitability.
- Low profile superstructure to combat adverse effects of ice accretion as well as to keep accelerations in the accommodation areas at reasonable levels.

E. SEA-KEEPING & ICE PERFORMANCE

The principal dimensions given above, with the exception of length which was originally set at lwl=182' in order to meet the 199' LOA requirement, were transmitted to Wartsila for analysis. Wartsila developed hull geometries fitting these envelope dimensions using derivatives of two ice capable research vessels parent hulls, the ARANDA and the ARNOLD VEIMER.

The results of the original powering analysis is summarized below:

Open water, 12 kts, SS 5 .....1,500 HP
2 ft. level ice, 3 kts ..... 5,000 HP
3 ft. level ice, 3 kts ..... 8,000 HP

After meeting with Wartsila on 19 November to discuss the results of their analysis and how we might reduce the ice breaking power requirements, the following suggestions were made:

- Install a bubbler system
  Wartsila estimates that for every 100 horsepower put into a bubbler system a reduction of 200 horsepower could be realized in the ice breaking power requirement.

- Reduce the vessel beam
  Wartsila suggested reducing the beam by adding flare to the sides, i.e., retain the 57 ft beam at the deck but reduce the beam at the waterline.

- Modify bow lines
  The waterlines should be filled out to produce shallower buttock lines.

These suggestions have been incorporated into the lengthened vessel. The new principal dimensions were submitted to Wartsila for one more cycle of analysis with the following results:

Level Ice Thickness	Without Bubbler	With Bubbler
1.5'	1,600 HP	1,500 HP
2.0'	2,400 HP	2,200 HP
2.5'	3,400 HP	3,100 HP
3.0'	5,100 HP	4,400 HP

The open water sea-keeping characteristics of this vessel should, as we found with our recent Medium Endurance R/V design for Scripps, be an improvement over a conventionally proportioned vessel of the same displacement. In particular, roll and pitch accelerations as well as relative heave motion should be improved.

In an effort to assess improvements in sea-keeping, motions will be analyzed using DTNSRDC's Ship Motion Program (SMP). Additionally, information gained from theoretical predictions and model tests of the Medium Endurance Research vessel provide a good basis for evaluating the sea-keeping characteristics of the Polar R/V.

F. POWER & ENDURANCE

Using the power predictions from Wartsila for open water in SS 5, a preliminary calculation of required fuel capacity was made.

Based on the required 30 days cruising, 30 days station-keeping, and 30 days hotel service a fuel capacity requirement of 460 LT was estimated.

The current design has a fuel capacity of approximately 403 LT. This is approximately 88 percent of the estimated requirement. As the design evolution continues we will be looking to refine our estimate of fuel consumption and perhaps adding fuel carrying capacity to the vessel.

G. WEIGHT ESTIMATE & TANK CAPACITIES

A preliminary weight estimate of 1500-1730 LT was arrived at based on numbers provided by Wartsila. These estimates are derived from a data base which includes 30 light to medium ice breakers built in North America over the last 15 years. Wartsila has informed us that their lightship estimates include permanent scientific outfit. The following breakdown of weights in the full load condition is estimated:

Lightship	1730 LT
Fuel Oil	403 LT
Lube Oil	11 LT
Potable Water	50 LT
Dry Stores	11 LT
Freeze/Chill Stores	6 LT
Sub-Total	2211 LT
Science Cargo	50 LT
Margin	50 LT
Full Load Displacement	2311 LT

The full load displacement corresponds to a waterline of 13.6 feet.

H. INTACT & DAMAGE STABILITY

At this time we are beginning preliminary analysis of intact and damage stability. We anticipate that the overall science mission flexibility of this vessel will be enhanced by its stability characteristics. The large beam, and correspondingly large values of GM (metacentric height), will allow a great deal of latitude in the placement of scientific deadweight.

Damage stability will be based on a one-compartment flooding standard as required by 46 CFR 170.173. Intact and damage stability calculations will include 3" of ice on all exposed decks and superstructure.

Although not strictly required, the vessel will be designed with a double hull in accordance with the Canadian Arctic Shipping Pollution Prevention Regulations (CASPPR).

I. REFERENCES

1. Scientific Mission For An Intermediate Ice-Capable Research Vessel, UNOLS FIC, April 1989.

2. Glosten Project Memorandum, 25 September 1990, Meeting Notes, 18 September 1990

APPENDIX V

NATIONAL SCIENCE FOUNDATION
1800 G STREET, N.W.
WASHINGTON, D.C. 20550

DIVISION OF OCEAN SCIENCES
OCEANOGRAPHIC CENTERS AND FACILITIES SECTION

December 27, 1990

Dr. Thomas Royer
Institute of Marine Science
University of Alaska Fairbanks
Fairbanks, Alaska 99775-1080

Dear Tom:

I just received a copy of the Glosten Project Memorandum with the interim concept design for the Arctic research vessel. I understand this material will be a prime discussion item for the upcoming FIC subcommittee meeting in Seattle. Before getting into specific comments, the following are my views on overall concept design goals (and operational factors).

- Sciences mission requirements must be first priority, i.e.

  - ability to work independently in seasonal ice zones of Arctic.
  - ability to work in central Arctic basin with icebreaker support.
  - general purpose research both water column and seafloor studies.
  - capable for open ocean work in addition to ice covered regions.

- Concept design should be ambitious vs minimal, i.e.

  - science demand for capability increases with time.
  - flexibility to meet unanticipated requirements is a must.
  - multidiciplinary cruise requirements are increasing (eg ARCSS).
  - easier to subtract in later design stages than add.

- Arctic ice-operation logistics should be minimized, i.e.

  - ability to transit Northwest passage in summer to meet western and eastern Arctic requirements as needed.
  - fuel/stores capacity to resupply at major ports yet meet central Arctic basin operational profile.
  - power/size/ hull form to meet ice performance and geographical requirements (basins and shelves).
  - maintenance and crewing requirements should not be excessive.

There are a number of additional comments/goals that probably should be made but I believe the sense of my concerns is clear above. It is unlikely NSF will build more than one Arctic polar research vessel in the near future. Although its mission will focus on the western Arctic, it should be fully capable of eastern Arctic and central Basin work as required (escorts at times). The conceptual design should fully reflect science and operational requirements in planning documents.

With the above as background, and reenforced by the current set of conceptual design drawings, I am convinced the "UNOLS Intermediate Ice-capable research vessel" needs to be at least a Class II vessel approximately sized to the "UNOLS Medium Endurance General Purpose research vessel" design. I expect a 230 to 245 foot vessel is required.

Specific comments on interim design are:

- Fan tail area too small, particularly if vans on board. Unclear how/where vans are placed.
- Starboard work area too short for long piston cores.
- No hanger/garage for towed vehicles, e.g. Deeptow, Seamarc
- Wet lab removed from fan tail access. What about biology net tows? Rationale for lab layout?
- Forward science hold access while at sea appears to be through crew quarters??
- Where are science/ship machine shop spaces?
- Incinerator/refuse storage??
- Electrical shop seems misplaced in galley/mess area.
- Staterooms appear small for two person occupancy. Exception is Chief Scientist/Masters quarters with both office and day room.
- Sight lines from bridge to fan tail. Are all areas visible?
- Ship has a "beamy, full waterplane hull form" for open water sea-keeping. What is trade -off for ice operations? Are power requirements increased significantly because of "beamy hull"? Should one trade length for beam?

I do not expect a written response to my comments above. Use them as needed in proceeding with the conceptual design study.

Sincerely,

Donald F. Heinrichs

Donald F. Heinrichs
Head

cc: G. Brass, UNOLS
M. Langseth, UNOLS FIC
OFS Program Directors

APPENDIX VI

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

RSMAS-MGG, Univ. of Miami
4600 Rickenbacker Cswy.
Miami, FL 33149

30 November 1990

The process for developing efficient, fundable schedules for UNOLS ships in 1991 continues. When 1991 ship operations proposals were received on October 9, 1990, it quickly became apparent that the total funds requested were greater than the funds available. UNOLS asked schedulers at all institutions to provide schedule and cost information for their ships. Summaries of the information received revealed a considerable problem for 1991:

NSF		Navy		Other		Total	
Days	$M	Days	$M	Days	$M	Days	$M
3,274	33.37	733	7.36	839	5.56	4,846	46.29

Although final NSF and ONR budgets were not known through October and early November, agency funding estimates made it clear that NSF's share (and the total) of these operational costs had to be reduced by about $5.5 million. Further, continuing uncertainties on dates of KNORR and MELVILLE availability, coverage of essential WOCE projects and some remaining fleet schedule efficiencies were all issues that had to be addressed.

