UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

SUMMARY REPORT OF THE OCTOBER 26, 1984

UNOLS SEMIANNUAL MEETING

WASHINGTON CONFERENCE CENTER
777 14th Street N.W.
Washington, D.C.

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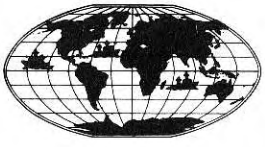
October 1984



Summary Report of UNOLS Semiannual Meeting

October 26, 1984

Washington Conference Center
777 14th Street NW
Washington, D.C.

General: Issues and items considered at the October, 1984 Semiannual Meeting are reported in the order that they were addressed. Unless otherwise noted, all items are from the published agenda (Appendix I).

A list of registered attendees (Appendix II) has been compiled from registration forms available before and during the meeting. A UNOLS Directory (Appendix III) was distributed during the meeting.

Introduction and Welcome: The meeting was called to order by UNOLS Chairman, Dr. Ferris Webster. After welcoming the UNOLS membership, speakers, guests, agency representatives and others from the oceanographic community, Dr. Webster introduced the first of the meeting's two principal speakers, Mr. Robert S. Winokur.

Mr. Robert S. Winokur, Associate Technical Director for Ocean Sciences, Office of Naval Research reviewed the *Initiatives in Oceanography* recently introduced by the Secretary of Navy. *Before beginning the discussion he thanked UNOLS for the assistance provided to ONR through the Fleet Replacement Committee in developing tentative operational requirements to be used in the construction of an oceanographic research vessel, and in developing characteristics for several research vessel types for use in planning an expanded program of research ship construction; and through the ALVIN Review Committee in developing a program for enhanced research use of Navy-operated submersibles (NR-1, SEA CLIFF, TURTLE and others).*

Review of the Secretary of the Navy's initiatives in Oceanography is still in progress, and plans for their implementation are still being developed. It is, nevertheless, of interest to examine the fifteen initiatives, emphasizing those most likely to affect UNOLS institutions together with ONR's role in planning and carrying out the Secretary's oceanographic policy. Four years ago ONR gained responsibility for management of the seven Navy-owned ships that are a part of the UNOLS fleet. Their management plan included a program implemented in FY 1981 to upgrade those ships (and the UNOLS fleet). The five year, $11 M program included:

INSURV Inspections, now in force for all of the Navy-owned ships,

midlife refits to the CONRAD, WASHINGTON and THOMPSON,

stretch and refit to the MOANA WAVE,

correction of material deficiencies to the MELVILLE,

modification and conversion of the ATLANTIS II to support the ALVIN, and

upgrading oceanographic equipment including CTD and oceanographic winches.

(Many of these projects are shared with other agencies, especially NSF/OFS.)

These Navy-owned ships, and the UNOLS fleet, are considered important assets to the Navy, ONR and the nation.

In the Secretary of the Navy's policy statement of July 17, he called for a major reinvigoration of Navy efforts in oceanography. Much publicity has been given his fifteen initiatives for immediate action. A series of slides (Appendix III) summarize the set of initiatives, the oceanographic research ship construction initiative, R/V operational requirements, the ship (i.e. fleet) construction planning initiative and initiatives and action to optimize management and use of Navy deep submersible assets.

In open discussion following his presentation, Mr. Winokur noted that details had not yet been settled on the proposed Naval Institute of Oceanography. Although there are strong reasons for establishing such an institution in Bay St. Louis, Mississippi (where the Naval Oceanographic Office is), that decision or a decision to establish any extensive physical facility for the Institute has not been made.

UNOLS members noted that additional support is needed for the nation's academic oceanographic institutions, that Navy (and ONR) support for academic ocean research is greatly reduced from earlier times and that the impact on UNOLS Institutions of the initiatives described is largely in terms of facilities. Are there other initiatives aimed at basic research capabilities? Mr. Winokur responded that oceanography is already the largest element in ONR's research support and its share is not likely to increase. An increase in ONR's support to basic research must be through an increase in their total basic research funding.

The Chairman next introduced *Dr. D. James Baker, President, Joint Oceanographic Institutions, Inc. (JOI) who elaborated on the satellite report: Oceanography from Space, A Research Strategy for the Decade 1985-1995. July, 1984, Joint Oceanographic Institutions Incorporated, Washington, D.C.* Dr. Baker described the outlook for ocean data from satellites, the status of observational programs, a ten year research program, and potential roles for JOI, UNOLS and other organizations.

Recent events, including the 1982-83 El Nino and the potentially harmful effects of increased carbon dioxide levels in the atmosphere from burning fossil fuels, have emphasized the importance of the oceans in global climate. There is critical need for better understanding of global ocean processes and hence for global ocean observations and information. "Research satellites have demonstrated a remarkable ability to measure ocean variable critical to climate as well as other national concerns including fisheries, transportation, defense, and waste disposal." This satellite information together with data from the interior of the ocean will meet this need.

The report proposes a decade-long initiative, emphasizing satellite technology to gather the ocean information needed to gain better understanding of the oceans and their role in the global climate system. The initiative is necessary to implement the World Climate Research Program (WCRP), its major oceanic components, the Tropical Ocean and the Global Atmosphere (TOGA) and the World Ocean Circulation Experiment (WOCE) and the proposed Global Habitability and International Geosphere-Biosphere programs.

Plans for satellite observations have focused on a set of variables of prime importance to combined program objectives:

Ocean surface wind stress, the major driving force for ocean currents and waves,

surface, intermediate, and deep ocean currents, affecting climate, biogeochemical cycles, and the marine food web,

primary biological productivity, with its important effect on global biogeochemical cycles,

chemistry for insight into large scale, long-term averaged view of ocean currents,

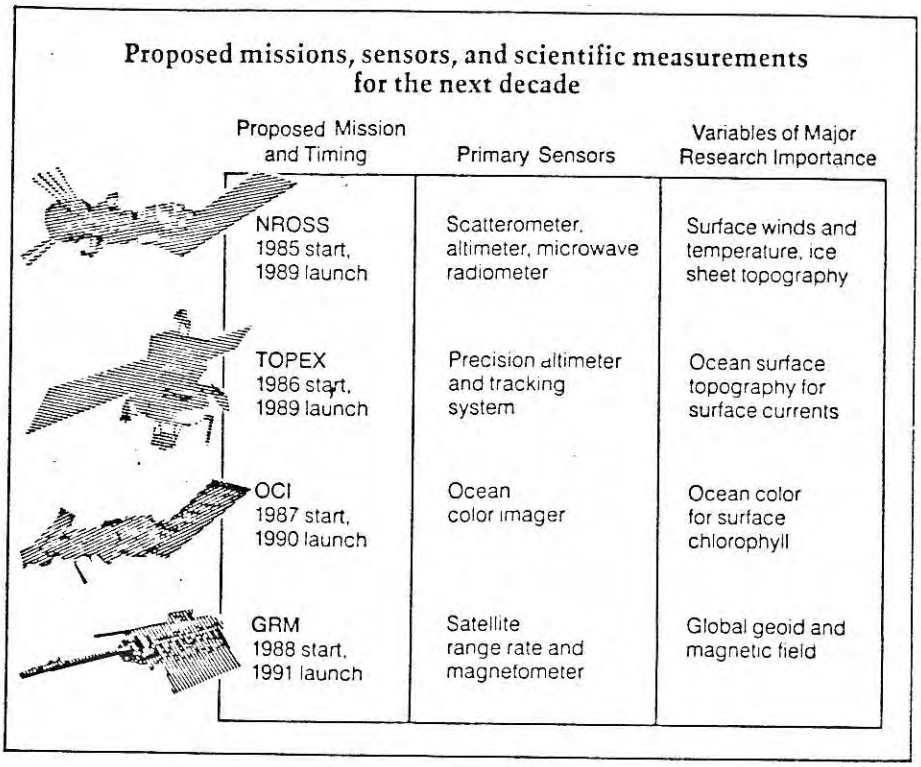
gravity and magnetic fields to help explore geological processes and resources beneath the sea and to help determine absolute currents,

sea surface temperature for studies of the atmosphere and ocean biology, and

sea ice as an influence on and indicator of trends in global climate.