A UNOLS Schedule Review meeting was called for November 14, 1990 to address important scheduling issues. Garry Brass, UNOLS Chair, Mike Rawson and George Shor, Ship Scheduling Committee Chair & Vice Chair, Keith Kaulum, ONR, Dolly Dieter and Don Heinrichs, NSF, and Bill Barbee, UNOLS, met to review UNOLS ship schedule and aspects of Ship Operations proposals for 1991. The UNOLS group, in concert with agency representatives reached recommendations that would reduce the NSF share and the total for 1991 ship operations costs by about $5.4 million. (NSF representatives were satisfied with such a reduction, provided that agency commitments to WOCE and other Global Change programs were met.)

Cost reductions would be more that half from Class II ships, a still-significant amount from Class III's and lesser amounts from Class IV and smaller ships. Cost reductions and goals for schedule efficiency would be achieved by:

1. Curtailing KNORR's 1991 operations so as to accommodate uncertainties in the ship's operational availability,

2. Deferring MELVILLE operations start-up to 1992 (or very late in 1991),

3. Deferring until 1992 a group of NSF-funded projects in the western Pacific, thus eliminating the 1991 deployment of two ships to the region,

4. Suggesting further consolidation of schedules among small ships in the mid-Atlantic,

5. Throughout the fleet, eliminating operations which had been proposed to support science projects later declined or deferred,

6. The WASHINGTON would support WOCE projects in the Pacific, May-June.

The UNOLS Schedule Review Group had one general recommendation concerning schedules and costs: Each operator should make every effort to assure that his/her ship operations and shore support are as lean and efficient as possible, and that proposals reflect every economy. Given the budgetary realities of 1991, the UNOLS fleet and the supporting agencies cannot afford lavish operations and fat proposals.

Garrett W. Brass
UNOLS Chair

APPENDIX VII

R/V CAPE HATTERAS

DUKE/UNIVERSITY OF NORTH CAROLINA
OCEANOGRAPHIC CONSORTIUM

Duke University Marine Laboratory
Beaufort, North Carolina 28516

Phone (919) 728-2111
Fax (919) 728-2514

10 January 1991

To: Gary Brass, UNOLS Chairman

From: Thomas C. Johnson
Peter R. Butzer
Michael Rawson

Re: Issues from the UNOLS Fleet Improvement Plan Epilogue, to be reviewed for UNOLS consideration and action.

In response to George Keller's request at the UNOLS Council meeting in July 1990, we reviewed the subject issues. A preliminary report was presented to the UNOLS Council in September 1990 and was discussed. Based on those discussions, the report has been revised and is hereby submitted for further discussion and final revision.

The options that are presented in this revised report are controversial and are not particularly supported by any of us. They should be viewed only as options to the current way we do business. We hope that we can discuss these in a positive manner and select those options that we want to develop further into new policy and drop the rest.

1. Designation as a UNOLS Vessel

- The rationale for being designated a UNOLS vessel is quite clear and reasonable, as stated in the UNOLS Charter. Criteria for being admitted to the UNOLS Fleet are reasonably clear as well. The implications of a vessel being admitted to the UNOLS fleet, however, are considerable. No guarantee of support by federal funding agencies is explicitly stated, but it is anticipated by the operator institution. To some extent this is justified, because the operator insititution provides an infrastructure to the national oceanographic program that at times incurs direct expenditures by the operating institution and subsidy by its host state. Employees of the ship operation are justifiably afffected by job security; if it is threatened, their morale and performance can be expected to decline. The following options should be considered:

  - More stringent criteria should be established and applied for admission to the UNOLS fleet that take into account total fleet requirements. Although this incurs the risk of UNOLS being perceived as an exclusive club, it will control the growth of the fleet, making it easier to

justify requests to Congress for fleet enhancement and keeping agency expenses for vessel inspection and management down. The major objection to this option that has been discussed previously is that open membership to UNOLS encourages all potential vessel operators to bring their vessels up to UNOLS standards of safety and capability.

- There could be two or more grades of membership for research vessels in UNOLS that provide explicit expectations for federal support. For example, "A" vessels might be guaranteed reasonably full schedules or fully supported layups, while "B" vessels might be supported to whatever extent is possible by the available funds after the "A" vessels have been accounted for. "A" designation might be determined by such factors as ship ownership (i.e., federal or private), the uniqueness of the vessel's capabilities, its geographic location, its accessibility to host institution support, its record of satisfactory operation based on past cruise reports, etc.

2. Classification of UNOLS Vessels

- The classification of UNOLS vessels based on length has caused some problems, particularly concerning the definition of a "full working year" and the comparison of daily cost of ship time for vessels within a class. This is primarily the result of widely disparate capabilities, berthing space, endurance and time away from home port that vessels within a single class may exhibit. The seasonality of vessel operations in the Great Lakes, Chesapeake Bay and Alaska certainly affect daily ship costs for three vessels in the UNOLS fleet. The following options should be considered:

  - Eliminate the classification system altogether. The main rationale for the system is that it allows for a grouping of vessels in the schedule process where vessels of one class tend to have more schedule mismatches than interclass programs.

  - Classification by operational areas. This wouldn't work too well for a vessel which changes operational areas from year to year.

  - Some variation of science berths/LOA ratio classification similar to Linda Goad's analysis (presented as attachment to this report's predecessor at the September 1990 Council meeting).

  - Classification by daily costs. Where would one make the distinction between one class and the next?

  - Classification based generally on the recent FIC studies

which provide minimum requirements for "medium" and "high" endurance vessels. "Low" endurance vessels would have to be defined by the same criteria.

- Perhaps the classification system should remain as is, and any anomalously classed vessel under the present system should be moved to a more appropriate class.

3. Full Working Year

- A "full working year" for vessels in different classes was defined by the RVOC a couple of years ago. The problem with the definition was that it did not take into account some of the anomalies that may exist within a single class, as described above. Two options to be considered are:

  - The UNOLS Council should consider requesting that the RVOC review their definitions of full working year for the UNOLS fleet and consider refining their definitions based on individual vessels rather than by class.

  - Each operator should generate a curve of daily ship cost versus total number of ship days per year (Fig. 1). These curves generally are exponential, with the added cost per day of ship time decreasing fastest in the first 180 days. A mathematical analysis of the suite of all curves for the fleet should be possible that would determine the optimum number of days that each ship should be at sea. This would not be adhered to rigorously because so many other factors must be considered when constructing the ship schedule. However it might indicate where ship time could be moved between vessels at great overall savings to NSF and ONR without adversely affecting the science requirements.

4. Small UNOLS Vessels

- Finally the Fleet Improvement Plan focused on the large and intermediate ships. Equal focus is now required for the small ships in the UNOLS fleet. As the Plan states, the primary criterion for fleet composition and direction is the science funding. A strong case can be made for the likelihood of a significant increase in funding for coastal oceanography with the current concern about environmental issues and global change. The UNOLS Council should consider the appointment of a committee to address the science mission requirements and future composition of the small research vessels in the UNOLS Fleet.

NATIONAL SCIENCE FOUNDATION
1800 G STREET, N.W.
WASHINGTON, D.C. 20550

DIVISION OF OCEAN SCIENCES

Capt. W.L. Stubblefield
Coordinator
NOAA's Fleet Modernization Plan
Office of Oceanic and Atmospheric Research
Silver Spring, MD 20910

Dear Bill:

The major purpose of the academic research vessels operated by member institutions of UNOLS is to support oceanographic research. The vessels are available to the entire oceanographic community and normally support research activities funded by NSF, ONR, NOAA and other federal and state agencies. Research activities include monitoring e.g. time series work and fisheries oceanography in addition to a wide variety of air-sea, water column and sea floor studies.

All the UNOLS vessels are outfitted with basic capabilities for multidisciplinary studies - ie. laboratory space, instrument handling winches, wires, cranes and A-frames, navigation systems for precise location, various analytical and sampling systems and access to shared-use instrument pools for specialized studies. They are operated by marine departments experienced with changing demands for different types of research. The ship crews and technical staff are experienced and knowledgeable in operations and procedures for research at sea. All the UNOLS ships are included in regular inspection programs for safety, operations, material condition and scientific capability. They also must meet all applicable U.S. Coast Guard and ABS regulations.

In short, the academic research vessels (physical capabilities, crewing, and operations mode) are designed to meet many of NOAA's requirements outlined in your letter. This includes most aspects of fisheries research and resource assessment, multidisciplinary oceanography research (coastal and open ocean), and time-series data collection.

Attached is a list of the UNOLS research ships, Class I through Class IV, expected to be in operation in CY 1992. I have not included detailed specifications on scientific berths, science outfitting or special capabilities. These can be provided if needed. No major changes in fleet composition are expected for CY 1993. NSF expects to support mid-life refits on the three OCEANUS-class ships in 1992 - 94. In addition, Navy plans call for an additional Class I ship (AGOR-24) to be available in 1994. This ship will replace an existing research vessel in the UNOLS fleet.

In 1992, I estimate up to 1300 days of additional support can be provided for NOAA programs by UNOLS ships. Although some trade-offs are possible between ships classes, general projections are:

Class I ships (3)	180 days
Class II ships (5)	390 days
Class III ships (8)	370 days
Class IV ships (7)	360 days
	1300 days

These estimates do not include current use of the ATLANTIS II and EDWIN LINK/SEWARD JOHNSON by NOAA for submersible and ROV support.

For 1993, a similar number of days should be available (1000-1200 days) provided no ships are retired. If additional support by NOAA or other sources does not become available in 1992, it is possible one Class II, one Class III and one Class IV ship will cease operation by 1993. In this case, approximately 500 - 600 days of ship time would be available for NOAA projects.

Projections beyond 1993 depend strongly on future agency budgets but the academic research fleet should be able to continue to provide 500-600 days per year of support for NOAA studies.

Two additional tables list my estimates of the amount of time available for use by NOAA with the academic fleet and approximate costs by ship class. The "daily rate" estimates are based on current costs, including the recent run-up in diesel fuel prices. Major changes in fuel costs, up or down, would affect these estimates. The estimated costs include all elements of ship operations - i.e. Salaries and Wages for ship's crew and marine operations staff, Repair, Maintenance and Overhaul, Other expenses(Fuel and Lube Oil, Food, Insurance, Supplies, Crew Travel, Shore Facility Support and Miscellaneous), and Indirect costs. No additional charges for maintenance of the ships are made. UNOLS institutions do not operate as "bare boat" charterers.

NSF, with some support from ONR, maintains active instrumentation, shipboard scientific support equipment, and technical support programs to enhance the scientific productivity of the research vessels. All UNOLS institutions require some support beyond the ship day rate to maintain, calibrate, repair, schedule and provide expendable supplies for institutional supplied science systems. Some institutions require support be provided for at least one marine technician familiar with the shared-use systems. NOAA - supported projects must provide for their pro-data share of these costs. If NOAA becomes a major user of the UNOLS vessels, NSF will request NOAA participate in the instrumentation and shipboard scientific support equipment programs. The capabilities provided meet the needs/requirements of all users of the ships.

Finally, we (NSF and the academic institutions) do not view NOAA use of the UNOLS ships as "commercial charters" but rather as part of the overall national oceanographic research effort. Although NOAA is delinquent in providing agency support for UNOLS Office operations (i.e. $29,181 for FY 89 and$30,610 for FY 90), NOAA is one of the six federal co-sponsors of UNOLS. A key element of this partnership is timely planning and commitment. Planning for multiyear projects, e.g. time-series data collection or servicing mooring arrays, must have adequate lead time for other projects to fit around the fixed time points. The UNOLS institutions have primary responsibility for their ship schedules. They work through the UNOLS Ship Scheduling Committee, with input from funding agencies, to develop an integrated effective and efficient "national" schedule.

The basic framework for any UNOLS ship schedule begins early in the calendar year preceeding the operating year (i.e. early 1991 for 1992 operations). Schedules at this time include many "to-be-funded" projects along with firm commitments. Schedules become more refined at the summer UNOLS scheduling meeting and address remote location and/or time constraint issues. Final schedules are established in conjunction with the fall UNOLS meeting (with a few loose ends/late projects to be decided). Major requests for specific cruise times/locations late in the process often cannot be met. Early requests, within total available time, almost always are met.

If you have additional questions or need clarification of any points, I will be happy to provide additional information.

Sincerely,

Donald F. Heinrichs

Donald F. Heinrichs
Head

cc: UNOLS Office
G. Brass, UNOLS Chair
S. Ramberg, ONR
OFS Program Directors

UNOLS Research Vessels : 1992

Ship	Region
Class I	
THOMPSON (U. Washington)	Pacific, Global
MELVILLE (Scripps)	Pacific, Global
KNORR (WHOI)	Atlantic, Global
Estimated daily rate: $16,000	Range: $14,500 - $16,500
Potential NOAA use: 180 days	
Class II	
EWING (Lamont)	Global
ATLANTIS II (WHOI)	Alvin operations
WASHINGTON (Scripps)	Pacific, Global
MOANA WAVE (Hawaii)	Pacific
VICKERS (USC)	Pacific
Estimated daily rate: $12,600	Range: $9,800 - $16,000
Potential NOAA use: 390 days	
Class III	
ENDEAVOR (Rhode Island)	N. Atlantic
OCEANUS (WHOI)	N. Atlantic, Caribbean
WECOMA (Oregon State)	N. Pacific
GYRE (Texas A&M)	Caribbean, Eq. Atlantic
ISELIN (Miami)	Atlantic, Caribbean
NEW HORIZON (Scripps)	E. Pacific
EDWIN LINK (Harbor Branch)	ROV Operations
SEWARD JOHNSON (Harbor Branch)	Submersible Operations
Estimated daily rate: $8,800	Range: $8,000 - $9,400
Potential NOAA use: 370 days	
Class IV	
PT. SUR (Moss Landing)	E. Pacific, Coastal
CAPE HATTERAS (Duke)	N. Atlantic, Coastal
CAPE HENLOPEN (Delaware)	Coastal, Chesapeake/ Delaware Bay
WEATHERBIRD II (Bermuda)	Coastal, Bermuda
R. WARFIELD (Maryland)	Chesapeake Bay
R. SPROUL (Scripps)	Coastal, Calif/Mexico
ALPHA HELIX (Alaska)	N. Pacific, Bering Sea, Coastal
Estimated daily rate: $5,600	Range: $4,800 - $7,100
Potential NOAA use: 360 days	

DIVISION OF OCEAN SCIENCES

January 10, 1991

NOTES : 1992 Operations

Class I ships

THOMPSON expected to support Equatorial Pacific JGOFS experiment (Spring and Fall). Potential for logistically compatible NOAA cruises in Equatorial and/or North Pacific regions.
KNORR and MELVILLE expected to support WOCE hydrographic program for significant part of one-ship operating year. Schedule flexibility exists to trade-off between ships. Potential for NOAA cruises in Atlantic (KNORR) or Pacific (MELVILLE).

Comment:

KNORR and MELVILLE in yard undergoing major refit. Expect both to be available for full operating year in 1992. Important that potential NOAA use be identified by June 1991 so that schedule options can be resolved.

Class II ships

EWING starts 1992 operating year in western Pacific with expected (working) return to North Atlantic. Potential for support of NOAA FARA cruises to Mid-Atlantic ridge.
ATLANTIS II will provide normal support for NSF/NOAA/ONR ALVIN programs.
MOANA WAVE, plus WECOMA/WASHINGTON (?), expected to support TOGA/COARE in western Pacific in first quarter. NOAA COARE projects possible on combination of two or three ships. Additional time available later in year on MOANA WAVE and WASHINGTON for other Pacific work. VICKERS expected to have light schedule operating out of U.S. west coast. Potential for significant NOAA use.