Satellite technology for these observations is well develop and can provide means to achieve global observations of these critical variables.

Four United States satellite missions are proposed to provide the observations: the Navy Remote Ocean Sensing System (NROSS), the Ocean Topography Experiment, (TOPEX), the Oceans Color Image (OCI) and the Geopotential Research Mission (GRM). In addition, the European Space Agency's ERS-1 with its along-track scanning radiometer, synthetic aperture radar would provide valuable observations. The U.S. satellites are characterized in the table below (from the executive summary of Oceanography from space).



The four U.S. missions would cost an estimated $750 million spread over a decade, 1985-1995. *Simultaneous observations from the missions will permit a first comprehensive understanding of the global oceans. The observations from these missions and the resulting understanding will directly benefit maritime activities associated with trade, national defense, fisheries, waste disposal, petroleum and mining.*

JOI, Inc. brings together the collective capabilities of individual institutions to bear on large oceanographic research projects. JOI's basic function is to provide management support and leadership in these programs.

The Corporation is currently responsible for providing the scientific planning and operations management for the new Ocean Drilling Program. The report of the JOI Satellite Planning Committee is an effort to focus collective efforts in ocean sciences.

Before taking up other business, the Chairman noted that Mr. James Gibbons, UNOLS representative from the University of Miami, Rosensteil School of Marine and Atmospheric Science, was retiring from the University, and this would be his last UNOLS meeting. The assembled membership expressed their appreciation for Mr. Gibbons' long and valuable service.

The agenda was rearranged to hear the *Report on the ALVIN Program* prior to the Advisory Council report. *Dr. Robert Corell, Chairman, ALVIN Review Committee* reported that ALVIN operations in 1984 were the most successful ever in terms of number of dives, projects accommodated and breadth of operating areas.

In 1984, the first year using ATLANTIS II as a support vessel, the ALVIN has already (October 24, 1984) completed 142 dives, requiring 227 days at sea, 164 on stations. Operations began along the Atlantic seaboard, continued into the Caribbean, Gulf of Mexico, Panama Basin, East Pacific Rise, Gorda-Juan de Fuca Ridges, Washington-Oregon coasts and to seamounts in the Eastern

Pacific. Two new discoveries were made during 1984: of vent communities near the West Florida Escarpment, Gulf of Mexico, and of 400° C black smokers on Gorda-Juan de Fuca Ridges. Increased capabilities using the ALVIN/ATLANTIS II combination have given this deep submergence research program nearly all ocean capabilities.

Projections for 1985 are for deep submergence investigations in the eastern Pacific from San Diego to the Galapagos and then work in the vicinity of the Hawaiian Island and in the Mariana region and other areas in the western Pacific that would extend into 1986. *(Note: Developments subsequent to the meeting required that the ALVIN/ATLANTIS II return to Woods Hole for maintenance inspection and overhaul in late 1985. Central and western Pacific investigations will be deferred until late 1986-1987.)*

The ALVIN Review Committee (ARC) endorses the continued efforts of Barrie Walden, Manager, the Submersible Program and Marine Operations, all at Woods Hole Oceanographic Institution. Their outstanding efforts notwithstanding, schedules such as that in 1984 overtax the ALVIN Group. Both shore and at sea personnel are overextended under existing conditions. All solutions that have been advanced require staff augmentation.

The UNOLS' ARC will hold a workshop on December 2, just preceding AGU/ASLO meetings in San Francisco to help in planning 1986, 1987 and 1988 operations. Letters of Intent to use ALVIN are being solicited and presentations will be heard on research proposed for ALVIN in 1986-88.

In response to the report and in consideration of their efforts in support of deep submersible oceanographic research, the UNOLS membership commended Mr. Barrie Walden, Manager and the Woods Hole Oceanographic Institution Deep Submergence Group together with Dr. Robert Corell, Chairman, and the ALVIN Review Committee.

UNOLS Advisory Council Report: Dr. Charles B. Miller, Chairman reported in the Council's activities since the last UNOLS meeting. The Council had met twice, on June 28, 29, 1984 in Seattle, and on October 24, 1984 in Washington, D.C.

The Advisory Council conducted a review of UNOLS Member and Associate Member institutions, as called for in the UNOLS Charter (amended and readopted May 24, 1984).

The Advisory Council has reviewed the list of UNOLS Member and Associate Members. We find that all of the Member Institutions are active in the organization and continue to fit the criteria for membership. In the instance of the University of Michigan we recommend that they be urged to enhance their activities in several respects:

1) to strengthen their participation and ties within the UNOLS communities (especially among UNOLS institutions with Great Lakes program),

2) to initiate and promote, with the advise and aid of UNOLS, Great Lakes regional research ship scheduling and interactive utilization of ship facilities, and

3) to enhance their efforts to gain ship support funding from the various Federal agencies that conduct shipboard research in the Great Lakes.

This will strengthen UNOLS overall, improved access to Great Lakes research for scientists generally, and stengthen marine science activities at the University of Michigan.

On their first review, the Advisory Council noted that some Associate Member Institutions appeared to be inactive. The Council recommended that UNOLS' Executive Committee inquire as to their continued interest and activity. Responses to those inquiries were heartening. Almost all of the institutions queried responded that they have continued interest, in UNOLS, citing for example, Safety Standards, information in UNOLS reports and workshops as helpful. These institutions generally maintain oceanographic activities appropriate for Associate Members.

As a consequence of their review *the Advisory Council recommended that UNOLS reaffirm the Associate Membership of the 34 institutions currently designated.*

(Formal introduction of Council recommendations on membership as well as those below on designation of UNOLS ships and on a UNOLS Committee for Specialized Facilities was held until the business portion of the meeting -- reported below.)

The Council also reviewed ships operated by UNOLS Members to prepare recommendations to UNOLS for designation in the UNOLS fleet. (Procedure outlined in UNOLS Charter.) *The Advisory Council recommends that those vessels on the List of Research Vessels Operated by UNOLS Institutions (dated 3/6/84) be designated UNOLS vessels with the exceptions and augmentations noted:* the KANA KEOKI and the LONGHORN not be designated; the FRED MOORE and the LAURENTIAN be added to the list. Later, the Advisory Council *revised their recommendation to include the ROBERT GORDON SPROUL and to delete the ELLEN B. SCRIPPS on the list of designated vessels.* The complete list of vessels recommended for designation is included in the portion of this report covering UNOLS business.

The Advisory Council heard presentation of the University of Southern California's plans for conversion and operation of the OSPREY as a research vessel. In addition, based on reports from the Chairman, Fleet Replacement Committee, information from various UNOLS institutions and from funding agencies and recommendations from Ship Scheduling Meetings, the Council reviewed critical aspects of UNOLS fleet management and distribution. On the basis of their review the Council reached a set of interlocking recommendations concerning reassignments and/or replacements of research vessels within the fleet and an additional recommendation concerning R/V OSPREY plans and proposals. (These Advisory Council recommendations are in Appendix IV.)

The Council has, for some time, been concerned with the need to make emerging new technologies available to the academic institutions in the UNOLS community. To date, the Advisory Council's efforts to identify appropriate technologies and to foster arrangements to implement their use in academic

oceanography have been largely unproductive. The Council remains convinced, however, that there is an opportunity for UNOLS to help advance oceanographic research by seeking arrangements for employing new technology. To that end the Council is making recommendation to UNOLS for the establishment of a Special Facilities Community:

Adding New Technologies to UNOLS' Capabilities

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

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

We propose the following charges for the Special Facilities Committee:

1) To review the range of emerging technology and to select systems that will substantially enhance the progress of ocean research as candidates for establishment as National oceanographic Facilities.