Comment:

NSF estimates academic fleet has excess capacity of one ship in this group for Pacific projects based on ONR/NSF research support. If significant NOAA and/or other support not available, NSF will recommend WASHINGTON be considered for retirement.

Class III ships

WECOMA and NEW HORIZON are only Pacific-based ships in their class. As noted above, potential for NOAA use of WECOMA in conjunction with TOGA/COARE. Later in year there are possibilities for eastern Pacific NOAA studies on both ships.

ENDEAVOR, OCEANUS, GYRE and ISELIN all operate in the Caribbean, Gulf of Mexico and equatorial, central and North Atlantic. Potential for up to one full ship year of NOAA projects from this set of ships.

EDWIN LINK and SEWARD JOHNSON have limited science outfitting for general purpose work. They are excellent support ships for HBOI ROV and submersible systems. NOAA is currently largest federal user and can continue in this role.

Comment:

NSF estimates academic fleet has excess capacity of one ship from ENDEAVOR, OCEANUS, GYRE, ISELIN group for Atlantic/Caribbean projects based on ONR/NSF research support. If significant NOAA and/or other support not available, ONR (with NSF concurrence) will recommend GYRE be considered for retirement.

Class IV ships

These ships primarily provide support for regional coastal studies although PT SUR, CAPE HATTERAS and ALPHA HELIX can work in open ocean areas. Potential for NOAA coastal cruises off California (PT SUR), Caribbean to Gulf of Maine (CAPE HATTERAS) and Gulf of Alaska, Bering Sea and western Arctic Ocean (ALPHA HELIX). R. Sproul suitable for coastal work from Mexico to Central California. CAPE HENLOPEN and R. WARFIELD are available for work in Chesapeake and Delaware Bay region. WARFIELD only suited for bay work -- short cruises. HENLOPEN also capable of short duration off-shore coastal work from New Jersey to Carolinas. WEATHERBIRD II is stationed in Bermuda and supports JGOFS time series station. Time available for short cruises in Bermuda region.

Comment:

WARFIELD, CAPE HENLOPEN and CAPE HATTERAS expected to have up to 180 days available for NOAA mid-Atlantic region projects in 1992. ALPHA HELIX also expected to have up to 120 days available for NOAA studies in 1992.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Silver Spring, MD 20910
OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

DEC 1 24 1990

Dr. Donald Heinrichs
Director of Oceanography
National Science Foundation
1800 G. Street, NW, Rm 609
Washington, D.C. 20550

Dear Don:

NOAA is conducting a market survey to determine the capability, availability, and annual charter cost of existing research and survey vessels in the United States. Information regarding the UNOLS fleet would be most valuable to this survey.

The charter vessel missions of interest to NOAA are bathymetric and hydrographic surveys, fisheries research and resource assessment, and multidisciplinary oceanography. These missions are carried out in much of the world's oceans. Of interest to NOAA are vessel capabilities that range from low endurance coastal and estuarine work to high endurance open ocean research. These vessels should be available with mission equipment and U. S. Coast Guard qualified operating crew for short-term charters (less than one year). The operating crew will not be responsible for scientific or survey data collection and analysis.

NOAA's oceanographic mission, for which the UNOLS vessels are best suited, is mostly monitoring. The monitoring involves time-series data collection, which requires a vessel being available at a given position within fairly narrow time windows. An example is the semi-annual servicing of moored arrays near the equator in support of the EPOCS project. The desired servicing is about every 6 months.

It would be most useful if you could provide:

- Potential availability of UNOLS vessels, by ship class, for periods of 100, 101 - 200, 201-500, 501 - 1000, and greater than 1000 Days At Sea (DAS) per year.
- Please approximate cost per day for each of these groupings. The costs should reflect any maintenance charges which NOAA could be expected to assume if we become a major user of the UNOLS vessels.

A reply by January 4, 1991 would be very much appreciated.

Sincerely,

Bill

W. L. Stubblefield
Coordinator,
NOAA's Fleet Modernization Plan

NSF FY 1991 BUDGET APPROPRIATION

NSF

- Total Funds are $2.316 Billion
- Increase of $232 Million or 11.1% from FY 1990
- Increase maintains Administration commitment to doubling the Foundation's budget
- Research and Related Activities increases by $101 M or 6.4%
- Science and Engineering Education increases by $102 M or 46.2%
- U.S. Antarctic Program increases by $23 M or 15.1%

GEOSCIENCES (less Antarctic Program)

- Total Funds are $367.7 Million
- Increase of $42.7 M or 13.1% from FY 1990
- Increases for
  - Global Geosciences
  - New research investigations and instrumentation
  - New program in Arctic social sciences
  - Science and Technology Centers

NSF FY 1991 BUDGET APPROPRIATION

OCEAN SCIENCES

- Total Funds are $164.8 Million
- Increase of $17.4 Million or 11.8% over FY 1990
- Global Geosciences increase by $14.0 M or 64.2%
- Other programs increase by $3.4 M or 2.7%

OCEAN SCIENCES RESEARCH SUPPORT

- Increase of $9.2 Million or 12.5% to $82.1 M
- Focus on Global Change and new investigations
  - implementation of WOCE with hydrographic sections in Pacific, initiation of surface drifter program, and Atlantic process experiments
  - expansion of JGOFS with Pacific equatorial biogeochemical flux program
  - initiation of RIDGE field programs
  - participation of TOGA Coupled Ocean/Atmosphere Response Experiment
  - long lead-time instrumentation and model development for GLOBEC
  - increase number of awards to new and young investigators

NSF FY 1991 BUDGET APPROPRIATION

OCEANOGRAPHIC CENTERS AND FACILITIES

- Increase of $5.3 Million or 12.4% to $47.7 M
- Focus on facilities, field operations and technological requirements of Global Geosciences program
  - ship and technical support for Global Geosciences field programs funded by research programs
  - ocean technology support for ecosystems dynamics sampling systems and operations of accelerator mass spectrometry facility
  - upgrading of scientific support equipment in academic research fleet to meet global change research needs

OCEAN DRILLING PROGRAM

- Increase of $3.0 Million or 9.4% to $35.0 M
- Focus on operational costs, development of crustal drilling technology, and individual investigator support
  - measurement and sampling tools for high-temperature environments
  - experiments to measure crustal deformation and fluid flow in boreholes
  - high latitude field programs to define regional geologic framework for future drilling
  - support for analysis of geochemical and geophysical logging data

NSF OCEAN SCIENCES BUDGET

	1988	1989	1990	1991	Change 88–91
OSRS	67.2	70.9	72.9	82.1	22.2%
OCFS	37.2	43.6	42.5	47.7	28.2%
ODP	30.6	31.4	32.0	35.0	14.4%
	135.0	145.9	147.4	164.8	22.1%

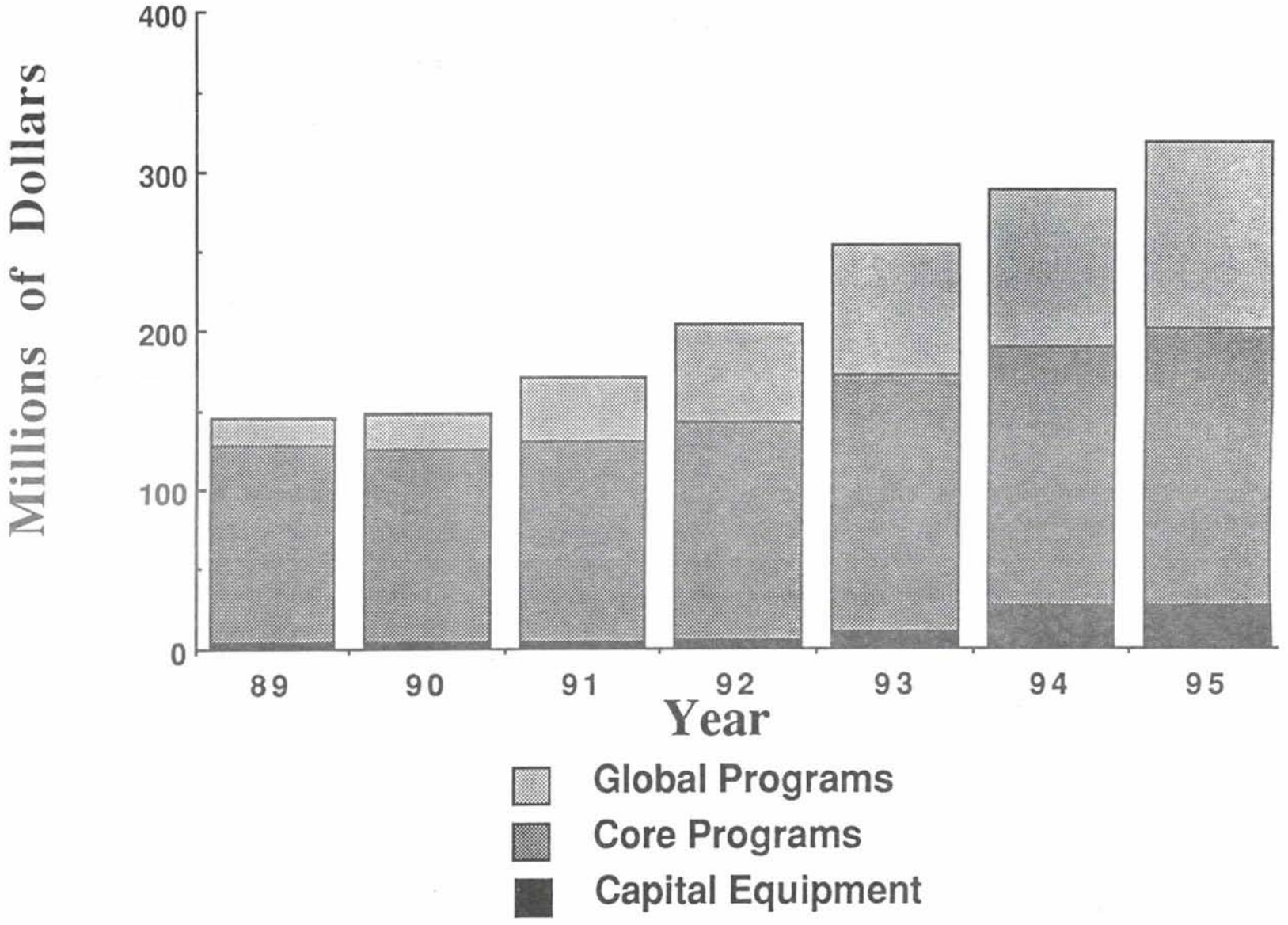
FY 1991 BUDGET INCREMENT

• Global Geosciences	$14.0 M
• Disciplinary Base	$0.4 M
• Ocean Drilling Program	$3.0 M
	$17.4 M

FY 1991 BUDGET PROFILE

Science	$99.7 M
• Disciplinary Science	75.7
• Global Geosciences	24.0
• Education and Human Resources	(3.1)
Facilities	$65.1 M
• Disciplinary Science	53.5
• Global Geosciences	11.6
• Capital Equipment	(2.6)

OCE Long-Range Plans (1989-95)



OCEAN SCIENCES DIVISION DETAIL

	Actual FY 1989	Actual FY 1990	Estimates FY 1991
Ocean Sciences Division	$ 145.9 M	$ 147.4 M	$164.8 M
Oceans Sciences Research	70.9 M	72.9 M	82.1 M
Ocean Drilling Program	31.4 M	32.0 M	35.0 M
Oceanographic Facilities	43.6 M	42.5 M	47.7 M

OCEANOGRAPHIC FACILITIES DETAIL

Operations			
Ship Operations	24.6 M*	22.4 M*	27.4 M*
ALVIN, Aircraft, etc.	1.3 M	1.4 M	1.4 M
Marine Techs	3.4 M	3.7 M	4.2 M
	29.3 M	27.5 M	33.0 M
Infrastructure			
Science Instruments	1.6 M	1.8 M	4.0 M
Shipboard Equipment	0.9 M	2.1 M	
Ships, Upgrades	2.8 M	3.4 M	2.6 M
UNOLS, Misc.	0.7 M	0.6 M	0.5 M
	6.0 M	7.9 M	7.1 M
Technology, Centers, Reserves			
Technology Development	4.5 M	3.5 M	4.2 M
AMS Center	1.8 M	1.8 M	1.8 M
Cross Directorate/Reserves	2.0 M	1.8 M	1.6 M
	8.3 M	7.1 M	7.6 M

** Plus $1.5 M from ODP (1989), $1.0 M (1990), $1.7 M (1991)*

ACADEMIC FLEET PLANNING: 1991 STATUS

1990 Activities	Sponsor
• EWING begins operation (replaces CONRAD)	NSF
• KNORR and MELVILLE stretch and modernization underway	Navy
• THOMPSON under construction (replaces old THOMPSON)	Navy
• VICKERS conversion to R/V (replaces VELERO IV)	USC
• WEATHERBIRD II begins operation (replaces WEATHERBIRD I)	BBS
• EDWIN LINK and SEWARD JOHNSON designated UNOLS ships	HBOI
• Planning study for midlife refits of OCEANUS-class ships (ENDEAVOR, WECOMA, OCEANUS)	NSF
• Conceptual design study for Arctic ice-capable ship	NSF
• Updated UNOLS Fleet Improvement Plan completed	NSF/ONR

ACADEMIC FLEET PLANNING: 1991 STATUS

UNOLS FLEET IMPROVEMENT PLAN (1990)

- Six high or medium endurance, general-purpose large vessels; one or more capable of supporting a deep-diving submersible
- Ice-worthy research vessel capability for both polar regions
- Six intermediate general-purpose vessels with improved capability
- No recommendation on required number of small UNOLS ships

	Existing	Recommended
Large ships		
High-endurance	3	3
Medium-endurance	1	2
General purpose	3	0
Submersible handling	1	1
	8	6
Intermediate		
General purpose	6	6
Ice-capable	0	1
	6	7
Small		
General purpose	9	?

ACADEMIC FLEET PLANNING: 1991 STATUS

COMMENTS/ISSUES RE UNOLS PLAN

Large Ships

- Identified needs for high- and medium endurance ships to be met by 1994; assumes construction of NAVY AGOR-24 (KNORR, MELVILLE, THOMPSON, EWING, AGOR-24)
- Submersible handling ship at present is ATLANTIS II; 27 years old, marginal for science demands
- NSF long range plans show 1997 replacement; unfunded at present
- Navy plans identify AGOR-25 for 1996 delivery; replacement for ATLANTIS II ??
- UNOLS Plan has "general purpose" ships replaced/phased out; three ships with one replacement (VICKERS, WASHINGTON, MOANA WAVE ?)
- Operating institutions for AGOR-24 and AGOR-25 not required to be current large ship operator
- Impacts ??

ACADEMIC FLEET PLANNING: 1991 STATUS

COMMENTS/ISSUES RE UNOLS PLAN

Intermediate Ships

- Maintain existing ships with refits to increase capabilities in early 1990s (GYRE, OCEANUS, ENDEAVOR, WECOMA); but scientific demand declining in 1980s
- MOANA WAVE and VICKERS are closer in capability and operating mode to intermediates than new large ships; eight ships versus six ships?
- UNOLS Plan implies reduction of group by two ships; excess capacity now; future trends??
- Geographical distribution -- three Pacific, three Atlantic? Institutional versus regional requirements?
- Intermediate ships mainly of same age; block obsolescence in 2000-2010 time frame
- Next generation ship? SWATH?

ACADEMIC FLEET PLANNING: 1991 STATUS

COMMENTS/ISSUES RE UNOLS PLAN

Small Ships

- No UNOLS recommendations; many have non-traditional sources of support. True? False?
- Local versus regional operations. Coastal research directions -- larger ships?
- Next generation ship?