2) To work directly with government agencies to develop new sources of funding for new capabilities. For example, we foresee that new funds can be appropriated for use by NSF and ONR specifically for support of high technology oceanographic facilities. The Special Facilities Committee should assist with promoting these new appropriations and should take a strong role in designing the review and distribution system for them.

3) To seek operating institutions for high technology National Oceanographic Facilities. These operating institutions will be expected to model their stewardship of facilities after the operation of ALVIN by Woods Hole Oceanographic Institution, seeking to serve a community-wide user group.

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

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

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

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

In general discussion it was noted that a subcommittee chaired by Dr. Brian Lewis and formed within the Advisory Committee to the Ocean Sciences Division, National Science Foundation is addressing some of these same issues, and aims to have recommendations by mid-1985. In addition, a group under Brian Lewis is examining the need for and availability of MCS ships to recommend means to acquire and make available state-of-the-art MCS capabilities. Noting that a UNOLS Committee should be coordinated with the OCE Advisory Committee group, the recommendation for a UNOLS Special Facilities Committee was tabled until the business portion of the meeting.

Reports from Federal Agencies were heard next, to accommodate various schedules among participants. *Rear Admiral Charles K. Townsend, Director of NOAA's Office of Marine Operations* reported that NOAA's ship operations schedule for 1985 has been firmed up. All of NOAA's ships except the OCEANOGRAPHER are funded and will operate. NOAA is continuing its recently-noted efforts to upgrade scientific equipment on the fleet, and to encourage ancillary scientific projects on its ships.

Mr. R. R. La Count, Head, Oceanographic Facilities Support Section (OFS), NSF noted that the Foundation is in early stages of budget preparation for 1986, too early for him to forecast details concerning support for ships, operations and facilities.

In NSF budget development and other management processes, the roles and activities are noted. Among UNOLS activities over the past few years he commended the Submersible Science Study (April, 1982) that helped lead to new installations on the ATLANTIS II for ALVIN support and to upgrading the ALVIN. Work of the Fleet Replacement Committee and their coordination with University of Texas work to specify, design and build a modern geophysical and general purpose research vessel are forming a credible basis for ship construction. Much time and effort from the Advisory Council has led to improvements in UNOLS fleet management and valued advice on actions that might affect the fleet. The UNEPC is functioning and has initiated procedures helpful in advance planning. And the ALVIN Review Committee's efforts supporting deep submergence research have helped make that program exciting and valuable.

Mr. La Count expressed appreciation of the efforts of UNOLS ship scheduling groups, while noting that problems remain in the scheduling process: a means must be found to reach effective schedules reflecting credible funding estimate much earlier in the scheduling process.

The Ocean Sciences Advisory Committee is formulating recommended initiative to be released soon for the National Science Foundation's oceanographic research over the next decade. UNOLS advice on the ship and other facility requirements implied in the recommended program will be valued.

Ms. Sandra Toye, Director, Ocean Drilling Program discussed progress on that program, noting the soon-to-be-operational ship RESOLUTION. The program is managed through JOI, Inc. with the nominal budget:

	U.S. Funds $M	International Funds $M	Total Funds $M
Ocean Drilling Program, Ops	20.0	10.0	30.0
Deep Sea Drilling Program	1.1	1.0	2.1
Research for Ocean Drilling (Geophysical surveys, experimental design, etc.)	6.5	0	6.5
TOTAL	27.6	11.0	38.6

The RESOLUTION is scheduled to work from one and one half to two years in the North Atlantic and the Caribbean, for which site work is done or in process. The program is next scheduled into the Wedell Sea (1986-87 Austral summer) and about two years each in the Indian Ocean and Western Pacific.

There is interest, in the research portion of the program, for exploiting opportunity to use the drilling ship as an exceptional facility for time series research projects ancillary to drilling (e.g., biological, chemical studies).

Keith Kaulum, Office of Naval Research commended both the Fleet Replacement Committee and the ALVIN Review Committee for their prompt, very useful response to ONR in formulating plans for Navy initiatives on research ship construction and on expanded scientific utilization of the submersible SEA CLIFF and TURTLE. The UNOLS efforts in progress by those two Committees and the credibility of their responses is proving very useful to ONR and the Navy.

The project to stretch and augment capabilities on the MOANA WAVE is being completed on schedule and below budget, and has been well managed by the University of Hawaii. The renovated MOANA WAVE should be very useful in the UNOLS fleet.

Dr. Thomas C. Aldrich, USGS, Geology Division, Office of Marine Geology, Atlantic Branch reported that USGS anticipates increased funding and an expanded program in marine geology over the next few years (perhaps to levels of about $50 M/year). Emphasis will be on the Exclusive Economic Zone

program. Traditionally the Atlantic Branch has used UNOLS ships while the Pacific Branch has operated their own ships. In part because personnel increases are not expected in connection with funding increases, the USGS hopes to increase their support both to academic researchers and to the UNOLS fleet. A modest level of UNOLS ship use is projected for 1985, with significant increases in 1986 and 1987.

The USGS is working with IOS in England, processing recent GLORIA surveys in the EEZ.

Dr. George Shor, Chairman reported on activities of the UNOLS National Expeditionary Planning Committee (UNEPC). During its first year UNEPC had some success in gaining an information base for the systematic advanced planning of UNOLS expeditionary ship operations. Information came mainly from Notices of Intent solicited from and submitted by individual investigators. Summaries of ship plans for 1985-1987 were published in EOS and in UNOLS News. In December, 1984 UNEPC will host a workshop to gain information about expeditionary work forecast for 1987 through 1989. This year's workshop will not include presentations from individual investigators, but will hear about program plans and expeditionary ship need forecasts from Federal agencies and program offices:

National Science Foundation,	Division of Polar Programs Ocean Drilling Program
Office of Naval Research,	Geophysical Sciences Division Environmental Sciences Division
JOI, Inc.,	Regional survey needs in Indian Ocean and Western Pacific- Regional Panel Chairman
Program Offices,	TOGA (in NOAA) WOCE (planning group) TROPIC HEAT.

At the UNEPC meeting October 25, 1984 Dr. Peter E. Wilkness, Director and Bernhard H. Lettau, Division of Polar Programs/NSF and Garrett W. Brass, Ocean Drilling Program gave preliminary information on ship needs for 1986-1988. The UNEPC meeting report is Appendix V.

Captain Robertson P. Dinsmore, Chairman reported on meetings and activities of the Fleet Replacement Committee. His written report (Appendix VI) includes a schedule of events in the UNOLS fleet replacement process, beginning with the completion of five G & G ship conceptual designs for the University of Texas (September, 1984), through the beginning of preliminary design studies for one or more new ship plans (April, 1985). The report also includes a Tentative UNOLS Fleet Replacement Plan with Scientific Mission Requirements for three research ships: large, high-endurance, general purpose, medium endurance, general purpose; and large, high performance general purpose -- the last generally expected to be a SWATH design.

In addition to the Chairman, FRC includes George Keller, John Martin, David Menzel, Worth Nowlin, Joe Phillips, Fred Speiss and Derek Spencer. In their meetings over the last six months the FRC has been asked to specify what kinds of ships would be required (i.e., ship characteristics) and then when and where ships should be provided, that is, formulate a replacement plan for the rest of the century.

Several points have been established: Priorities for improved scientific requirements include stability, overside handling and improved laboratories; larger ships are being addressed first because present ones are older and include the most deficient. Three classes of general purpose research vessels have emerged: high endurance (260-280 ft), medium endurance (210-220 ft) and high performance (SWATH). Geophysical ships will be specialized because of space and handling requirements for streamers, guns, compressors, etc. The next step is to complete conceptual design studies, one or two for each of the three classes considered.

As noted, pressure from Navy initiatives required a fleet replacement plan almost immediately. In devising the plan criteria were that it be: responsive to research trends, realistic in terms of national economy and credible for budget purposes and have approval of the academic community. It needs a logical implementation plan and will require periodic updating. FRC assumptions were that the plan should project needs through the year 2000. Individual ship replacements would be based on age, material condition, ship capabilities and existing or projected deficiencies. The number and mix of ships in the UNOLS fleet would remain about as at present; significant additions would be of specialized ships (e.g., geology and geophysics, submersible support, polar research).

With those criteria and assumptions, the FRC reached the first order replacement plan (in the table in Appendix VI).

Captain Dinsmore urged that those in the UNOLS community examine the scientific Mission Requirements for each of the three classes of ships being considered (Appendix VI). Those requirements will drive later stages of the ship replacement process. If those requirements stand, that's what the community will get.

After the presentation, *UNOLS Members expressed their appreciation for the efforts of Captain Dinsmore and other members of the UNOLS Fleet Replacement Committee.*

Research Vessel Operators Council (RVOC) Meeting. Ms. Dolly Dieter reported on the October meeting of RVOC at the Bermuda Biological Station. The meeting report, including agenda, has been distributed separately.

It was concluded that problems concerning Shared Use Equipment warranted extensive work among UNOLS institutions and that *a UNOLS workshop should be held to address Shared Use Equipment and Marine Technician problems.*

The RVOC urged that the current draft revision of UNOLS Safety Standards be adopted by UNOLS. A Standing Committee was established to keep Safety Standards up to date. The Committee: T. K. Treadwell, Chair, K. Palfrey, E. Allmendinger, E. Nelson, J. Williams, J. Bash and W. Mitchell members.

A workshop on vessel stability will be held in conjunction with the 1985 RVOC meeting. E. Allmendinger will convene.

Captain Dinsmore reported on the joint meeting of the East and West Regional Ship Scheduling Groups, October 25, 1985 (Appendix VII). As seen in the table below, 1984 cost estimates have converged with funding available (i.e., no shortfall anticipated).

PROFILE OF FUNDING CYCLES
$MILLION

	OP DAYS	NSF	ONR	OTHER	TOTAL	SHORT FALL
1982	4,399	21.2	3.4	4.8	29.4	-----
1983	4,494	23.4	3.9	5.3	32.6	-----
1984 OPERATIONS						
May '83 Projection	6,016	28.7	4.4	6.4	39.5	
(Anticipated)		(25.4)	(4.1)	(6.4)	(35.9)	($0.4)
Oct. '83 Projection	5,892	27.4	5.0	8.3	40.7	
(Anticipated)		(25.0)	(4.5)	(8.0)	(37.5)	($3.2)
Feb., Mar., '84 Projection	5,435	25.5	4.8	7.9	38.2	
(Anticipated)		(24.3)	(4.8)	(7.2)	(36.2)	($2.0)
May '84 Projection	5,210	24.7	4.8	7.2	36.7	
(Anticipated)		(24.3)	(4.8)	(7.2)	(36.2)	($0.4)
Oct. '84 Projection	4,982	24.2	4.3	7.3	35.8	
(Anticipated)		(24.2)	(4.3)	(7.3)	(35.8)	-----

Projections for 1985 are for further increase in operating days (to 5,213) and for a shortfall of $3.4 million.

The KNORR is the only large ship scheduled for work in the north Atlantic, and is presently scheduled for only 188 days. On present schedules the ATLANTIS II (with ALVIN), CONRAD, MOANA WAVE, THOMPSON and WASHINGTON would all end 1985 in the Western Pacific. (Note: Schedule changes subsequent to this meeting have changed that situation.)

One University of Miami ship does not have a full schedule. (In the projections below, no funds or schedule are included for the CAPE FLORIDA.)

Some work in the South Atlantic has not been scheduled yet.

EAST-WEST SCHEDULING MEETING
October 25, 1984
Summary of 1985 Cost Projections

Projections made October 25, 1984

	OP DAYS	$Million NSF	ONR	OTHER	TOTAL
EAST	2,758	14.782	2.354	2.442	19.578
WEST	2,455	13.610	1.835	1.765	17.223
TOTAL	5,213	28.392	4.189	4.207	36.791
ANTICIPATED	-	25.0	4.2	4.2	33.4
PROJECTED SHORTFALL	-	3.392	-	-	$ 3.392

Similar Projections, May 23, 1984

EAST	3,435	15.894	3.094	5.215	24.203
WEST	2,564	15.098	1.785	1.373	18.257
TOTAL	5,999	30.992	4.879	6.588	42.460

Similar Projections, February, March, 1984

EAST	3,268	13.926	2.987	6.482	23.395
WEST	2,621	14.776	2.422	1.137	18.336
TOTAL	5,889	28.702	5.409	7.619	41.731

UNOLS Business. Business requiring action by the UNOLS Member and Associate Member Institutions were considered in this part of the meeting.

Revised UNOLS Research Vessel Safety Standards. A Draft revision of UNOLS Safety Standards was introduced for adoption by Working Group Chairman T. K. Treadwell. These Standards had first been presented to UNOLS at the May, 1984 meeting, and had even earlier been circulated to all UNOLS Members, Associated Members and RVOC representatives for review. Nevertheless, two points of contention were raised concerning the current draft: The section on scientific diving was not universally agreed to. The general sense of the meeting was that the UNOLS Safety Standards should include some comprehensive set of diving standards (e.g., those by AAUS) by reference. A second point was raised concerning applicability of the Safety Standards -- to designated UNOLS vessels or to all research vessels operated by UNOLS institutions. The sense of the meeting was that the Standards themselves should not specify that point.

After discussion it was determined that the points raised could not be clearly resolved at the meeting. *The Executive Secretary was directd to circulate the draft revision UNOLS Research Vessels Safety Standards to UNOLS Members, Associate members and the RVOC together with copies of the referenced AAUS Diving Standards and with a request for institutional review so that the standards could be introduced for adoption at the May, 1985 UNOLS SemiAnnual Meeting.*

The Advisory Council recommendation to reaffirm the status of all current UNOLS Members was introduced.

UNOLS Members reaffirmed the current Member institutions (as listed below):

University of Alaska
University of Delaware
Duke/University of North Carolina
University of Hawaii
The Johns Hopkins University
Columbia University, Lamont-Doherty Geological Observatory
University of Miami, Rosensteil School of Marine and Atmospheric Sciences
University of Michigan, Great Lakes and Marine Waters Center
Moss Landing Marine Laboratories
Oregon State University
University of Rhode Island
University of California San Diego, Scripps
University System of Georgia Skidaway Institute of Oceanography
University of Southern California
University of Texas
Texas A & M University
University of Washington
Woods Hole Oceanographic Institution

The Advisory Council recommendation to reaffirm the Status of all current UNOLS Associate Members was introduced.

UNOLS Members reaffirmed the current Associate Member institutions (as listed below):

University of Alabama
Bermuda Biological Station
Bigelow Laboratory for Ocean Sciences
Brookhaven National Laboratory
University of California, Santa Barbara
Cape Fear Technical Institute
University of Connecticut
Florida Institute for Oceanography
Florida Institute of Technology
Florida State University
Harbor Branch Foundation
Hobart & William Smith College
Lehigh University
Louisiana Universities Marine Consortium
University of Maine
Marine Science Consortium
University of Maryland
Massachusetts Institute of Technology
Naval Postgraduate School
University of New Hampshire
New York State University College at Buffalo
State University of New York at Stony Brook
North Carolina State University
University of North Carolina at Wilmington
NOVA University
Occidental College
Old Dominion University
University of Puerto Rico
San Diego State University
University of South Florida
Virginia Institute of Marine Science
Walla Walla College
University of Wisconsin at Madison
University of Wisconsin at Milwaukee

The Advisory Council recommendations for designation as UNOLS ships were introduced. *The UNOLS Membership designated the following as UNOLS ships:*

MOANA WAVE	*University of Hawaii*
ALPHA HELIX	*University of Alaska*
T. G. THOMPSON *C. A. BARNES*	*University of Washington*
WECOMA	*Oregon State University*
CAYUSE	*Moss Landing Marine Laboratories*
VELERO IV	*University of Southern California*
MELVILLE *T. WASHINGTON* *NEW HORIZON* *ROBERT G. SPROUL*	*University of California, San Diego* *Scripps Institution of Oceanography*
GYRE	*Texas A & M University*
FRED H. MOORE	*University of Texas*
LAURENTIAN	*University of Michigan*
ISELIN *CAPE FLORIDA* *CALANUS*	*University of Miami, Rosensteil* *School of Marine and Atmospheric* *Sciences*
BLUE FIN	*University System of Georgia* *Skidaway Institute of Oceanography*
CAPE HATTERAS	*Duke/University of North Carolina*
R. WARFIELD	*Johns Hopkins University*
CAPE HENLOPEN	*University of Delaware*
CONRAD	*Columbia University, Lamont-* *Doherty Geological Observatory*
ENDEAVOR	*University of Rhode Island*
KNORR *ATLANTIS II* *OCEANUS*	*Woods Hole Oceanographic Institution*

The Advisory Council recommendation to reaffirm the ALVIN as UNOLS National Oceanographic Facility was introduced. The UNOLS Membership reaffirmed ALVIN as a UNOLS National Oceanographic Facility.