Ice-capable Ships

- NATHANIAL PALMER under long-term charter for Antarctic operations
- UNOLS Plan calls for intermediate size ship. Is this sufficient capability to meet western Arctic, central Basin and eastern Arctic requirements?
- Identified as highest (time) priority in NSF capital construction plan. An Arctic nation without an Arctic ship!

ACADEMIC FLEET PLANNING: 1991 STATUS

Planning Issues

- Planning for 1990s based on financial models with stable, modest growth for disciplinary base programs of NSF and ONR coupled to major increases in global change research. Valid model?

- NOAA role minimal in past with most projects using NOAA fleet ships. Increased NOAA use of academic ships? Increased academic use of NOAA ships?

- Submersible science report by UNOLS (1990) recommends major restructuring/expansion of facilities support. Changing role of ships versus submersible systems? Costs. National versus international.

United States Department of State

Bureau of Oceans and International
Environmental and Scientific Affairs

Washington, D.C. 20520

December 11, 1990

NOTICE TO RESEARCH VESSEL OPERATORS

SUBJECT: Late Research Vessel Clearance Requests

Owing to the large number of late requests being received by OES/OA, a new policy has been implemented. I apologize for being late in issuing this explanation, however, I have been very busy dealing with a high volume of clearance requests.

Because about 60-70 percent of recent clearance requests were being received late, I appealed to the UNOLS Council for advice. They advised that it was my responsibility to remedy the situation and that it was perhaps my leniency that led to the problem. I believe the Council is correct in this assessment and I must now take a "hard-nosed" approach to the timeliness and completeness of requests submitted for research vessel clearances. UNOLS and the funding agencies have promised support to any reasonable approach employed.

Those of you in receipt of my new form are aware of the rather harsh approach being employed. A sample copy of the form is attached. This procedure is being implemented for the long term benefit of all UNOLS and NOAA research cruises requiring foreign clearance. Several coastal states have complained either recently or in the past regarding late requests (Mexico, Brazil, Spain, France, Bahamas). It is my responsibility to assure that a problem request does not jeopardize future access to a coastal state. In addition, I am constantly in a crisis mode trying to implement late requests, often to the detriment of those few who submit timely requests. It is not fair for those requests to be held up for late ones. This situation can no longer be tolerated. Also attached is the record of clearance requests since October 1989.

This office is in the process (finally) of implementing a computerized clearance monitoring system, and for this system to be effective, our procedures must become very bureaucratic. Each request received must be timely and complete to be handled in a routine manner. It may become necessary to return those not in compliance with established procedures. Please refer to the UNOLS "Handbook for International Operations of U.S. Scientific Research Vessels" for instructions regarding compliance with procedures.

Although it is not my intention to have anyone lose a clearance, if the frequency of late requests continues, there will be no recourse but to insist on timely requests which may necessitate rescheduling research to accommodate coastal state, and Dept. of State, requirements.

Please refer to the latest revision of NTRVO No. 68 for coastal state lead time requirements. Naturally we will continue to process those late requests for which there is justifiable cause for untimely submission. However, this justification must accompany the request.

It is advised that projects approaching clearance prior notice deadlines which have not yet been funded, be submitted for foreign clearance; the situation being easier to cancel a non-funded project than to implement a late request.

It is my sincere hope that 1991 will see a much more responsible approach by all ship operators to research vessel clearance requests.

W. Thomas Cocke
R/V Clearance Officer
Office of Ocean Affairs

United States Department of State

Bureau of Oceans and International
Environmental and Scientific Affairs

Washington, D.C. 20520

MEMORANDUM

TO: _____
_____
_____
_____

FROM: W. Thomas Cocke
Research Vessel Clearance Officer
Office of Ocean Affairs

SUBJECT: Acknowledgement of receipt of clearance request for _____ during _____

REFERENCE: UNOLS Handbook for International Operations of U.S. Scientific Research Vessels

1. OES/OA has received your letter dated _____ requesting clearance for marine research by R/V _____ (Dr. _____) during the period _____.

2. The request material has been reviewed for completeness and compliance with Department of State guidelines and foreign requirements and the following determinations have been made:

A._____ The information was determined to meet all requirements for completeness and timing. We are transmitting this request to our Embassies in the following coastal states: _____.

B._____ The information listed below was not included, however, we are transmitting this request to our Embassies in the following coastal states: _____.

We are processing your request as indicated above, however, the following information must be provided ASAP:

_____ Adequate track chart.

_____ Adequate information regarding foreign observer/participant as outlined NTRVO # 85.

_____ Curriculum Vitae for chief scientists.

_____ _____.

C._____ The leadtime requirement for _____ was not met as outlined in NTRVO # 68 revision 4. Your institution's recent record of timeliness for submitting clearance requests follows:

_____. The consequence of submitting requests late to various coastal states is that they may not consider the request, or even if they do, there is the expectation that their response may be delayed. We are requesting our Embassies in the following coastal states to implement this request, if in their opinion it will not jeopardize any pending clearances, and if the coastal state will accept it: _____.

D._____ Your late request is being returned owing to an inacceptable record of submissions. Your priviledge of obtaining clearances through this office may be cancelled altogether if your record is not improved upon in the future. You may want to reschedule the dates of the proposed research in order to meet the leadtime requirement of ___ months for _____.

E._____ Your late request is being returned owing to problems with _____ which leads us to believe that this request may jeopardize others pending there. You may want to reschedule the dates of the proposed research in order to meet the leadtime requirement of ___ months for _____.

F._____ We are holding your request pending submission of the following:

_____ Adequate justification for late submission to: _____. ___ months notice required as outlined in NTRVO # 68 revision 4.

_____ Adequate description of research project.

_____ Special documentation required by _____ as outlined in NTRVO # __.

_____ Sufficient information to determine the coastal states in which the research is proposed.

_____ Adequate track chart.

_____ Adequate information regarding foreign observer/participant as outlined NTRVO # 85.

_____ _____.

3. We have assigned the cruise the following number: _____. Please use this number in all future references to this cruise, including any additional information requested above.

4. You are expected to keep this office apprised of any and all changes to your research or ship schedule.

5. You may be expected to meet certain conditions required by the coastal state in return for their approval for your research in their waters. These conditions may be in addition to the standard requirements for the sharing of all data analyses and reports, and providing shipboard space for the participation of coastal state scientists, if required. This office will advise you as to the U.S. policies that may be involved or the impact of any conditions on customary international practice.

6. You will be expected to submit a preliminary cruise report within 30 days after completion of the cruise. The chief scientist is required to provide a schedule (month/year) for providing each data package, data analysis or report. Obligations already met, such as taking aboard participants, should be noted in the preliminary cruise report. All other obligations should be met according to the schedule outlined in the preliminary cruise report. Copies of all data results and reports should normally be sent to this office for forwarding to the U. S. Embassy for transmittal to the Foreign Ministry of the coastal state. The State Dept. will rely on the chief scientist to implement these requirements.