The Advisory Council recommendation to form a UNOLS Special Facilities Committee was introduced. (The text is earlier in this report.) UNOLS membership asked for clarification on the manner of coordination between such a committee and the similar Subcommittee under the Advisory Committee to the Ocean Sciences Division. The recommendation was then tabled. *The Executive Secretary was directed to circulate the recommendation to form a UNOLS Special Facilities Committee among UNOLS Members for their approval or disapproval. Circulation should be after agreed coordination between the Advisory Council and the Subcommittee, Advisory Committee to OCE.*

The meeting was adjourned at 3:40 p.m.

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

SEMIANNUAL MEETING
AGENDA

0830, Friday, October 26, 1984
Washington Conference Center
National Association of Realtors
777 14th Street N.W.
Washington, D.C.

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

NAVY INITIATIVES IN OCEANOGRAPHY - *Robert S. Winokur, ONR, will report on the Secretary of Navy's Initiatives in Oceanography, of interest to UNOLS and the academic community.*

JOINT OCEANOGRAPHIC INSTITUTIONS, INC. - *Dr. D. James Baker, President, JOI, Inc.*

UNOLS ADVISORY COUNCIL - *Dr. Charles Miller will report on Council activities, including their recommendations on UNOLS Membership and Associate Membership, their recommendations on ships designated a part of the UNOLS fleet and their re-examination of UNOLS Fleet Composition, Distribution and Management.*

REPORT ON ALVIN PROGRAM - *Dr. Robert Corell, Chairman ALVIN Review Committee, will report on the status of the ALVIN program for 1985, 1986 and beyond.*

REPORT ON UNOLS NATIONAL EXPEDITIONARY PLANNING PROCESS - *Dr. Marcus Langseth, Acting Chairman, UNEPC will report on planning progress.*

1200-1330 LUNCH 1200-1330

REPORT FROM THE UNOLS FLEET REPLACEMENT COMMITTEE - *Captain Robertson P. Dinsmore will report on Committee activities and progress together with related activities.*

REMARKS FROM FEDERAL FUNDING AGENCIES - *Update forecasts of FY85/86 ship support and ocean science funding status - NOAA, NSF, ONR, USGS, MMS and DOE.*

REPORT FROM RESEARCH VESSEL OPERATORS COUNCIL - *Ms. E. R. Dieter, Chairman, will report on RVOC's annual meeting and activities.*

REPORT OF REGIONAL SHIP SCHEDULING GROUPS - JOINT MEETING - *Captain Robertson P. Dinsmore and Dr. Brian Lewis, Chairman*

UNOLS ORGANIZATIONAL BUSINESS - *The UNOLS Membership will consider Advisory Council recommendations on Members, Associate Members and the designation of UNOLS vessels.*

The membership will consider for adoption draft Research Vessel Safety Standards prepared by RVOC working group.

UNOLS SEMIANNUAL MEETING
Attendees

Thomas C. Aldrich, U.S. Geological Survey
D. James Baker, Joint Oceanographic Institutions
William D. Barbee, UNOLS Office
John F. Bash, University of Rhode Island
Alfred M. Beeton, University of Michigan*
Donald F. Boesch, Louisiana Universities Marine Consortium
Larry Clark, National Science Foundation
Thomas Cocke, State Department
Thomas N. Cooley, National Science Foundation
Robert W. Corell, University of New Hampshire
Bruce K. Cornwall, Johns Hopkins University*
Dolly Dieter, University of Alaska
Robert Dinsmore, Woods Hole Oceanographic Institution
William Erb, State Department
James Gibbons, University of Miami*
Donn S. Gorsline, University of Southern California*
George D. Grice, Woods Hole Oceanographic Institution*
James J. Griffin, University of Rhode Island*
Charles E. Helsley, Hawaii Institute of Geophysics*
William Jeffers, University of Washington
Thomas C. Johnson, Duke University
Jay T. Katz, University of Michigan
Keith Kaulum, Office of Naval Research
Marcus Langseth, Lamont-Doherty Geological Observatory*
Brian Lewis, University of Washington*
R. R. La Count, National Science Foundation
Carl Lorenzen, University of Washington
Thomas C. Malone, University of Maryland
John H. Martin, Moss Landing Marine Laboratory*
Arthur E. Maxwell, University of Texas*
Nancy McGee, Naval Post Graduate School
John G. McMillan, National Science Foundation
David W. Menzel, Skidaway Institute of Oceanography*
Charles B. Miller, Oregon State University*
William H. Mitchell, University of Texas at Austin
Lynda S. Murphy, Bigelow Laboratory for Ocean Sciences
Michael Rawson, Lamont-Doherty Geological Observatory
Bruce H. Robison, University of California at Santa Barbara
Thomas C. Royer, University of Alaska*
Richard W. Schneider, University of Delaware*
George G. Shor, Jr., Scripps Institute of Oceanography*
Mitchell Stebens, UNOLS Office
Charles Townsend, National Oceanic & Atmospheric Administration
Sandra D. Toye, National Science Foundation
T. K. Treadwell, Texas A & M University*
Richard B. Tripp, University of Washington
Joseph F. Ustach, Duke University*
Ferris Webster, University of Delaware
Richard W. West, National Science Foundation
Terry E. Whitledge, Brookhaven National Laboratory
Robert C. Wilson, Scripps Institution of Oceanography
Robert Winokur, Office of Naval Research
Redfield Wright, Bermuda Biological Station
Marsh J. Youngbluth, Harbor Branch Foundation
John M. Zeigler, Virginia Institute of Marine Science

*Member Institution Representatives

CNR SHIP MANAGEMENT PROGRAM

- MANAGEMENT RESPONSIBILITY FOR 7 NAVY OWNED ACADEMIC RESEARCH SHIPS TRANSFERRED TO CNR IN 1980
- MANAGEMENT PLAN IMPLEMENTED
- FIVE YEAR $11 MILLION DOLLAR PROGRAM
- MAJOR PROJECTS
  - INSURV INSPECTIONS
  - CONRAD – MIDLIFE REFIT, NEW DESIGN CORE/TRAWL WINCH
  - WASHINGTON – MIDLIFE REFIT
  - THOMPSON – MIDLIFE REFIT
  - MOANA WAVE – STRETCH AND UPGRADE (WITH NSF)
  - MELVILLE – CORRECTION OF MATERIAL DEFICIENCIES
  - ATLANTIS II – CONVERSION AND ALVIN HANDLING SYSTEM (WITH NSF)
  - NEW CTD WINCHES AND WIRE – SIX SHIPS
  - SATELLITE NAVIGATION SYSTEMS – FIVE SHIPS
  - SHIPBOARD DATA SYSTEMS – SIX SHIPS
  - COMMUNICATIONS SYSTEMS – THREE SHIPS
- COMMITMENT TO CONTINUE MAINTENANCE AND UPGRADE PROGRAM

NAVY POLICY ON OCEANOGRAPHY

- SECRETARY OF THE NAVY POLICY STATEMENT OF 17 JULY 1984
- MAJOR REINVIGORATION OF NAVY EFFORTS IN OCEANOGRAPHY
- 15 INITIATIVES FOR IMMEDIATE ACTION

SECNAV OCEANOGRAPHY INITIATIVES

- NAVY CAREER PATHS AND STAFFING
- REORGANIZATION OF OFFICE OF THE OCEANOGRAPHER OF THE NAVY
- BROADEN SCIENTIFIC POOL
  - RESEARCH CHAIRS
  - GRADUATE FELLOWSHIPS
- ESTABLISH INSTITUTE FOR NAVAL OCEANOGRAPHY
  - OCEAN MODELING
- UPGRADE OCEANOGRAPHIC RESEARCH FLEET
  - NEW SHIP
  - SHIP CONSTRUCTION PLAN
- OPTIMIZE USE OF NAVY DEEP SUBMERSIBLE ASSETS
- SUPPORT REMOTE SENSING
- NPGS OCEAN SCIENCE BUILDING
- STRENGTHEN RESOURCES FOR OCEAN SCIENCE PROGRAMS

OCEANOGRAPHIC RESEARCH SHIP INITIATIVE

- SECNAV INITIATIVE
- NAVY–OWNED
- UTILIZED BY ACADEMIC COMMUNITY
- PROBABLY OPERATED BY NAVY FOR TWO YEARS
- FY 87 BUDGET
- OPERATING BY 1991
- SWATH SHIP MOST LIKELY
- TENTATIVE PERFORMANCE SPECIFICATION PREPARED
- COORDINATED WITH NSF AND UNOLS
  - INPUT BY UNOLS SHIP REPLACEMENT COMMITTEE
- BUILD TO COMMERCIAL STANDARDS

OCEANOGRAPHIC RESEARCH SHIP INITIATIVE
PROPOSED OPERATIONAL REQUIREMENT

- 18–22 KNOTS SPEED
- 8000 – 12000 NM RANGE
- 45 – 50 DAYS ENDURANCE
- 28 – 35 SCIENTISTS AND TECHNICIANS
- 12 KNOT TRANSIT THROUGH SEA STATE 6
- STATION KEEPING THROUGH SEA STATE 5 – DYNAMIC POSITIONING
- 3600 SQ FT MAIN DECK WORKING AREA
- 4000 SQ FT LABORATORY SPACE
- STERN A–FRAME
- 15000 – 20000 CU FT SCIENTIFIC STORAGE
- GPS, DEEP OCEAN TRANSPONDERS AND PRECISE TIME KEEPING

RESEARCH SHIP CONSTRUCTION PLAN INITIATIVE

- CNR AND OCEANOGRAPHER OF THE NAVY JOINTLY DEVELOP OCEANOGRAPHIC SHIP CONSTRUCTION PLAN FOR FY 87
- INSURE APPROPRIATE OCEANOGRAPHIC SHIPS ARE AVAILABLE TO MEET OPERATIONAL AND RESEARCH REQUIREMENTS
- INCLUDES NAVOCEANO AND NAVY ACADEMIC SHIPS
- PLAN CURRENTLY UNDER DEVELOPMENT
  - OPTIONS BEING EXAMINED – CONSIDERING REPLACEMENT OF OLDER AGORS AND MODERNIZATION OF KNORR AND MELVILLE

RESEARCH SHIP CONSTRUCTION PLAN INITIATIVE (CONTINUED)

- ACTIONS TO DATE:
  - ENGINEERING ASSESSMENT OF SHIPS COMPLETED
  - UNOLS RECOMMENDATION FOR REPLACEMENT AND REQUIREMENTS
  - NAVY SHIP CHARACTERISTICS IMPROVEMENT BOARD WORKING GROUP ESTABLISHED
- PROGRAM PLAN FOR FY 87 BUDGET CYCLE (FY 87–91) AND EXTENDED PLANNING ANNEX (FY 92–97)
- COORDINATED PLANNING WITH NSF AND FOFCC

NAVY DEEP SUBMERSIBLE ASSETS

- DRAFT PLAN TO OPTIMIZE MANAGEMENT AND USE OF DEEP SUBMERGENCE ASSETS
- PLAN FOCUSES ON DSV SEA CLIFF AND TURTLE
- RESEARCH INPUT BASED ON RECOMMENDATIONS OF UNOLS ALVIN REVIEW COMMITTEE PANEL
- PROPOSED ELEMENTS
  - IMPROVED TECHNICAL SUPPORT ARRANGEMENT
  - USER FEE SIMILAR TO ALVIN FOR OPERATIONS, TECHNICAL SUPPORT AND SCIENTIFIC EQUIPMENT
  - 60 DAYS PER YEAR FOR RESEARCH – FY 86
  - ONR TO ACT AS INTERFACE
  - MAJOR DEDICATED PROGRAM WITH SEA CLIFF IN FIRST YEAR
  - ACQUIRE SUITABLE LONG RANGE SUPPORT SHIP
  - DEVELOP A FRAME CAPABILITY FOR WORLDWIDE OPERATIONS
  - ENHANCED ROV CAPABILITY

ADVISORY COUNCIL RECOMMENDATIONS ON SHIP REPLACEMENT AND/OR REASSIGNMENTS

RECOMMENDATION
OCTOBER 25, 1984

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

RECOMMENDATION 1

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

RECOMMENDATION 2

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

RECOMMENDATION 3

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

RECOMMENDATION 4

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

UNOLS Advisory Council Recommendation Regarding R/V OSPREY

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

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

a) conversion plans and costs together with the basis for estimation;

b) an analysis of the user market foreseen for OSPREY;

c) expected operating costs.

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

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

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

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

UNOLS NATIONAL EXPEDITIONARY PLANNING COMMITTEE (UNEPC)
REPORT OF MEETING
OCTOBER 25, 1984

The UNEPC met, together with observers and agency officials on October 25, 1984, at the National Science Foundation, 1800 G Street N.W., Washington, D.C.

The meeting was called to order at 2:30 p.m. by *George Shor, Chairman.* Attendees who signed the registration sheet are on the attached list.

George Shor described the UNEPC workshop to be held December 7, 1984 in San Francisco (on the last day of AGU/ASLO meetings). Last year's format emphasizing presentations on intended research by potential principal investigators was not very successful. Although about 40 investigators submitted written Notices of Intent, thus providing useful information for advanced planning, only a handful made presentations on attended meetings. The 1984 meeting will emphasize presentations on program direction, 1987 and beyond. Agencies or program offices to be contacted include:

ONR - all ocean science divisions
NSF/DPP
NSF/ODP
WOCE
TOGA
JOI, Inc. - regional panels

The offices making presentations will be asked to indicate their programs' ship requirements from the UNOLS fleet.

Peter Wilkness, Director and Bernhard Lettau, National Science Foundation's Division of Polar Programs provided information on the Division's oceanographic programs, plans and requirements for UNOLS ships.

There have been several studies on the need for research vessel(s) with icebreaker capabilities. Recently NOAA, NSF and the Navy have sent a combined summary of their agency program requirements to the Office of Management and Budget for comment and reaction. Comment from DPP is that an adequately strengthened scientific capability in high latitude oceans supports the need for a civilian icebreaker-research vessel.

The conversion study on the POLAR DUKE has been completed, and the ship will be in New York in November. DPP cannot yet determine the impact of POLAR DUKE on their ocean programs or on DPP use of UNOLS ships. Clearly POLAR DUKE is more capable than was HERO and will do more. It is, as yet, uncertain how much of the ship's time will be available for ocean investigations. POLAR DUKE will not support investigations in marine geology and geophysics, because the ship is not equipped for them. DPP anticipates about $1 million in FY-1986 for polar operations in marine geology and geophysics; one or more UNOLS ships could participate.

DPP may support 40 or more days high latitude (southern) ship operations in the 1985-86 season.