cc: UNOLS
NSF/ONR/NOAA

CY 89 Clearance Requests

Cruise No.	Ship	Coastal State	Inclusive Dates	Date Rec	Date Req
89-088	JORDAN/MCARTHUR	Mexico	07/28/90 - 12/06/90	10/06/89	12/28/89
89-089	SURVEYOR	Peru	11/27/89 - 04/15/90	10/10/89	04/27/89
89-090	COLUMBUS ISELIN	Brazil	04/22/90 - 07/01/90	10/24/89	09/22/89
89-091	OCEANUS	Bermuda	11/30/89 - 12/13/89	11/02/89	09/30/89
89-092	CORWITH CRAMER	Bermuda	05/23/90 - 07/03/90	11/03/89	03/23/90
89-093	ATLANTIS II	Mexico	06/08/90 - 06/23/90	11/06/89	11/08/89
89-094	ATLANTIS II	Mexico	05/26/90 - 06/03/90	11/06/89	10/26/89
89-095	MOANA WAVE	Philippines	04/27/90 - 05/28/90	11/07/89	01/27/90
89-096	CORWITH CRAMER	Bahamas	01/22/90 - 02/05/90	11/15/89	10/22/89
89-097	WESTWARD	Bahamas	01/11/90 - 02/09/90	11/15/89	10/11/89
89-098	WESTWARD	Bahamas	03/04/90 - 03/10/90	11/15/89	12/04/89
89-099	MOANA WAVE	Philippines	05/27/90 - 06/10/90	11/15/89	02/27/90
89-100	ENDEAVOR	Canada	01/03/90 - 01/13/90	11/17/89	11/03/89
89-101	DELAWARE II	Canada	01/29/90 - 02/09/90	11/21/89	11/29/89
89-102	SEAWARD EXPLORER	Cuba	04/30/90 - 06/30/91	11/16/89	01/30/90
89-103	SELSKIY	Mexico	01/10/90 - 05/21/90	11/24/89	06/10/89
89-104	MALCOLM BALDRIGE	France	02/22/90 - 04/16/90	11/28/89	10/22/89
89-105	THOMAS WASHINGTON	Mexico	06/30/90 - 07/15/90	11/29/89	11/30/89
89-106	THOMAS WASHINGTON	Mexico	07/11/90 - 07/30/90	11/29/89	12/11/89
89-107	DELAWARE II	Canada	02/20/90 - 03/02/90	12/13/89	12/20/89
89-108	SEDCO/BP 471	Micronesia	01/24/90 - 03/27/90	12/18/89	10/24/89
89-109	ENDEAVOR	Bahamas	06/01/90 - 06/18/90	12/22/89	03/01/90
89-110	YELLOWFIN	Mexico	06/04/90 - 07/03/90	12/29/89	11/04/89

CY 90 Clearance Requests

Cruise No.	Ship	Coastal State	Inclusive Dates	Date Rec	Date Req
90-001	SEA DIVER	Spain	07/15/90 - 11/01/90	01/02/90	12/15/89
90-002	DE STEIGUER	Mexico	07/12/90 - 08/13/90	01/05/90	12/12/89
90-003	NOAA Aircraft	Mexico	07/01/90 - 08/15/90	01/05/90	12/01/89
90-004	DELAWARE II	Canada	03/05/90 - 04/21/90	01/12/90	01/05/90
90-005	EDWIN LINK	Mexico	08/15/90 - 09/05/90	02/01/90	01/15/90
90-006	DON JOSE	Mexico	06/15/90 - 07/04/90	02/02/90	11/15/89
90-007	MCARTHUR	Canada	04/02/90 - 04/27/90	02/20/90	02/02/90
90-008	NEW HORIZON	Canada	05/25/90 - 06/14/90	02/20/90	03/25/90
90-009	THOMAS WASHINGTON	Venezuela	06/03/90 - 06/24/90	02/20/90	01/24/90
90-010	DON JOSE	Mexico	10/07/90 - 10/14/90	02/20/90	03/07/90
90-011	CORWITH CRAMER	Canada	07/14/90 - 08/24/90	02/21/90	05/14/90
90-012	OCEANUS	Bermuda	04/16/90 - 05/03/90	02/22/90	02/16/90
90-013	ATLANTIS II	Port call	05/19/90 - 05/22/90	02/22/90	03/19/90
90-014	WESTWARD	Bahamas	03/04/90 - 03/10/90	02/22/90	12/04/89
90-015	CAPE HATTERAS	Canada	04/04/90 - 04/15/90	02/26/90	02/04/90
90-016	MALCOLM BALDRIGE	Costa Rica	04/20/90 - 05/30/90	02/28/90	01/20/90
90-017	WESTWARD	Canada	06/30/90 - 08/10/90	03/02/90	04/30/90
90-018	CORWITH CRAMER	Portugal	10/09/90 - 11/19/90	03/02/90	03/09/90
90-019	QUALIFIER 105	Mexico	10/29/90 - 11/09/90	03/02/90	03/29/90
90-020	MALCOLM BALDRIGE	Brazil	09/11/90 - 10/10/90	03/05/90	02/11/90
90-021	SURVEYOR	Soviet Union	10/01/90 - 11/01/90	03/13/90	03/01/90
90-022	DELAWARE II	Canada	04/23/90 - 05/04/90	03/16/90	02/23/90
90-023	DELAWARE II	Canada	05/07/90 - 05/18/90	03/16/90	03/07/90
90-024	MALCOLM BALDRIGE	Bahamas	06/12/90 - 07/11/90	03/19/90	03/12/90
90-025	OCEANUS	Canada	03/20/90 - 04/11/90	03/20/90	01/20/90
90-026	MAKO	Mexico	09/11/90 - 10/01/90	03/20/90	02/11/90
90-027	MAURICE EWING	Brazil	11/03/90 - 11/30/90	03/23/90	04/03/90
90-028	CAPE HATTERAS	U.K.	06/13/90 - 06/23/90	03/26/90	02/13/90
90-029	MAURICE EWING	Iceland	07/01/90 - 07/19/90	03/28/90	12/01/89
90-030	MAURICE EWING	Iceland	09/27/90 - 10/20/90	03/29/90	02/27/90
90-031	THOMAS WASHINGTON	Mexico	10/05/90 - 10/09/90	03/30/90	03/05/90
90-032	THOMAS WASHINGTON	Mexico	10/31/90 - 12/04/90	03/30/90	03/31/90
90-033	MAURICE EWING	Iceland	07/21/90 - 09/23/90	04/02/90	12/21/89
90-034	Collection Permit	Mexico	02/01/91 - 03/15/91	03/30/90	07/01/90
90-035	WESTWARD	Portugal	10/11/90 - 11/21/90	04/04/90	03/11/90
90-036	SEDCO/BP 471	Australia	08/10/90 - 10/11/90	04/05/90	01/10/90
90-037	NEW HORIZON	Mexico	09/28/90 - 10/19/90	04/06/90	02/28/90
90-038	POLAR DUKE	Chile	06/16/90 - 08/29/90	04/09/90	11/16/89
90-039	OSPREY	Bahamas	06/18/90 - 08/10/90	04/10/90	03/18/90
90-040	CAPE HATTERAS	Canada	07/06/90 - 07/13/90	04/10/90	05/06/90
90-041	ATLANTIS II	Canada	07/19/90 - 08/08/90	04/17/90	05/19/90
90-042	LANEY CHOUEST	Mexico	10/29/90 - 11/30/90	04/17/90	03/29/90
90-043	CAPTAIN'S LADY	Bahamas	08/15/90 - 09/15/90	04/18/90	05/15/90
90-044	CLIFFORD BARNES	Canada	07/30/90 - 08/04/90	04/19/90	05/30/90
90-045	CHAPMAN	Canada	08/05/90 - 08/18/90	04/23/90	06/05/90
90-046	CAPE HATTERAS	Bahamas	08/30/90 - 09/06/90	04/26/90	05/30/90
90-047	NOAA Aircraft	Mexico	08/01/90 - 10/31/90	04/30/90	01/01/90
90-048	DISCOVERER	Canada	07/25/90 - 08/07/90	05/09/90	05/25/90