In general discussion the two Division officials noted that in the future POLAR DUKE could work north of 60 S but that it was most unlikely that the ship would work north of the equator. Initially POLAR DUKE will base at Punta Arenas.

In the Arctic, DPP considers ISHTAR a five year program. In addition the Division has several proposals for physical investigations in the Norwegian Sea and Arctic Ocean.

Dr. Wilkness noted that DPP will seek consultation from the academic community in defining the Division's lead role for the Arctic Research and Policy Act.

Sandra Toye, Director and Garrett Brass, National Science Foundation's Ocean Drilling Program discussed status and expectations of the drilling program.

The new drilling ship (since the meeting the name RESOLUTION has been accepted) will operate in the North Atlantic and Mediterranean for about 11 1/2 years. Sites survey requirements have been met there. Next work will be in the Wedell Sea in Austral summer 1986-87, followed by two years in the Indian Ocean (with perhaps a second southern ocean program in the included austral summer). The next requirement for site survey activities would be for the Indian Ocean. Site panels will anounce requirements. Emphasis will shift toward regional geophysical studies. The studies would be funded through the ODP office. For planning, about three studies per year are contemplated, each including 90-120 ship days.

Prospective participants should attend workshops that will lay out study objectives, etc.

Prompted by general discussion and interest, the ODP representatives noted that they had tentative plans to support from the RESOLUTION appropriate investigations not directly connected with drilling (i.e., funds might be available to support oceanographic investigations that could take advantage of the ship's excellent laboratories, its itinerary and schedule).

UNEPC Attendees

William D. Barbee	UNOLS Office
Jack Bash	University of Rhode Island
Thomas N. Cooley	OFS/National Science Foundation
Robert Corell	University of New Hampshire
James Griffin	University of Rhode Island
Don Heinrichs	National Science Foundation
Charles Helsley	Hawaii Institute of Geophysics
Bill Jeffers	University of Washington
Marcus Langseth	Lamont-Doherty Geological Observatory
Bernard Lettau	DPP/National Science Foundation
Brian Lewis	University of Washington
Bruce Malfait	SGG/National Science Foundation
John G. McMillan	OFS/National Science Foundation
William H. Mitchell	University of Texas, Institute for Geophysics
Ron Moller	Woods Hole Oceanographic Institution
Michael Rawson	Lamont-Doherty Geological Observatory
Mitchell Stebens	UNOLS Office
Sandra Toye	ODP/National Science Foundation
Barrie Walden	Woods Hole Oceanogrpahic Institution
Peter Wilkness	DPP/National Science Foundation
Robert Wilson	Scripps Institution of Oceanography

SCHEDULE OF EVENTS FOR UNOLS FLEET REPLACEMENT PROCESS

1984

SEPT - Conceptual Designs for Five G&G Ships Completed for University of Texas (includes one SWATH)

OCT - Outline Draft of Long-Range Replacement Plan

NOV - Conceptual Designs Underway for:

- Large General Purpose R/V
- Large SWATH R/V
- Medium Large General Purpose R/V
- (Five UTIG Concept Designs Converted to General Purpose ?)

DEC - Inspection and Cruise of 3,000-Ton Japanese SWATH

- Comparative Model Tests on Two SWATH Hulls

1985

JAN - First Draft of Requirements and Plan for Ship Replacement

- Commence Conceptual Design Study for Coastal SWATH Research Vessel

FEB - First Round of Conceptual Design Studies (large ships) Completed and Circulated for Review

MAR - Second Draft of Requirements and Plan for Ship Replacement

- Community-Wide Workshop for Review of Ship Requirements, planning, and Conceptual Designs. Recommendations for Proceeding on Next Phases of Plan.

APR - Final Draft of Requirements and Plan for Ship Replacement

- Commence Preliminary Design Studies for One or More New Ship Plans

R. P. Dinsmore
Rev. 15 October 1984

BACKGROUND OF TENTATIVE UNOLS FLEET REPLACEMENT PLAN

The recent Navy initiatives in oceanography include support for replacement of university research vessels. In order to implement this initiative and to include it within the earliest Navy budget planning cycle (called POM-87), an overall UNOLS replacement plan was requested as a matter of urgency (due 30 September 1984). In order to meet the Navy need, a "tentative plan" was formulated based on existing UNOLS documents and several hastily called conferences.

The Navy principally is concerned with the five-year cycle starting at FY-1987. The plan largely revolves around construction of three new large general purpose ships: one a SWATH (tied in with another Navy initiative) which is termed "high performance AGOR"; the second which is a large "high endurance AGOR" around which UNOLS requirements have been developed; and the third is a "medium endurance AGOR" about the size of existing large UNOLS ships. The Navy further suggested modernizing the two newest large ships (MELVILLE and KNORR) to extend their service life to 30-40 years.

The tentative plan otherwise submits a scheme to replace the existing fleet on about a 30-year age basis. It does, however, address four new specialized ships chiefly so that these requirements carried from earlier plans should not be overlooked. Their continuation in the plan should be examined closely.

TENTATIVE UNOLS FLEET REPLACEMENT PLAN

Introduction

The need to plan for new, more capable research ships to conduct scientific programs at sea has become a matter of urgency. Numerous studies have amply demonstrated that by the 1990's most ships will be obsolete in terms of capability to keep up with the growing requirements of modern seagoing oceanographic programs. Large high performance overside handling arrangements and modern state-of-the-art shipboard laboratories will be needed to meet major ongoing ocean programs. In addition, a high quality working environment is essential in order to attract competent seagong personnel.

Replacement Criteria

Fleet replacement plan is based upon needs envisioned by CY 2000. Overall numbers and mix of ships is not significantly different from current inventory. Major additions are in areas of specialized type capabilities and include geophysics, submersible handling and polar research. Basic criteria of plan are:

- It should be responsive to the anticipated future trends of oceanographic research and engineering.
- It should be realistic in terms of the national economy.
- It should bear the general approval of the academic community.
- It should be sufficiently creditable to compete in the Federal funding infrastructure.
- It should provide a logical implementation scheme bridging the current and projected time frame.
- It should provide for periodic updating.

University-National Oceanographic Laboratory System (UNOLS)

Ship Name	LOA (ft)	Date Built	Displ. Tons	Owner	Operator
			Class II 200-274 Ft.		
MELVILLE (AGOR-14)	245	1969	2,075	U.S.Navy	Scripps
KNORR (AGOR-15)	245	1969	1,915	U.S.Navy	Woods Hole
ATLANTIS II	210	1963	2,300	N S F	Woods Hole
T.WASHINGTON (AGOR-10)	209	1965	1,362	U.S.Navy	Scripps
T.G.THOMPSON (AGOR-9)	209	1965	1,302	U.S.Navy	U. of Wash.
CONRAD (AGOR-3)	209	1962	1,425	U.S.Navy	Lamont-Doherty
			Class III 150-199 Ft.		
OCEANUS	177	1975	960	N S F	Woods Hole
WECOMA	177	1975	1,015	N S F	Oregon State U.
ENDEAVOR	177	1976	962	N S F	U. R. I.
GYRE (AGOR-21)	182	1973	980	U.S.Navy	Texas A & M
MOANA WAVE (AGOR-22)	213	1973	950	U.S.Navy	U. of Hawaii
ISELIN	170	1971	830	N S F	U. of Miami
NEW HORIZON	170	1978	830	Univ. Calif.	Scripps
			Class IV 100-149 Ft.		
CAPE FLORIDA	135	1981	539	N S F	U. of Miami
CAPE HATTERAS	135	1981	539	N S F	Duke Univ.
ALPHA HELIX	133	1965	554	N S F	U. of Alaska
CAPE HENLOPEN	120	1975	165	U. Del.	U. of Delaware
VELERO IV	110	1948	650	U. S. C.	So. Cal. Univ.
R.WARFIELD	106	1967	162	N S F	Johns Hopkins
R.G.SPROUL	125	1981	520	Univ. Calif.	Scripps
			Specialized Ships		
GEOPHYSICS					
FRED MOORE	165	1967	992	Univ. Texas	Univ. Texas
SUBMERSIBLE HANDLING					
(ATLANTIS II	210	1963	2,300	N S F	Woods Hole)

Time frame and ship types are based upon:

- Age and material condition of existing ships
- Deficiencies in capability of existing vessels

Outline of Plan

Fleet replacement by five-year increments is given by the following table:

Time Frame	Class I & II	Class III	Class IV	Specialized
1985-89	2 new (modernize 2)		1 new	1 G&G
1990-94	1 new		1 new	1 Polar R/V
1995-1999	1 new	2 new	1 new	1 Sub Handlin 1 G&G
2000-2004		2 new	2 new	
2005-2009		3 new		
2010-2014	2 new		2 new	
Total	6	7	7	4

Notes:
1. Two Class II ships modernized in 1985-89 are same as replacements in 2010-2014.
2. Requirements for G&G ships may be met by new Class II ships.
3. Polar R/V requirement may be met by new procurement in other elements of Federal Oceanographic Fleet.