CY 90 Clearance Requests

Cruise No.	Ship	Coastal State	Inclusive Dates	Date Rec	Date Req
90-049	SEDCO/BP 471	Japan	06/07/90 - 08/05/90	05/11/90	03/07/90
90-050	OCP SEACON	Bermuda	06/30/90 - 07/14/90	05/16/90	04/30/90
90-051	WESTWARD	Canada	08/14/90 - 08/27/90	05/17/90	06/14/90
90-052	BARTLETT	Norway	09/06/90 - 09/28/90	05/22/90	06/06/90
90-053	GYRE	Ecuador	11/04/90 - 11/19/90	05/24/90	06/04/90
90-054	MOANA WAVE	Micronesia	07/08/90 - 07/24/90	05/24/90	04/08/90
90-055	MOANA WAVE	Micronesia	06/23/90 - 07/05/90	05/25/90	03/23/90
90-056	CAPE HATTERAS	Canada	07/23/90 - 08/12/90	05/29/90	05/23/90
90-057	COLUMBUS ISELIN	France	10/21/90 - 11/18/90	06/01/90	05/21/90
90-058	CORWITH CRAMER	Spain	11/27/90 - 01/07/91	06/05/90	04/27/90
90-059	WESTWARD	Spain	11/28/90 - 01/08/91	06/05/90	04/28/90
90-060	EDISON CHOUEST	Mexico	04/03/91 - 06/15/91	06/06/90	09/03/90
90-061	OREGON II	Canada	07/26/90 - 08/21/90	06/07/90	05/26/90
90-062	NEREID	Canada	07/29/90 - 10/22/90	06/11/90	05/29/90
90-063	SIRIUS	Canada	08/01/90 - 09/30/90	06/11/90	06/01/90
90-064	HERNAN CORTEZ	Bahamas	07/09/90 - 07/21/90	06/13/90	04/09/90
90-065	THOMAS WASHINGTON	Canada	08/24/90 - 09/13/90	06/14/90	06/24/90
90-066	MALCOLM BALDRIGE	Trinidad-Tob.	01/03/91 - 02/01/91	06/29/90	06/03/90
90-067	DELAWARE II	Canada	09/10/90 - 10/26/90	06/27/90	07/10/90
90-068	PAT SAN MARIE	Canada	09/01/90 - 09/21/90	06/22/90	07/01/90
90-069	GYRE	Mexico	10/01/90 - 10/09/90	07/02/90	03/01/90
90-070	OREGON II	Mexico	01/09/91 - 02/20/91	06/26/90	06/09/90
90-071	MARSYS RESOLUTE	Bahamas	07/01/90 - 05/31/91	06/27/90	04/01/90
90-072	ABLE J	Canada	08/13/90 - 08/30/90	07/11/90	06/13/90
90-073	SEWARD JOHNSON	Canada	08/12/90 - 09/05/90	07/11/90	06/12/90
90-074	ISLAND QUEEN	Canada	09/07/90 - 10/15/90	07/12/90	07/07/90
90-075	SEDCO/BP 471	Vanuatu	10/16/90 - 12/07/90	07/17/90	07/16/90
90-076	FARNELLA	Micronesia	10/15/90 - 11/08/90	07/16/90	07/15/90
90-077	DAVIDSON	Nauru	08/16/90 - 09/27/90	07/23/90	05/16/90
90-078	DISCOVERER	France	10/12/90 - 12/14/90	07/30/90	05/12/90
90-079	Collection permit	Mexico	03/20/91 - 06/30/91	07/30/90	08/20/90
90-080	ROBERT G. SPROUL	Mexico	03/08/91 - 03/27/91	07/31/90	08/08/90
90-081	MAURICE EWING	Denmark	09/28/90 - 10/26/90	07/31/90	02/28/90
90-082	ATLANTIS II	Mexico	02/28/91 - 03/17/91	08/08/90	07/28/90
90-083	NOAA Aircraft	Mexico	11/01/90 - 02/28/91	08/13/90	04/01/90
90-084	GECO TAU	Italy	09/15/90 - 01/01/91	08/09/90	02/15/90
90-085	SURVEYOR	Chile	12/09/90 - 04/13/91	08/14/90	05/09/90
90-086	MAURICE EWING	Port call	12/14/90 - 12/16/90	08/15/90	09/14/90
90-087	CORWITH CRAMER	U.K.	01/13/91 - 02/08/91	08/14/90	09/13/90
90-088	WESTWARD	France	01/14/91 - 02/03/91	08/14/90	08/14/90
90-089	DELAWARE II	Canada	10/29/90 - 11/09/90	08/24/90	08/29/90
90-090	DELAWARE II	Canada	11/28/90 - 12/13/90	08/24/90	09/28/90
90-091	GYRE	Bahamas	10/19/90 - 10/26/90	09/05/90	07/19/90
90-092	SEWARD JOHNSON	Spain	04/04/91 - 04/28/91	09/06/90	09/04/90
90-093	CORWITH CRAMER	Colombia	02/14/91 - 03/27/91	09/10/90	07/14/90
90-094	WESTWARD	Colombia	02/12/91 - 03/25/91	09/10/90	07/12/90
90-095	CHAUVENET	Morocco	09/22/90 - 03/31/91	09/17/90	02/22/90
90-096	Collection permit	Mexico	01/01/91 -	09/14/90	06/01/90

CY 90 Clearance Requests

Cruise No.	Ship	Coastal State	Inclusive Dates	Date Rec	Date Req
90-097	DELAWARE II	Canada	01/03/91 - 01/18/91	09/25/90	11/03/90
90-098	DELAWARE II	Canada	02/06/91 - 02/21/91	09/25/90	12/06/90
90-099	SEDCO/BP 471	Fiji	12/21/90 - 02/18/91	09/26/90	05/21/90
90-100	MAURICE EWING	France	04/28/91 - 06/01/91	10/11/90	11/28/90
90-101	Collection permit	Mexico	01/01/91 - 12/30/91	10/15/90	06/01/90
90-102	COLUMBUS ISELIN	France	01/28/91 - 02/17/91	10/17/90	08/28/90
90-103	OCEANUS	Bermuda	11/02/90 - 11/26/90	10/18/90	09/02/90
90-104	CORWITH CRAMER	U.K.	04/16/91 - 05/27/91	10/18/90	12/16/90
90-105	WESTWARD	U.K.	04/17/91 - 05/28/91	10/18/90	12/17/90
90-106	MOANA WAVE	P.New Guinea	04/10/91 - 05/19/91	10/24/90	01/10/91
90-107	ENDEAVOR	Denmark	03/23/91 - 04/24/91	10/26/90	12/23/90
90-108	COLUMBUS ISELIN	U.K.	01/08/91 - 01/26/91	10/29/90	09/08/90
90-109	OCEANUS	Spain	04/26/91 - 07/23/91	10/29/90	09/26/90
90-110	POLAR DUKE	Argentina	06/18/91 - 07/31/91	10/30/90	11/18/90
90-111	COLUMBUS ISELIN	France	04/11/91 - 05/13/91	10/30/90	11/11/90
90-112	SEDCO/BP 471	Ecuador	05/05/91 - 07/09/91	11/05/90	12/05/90
90-113	MOANA WAVE	France	02/26/91 - 03/29/91	11/07/90	09/26/90
90-114	CHAUVENET	U.A.E.	11/20/90 - 12/31/91	11/13/90	08/20/90
90-115	OCEANUS	U.K.	03/02/91 - 03/26/91	11/13/90	11/02/90
90-116	SEWARD JOHNSON	Spain	05/24/91 - 06/18/91	11/16/90	10/24/90
90-117	ABEL J	Argentina	01/08/91 - 01/27/91	11/15/90	06/08/90
90-118	MAURICE EWING	France	09/09/91 - 10/09/91	11/20/90	04/09/91
90-119	SEWARD JOHNSON	Spain	05/14/91 - 05/19/91	11/21/90	10/14/90
90-120	SEWARD JOHNSON	France	04/29/91 - 05/11/91	11/21/90	11/29/90
90-121	COLUMBUS ISELIN	Honduras	06/07/91 - 06/27/91	12/05/90	02/07/91
90-122	MALCOLM BALDRIGE	Brazil	06/12/91 - 07/04/91	12/07/90	11/12/90

Requests by Institution/Agency

Inst/Agency	No. Received On Time (%)	No. Received Late to DOS	No. Received late to Coastal State	Total
Univ. Wash.	1 (100)	0	0	1
Scripps	6 (75)	1	1	8
URI	2 (67)	1	0	3
Sea Ed. Assoc.	10 (56)	2	6	18
Univ. Hawaii	3 (50)	0	3	6
NSF Polar	1 (50)	0	1	2
Lamont-Doherty	4 (50)	1	3	8
Duke Marine Lab	2 (40)	2	1	5
NOAA	11 (34)	12	9	32
Univ. Miami	2 (33)	2	2	6
TAMU	1 (33)	0	2	3
Others	7 (29)	7	10	24
Woods Hole	3 (27)	4	4	11
U.S. Navy	1 (20)	2	2	5
Ocean Drill. Prog.	1 (17)	1	4	6
Harbor Branch	1 (14)	5	1	7
Total	56 (39)	40	49	145