Proposed Navy Support (POM-87)

It is proposed that Navy fund new construction of three Class II ships in POM-87 as follows:

	Fund	I O C	Est. Cost
High Performance AGOR	FY-87	FY-91	$35M
High Endurance AGOR	FY-88	FY-92	$30M
Medium Endurance AGOR	FY-89	FY-93	$25M
Modernize two AGOR's	FY-87		

1 Oct. 1984

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

SCIENTIFIC MISSION REQUIREMENTS FOR LARGE HIGH ENDURANCE GENERAL PURPOSE OCEANOGRAPHIC RESEARCH SHIP

General: The ship is to serve as a large general purpose oceanographic research ship. The primary requirement is for a high endurance vessel capable of world wide cruising (except in close pack ice) and able to provide both overside and laboratory work to proceed in greater capacity and in higher sea states than is now available. Other general requirements are larger scientific parties, reliability, flexibility, cleanliness, vibration and noise free, and an overall upgrading of quality for doing science and engineering at sea.

Size: The size ultimately is determined by the requirements. It seems likely that these will result in a vessel larger than present academic ships. However, the LOA should not exceed 300 feet.

Endurance: Sixty days; providing the ability to transit to the most remote area and work 3 - 4 weeks on station.

Accommodations: 25 - 30 scientific personnel in two-person staterooms. Expandable to 40 through the use of vans. Science library-lounge with conference capability. Science office.

Speed: 15 knots cruising; sustainable in Sea State 5. Fine speed control throughout this range especially between 0 - 6 knots.

Station Keeping: Maintain station and work in Sea States up to 5; limited work in SS 7. Dynamic positioning in depths to 6,000 m, 35-knot winds, and SS 5.

Ice Strengthening: Ability to transit loose pack (5/10 cover). Not intended for icebreaking or close pack work. Protection against encounters with growlers and other glacial ice difficult to detect.

Deck Working Area: Spacious fantail area - 3,000 sq. ft. minimum with contiguous waist work area along one side 12 x 50 ft. minimum. Provide for deck loading up to 1,500 lbs./sq. ft. and an aggregate total of 100 tons.

Oversize holddowns on 2-ft. centers. Highly flexible to accommodate large and heavy equipment. Removable bulwarks. Dry deck but not greater than 7 - 10 ft. above waterline.

Usable clear foredeck area to accommodate specialized towers and booms extending beyond bow wave.

All working decks accessible for power, water, air, and data and voice communication ports.

areas and offload vans and heavy equipment up to 20,000 lbs.; (2) articulated to work close to deck and water surface; (3) to handle overside loads up to 5,000 lbs., 30 ft. from side and up to 10,000 lbs. closer to side; (4) overside cranes to have servo controls and motion compensation; (5) usable as overside cable fairleads at sea.

Ship capable of carrying portable cranes for specialized purposes.

Winches: New generation of oceanographic winch systems providing fine control (0.5 m/min); constant tensioning and constant parameter. Wire monitoring systems with inputs to laboratory panels and shipboard recording systems. Local and remote controls.

Permanently installed general purpose winches include:

- Two winches capable of handling 30,000 ft. of wire rope or electromechanical cables having diameters from 1/4" to 3/8".

- A winch complex capable of handling 40,000 ft. of 9/16" trawling or coring wire and 30,000 ft. of 0.68" electromechanical cable (up to 10 KVA power transmission and fibreoptics). This could be two separate winches or one winch with two storage drums.

Additional special purpose winches may be installed temporarily at various locations along working decks. Winch sizes may range up to 40 tons (140 sq. ft.) and have power demands to 300 h.p.

Portable shelters available to winch work areas for instrument adjustments and repairs. Winch control station(s) located for optimum operator visibility with reliable communications to laboratories and ship control stations.

Overside Handling: Various frames and other handling gear and more versatile than present to accommodate wire, cable and free launched arrays. Matched to work with winch and crane locations but able to be relocated as necessary.

Stern A-frame to have 20-ft. minimum horizontal and 30-ft. vertical clearance; 15-ft. inboard and outboard reaches.

Articulated stern ramp, 20-ft. minimum width, providing variable configurations ranging from a flush deck to a waterline platform.

Provision to carry additional overside handling rigs along working decks from bow to stern.

Control station(s) to give operator protection and operations monitoring and be located to provide maximum visibility of

overside work.

Laboratories: Approximately 4,000 sq. ft. of laboratory space including: Main Lab area (2,000 sq. ft.) flexible for frequent subdivision providing smaller specialized labs; Hydro lab (300 sq. ft.) and Wet lab (400 sq. ft.) both located contiguous to sampling areas; Bio-Chem Analytical lab (300 sq. ft.); Electronics/Computer lab and associated users space (600 sq. ft.); Darkroom (150 sq. ft); climate controlled chamber (100 sq. ft.), and freezer (100 sq. ft.).

Labs should be located so that none serve as general passageways. Access between labs should be convenient. Labs, offices, and storage to be served by a man-rated elevator having clear inside dimensions of approximately 3 ft. by 4 ft.

Labs to be fabricated using uncontaminated and "clean" materials and constsructed to be maintained as such. Furnishings, HVAC, doors, hatches, cable runs, and fittings to be planned for maximum lab cleanliness.

Fume hoods to be installed permanently in Wet lab and Analytical lab. Main lab shall have provision for temporary installation of fume hoods.

Cabinetry shall be high grade laboratory quality including flexibility through the use of unistruts and deck boltdowns.

Heating, ventilation, and air conditioning (HVAC) appropriate to laboratories, vans, and other science spaces being served. Laboratories shall maintain temperature of 70-75 degrees F.; 50% relative humidity and 9 - 11 air changes per hour. Filtered air provided to Analytical lab. Each lab area to have a separate electrical circuit on a clean bus with continuous delivery capability of at least 40-volt amperes per square foot of lab deck area. Labs to be furnished with 110 v and 220 v AC. Total estimated laboratory power demand is 100 KVA. Uncontaminated sea water supply to most laboratories, vans, and several key deck areas. Compressed air supply to be clean and oil free.

Vans: To carry four standardized 8 ft. by 20 ft. portable vans which may be laboratory, berthing, storage, or other specialized use. Hookup provision for power, HVAC, fresh water uncontaminated sea water, compressed air, drains, communications, data and shipboard monitoring systems. Van access direct to ship interior.

Provision to carry up to four additional portable non-standard vans (600 sq. ft. total) on superstructure and working decks. Supporting connections at several locations around ship including foredeck.

Ship should be capable of loading and offloading vans using own cranes.

Workboats:	At least one and preferably two 16-ft. inflatable (or semi-rigid) boats located for ease of launching and recovery.
	A scientific work boat 25 - 30 ft. LOA specially fitted out for supplemental operations at sea including collecting, instrumentation, and wide angle signal measurements. 12-hour endurance including both manned accommodations and automated operation. "Clean" construction. To be carried as a one of four-van options above.
Science Storage:	Total of 20,000 cubic ft. of scientific storage accessible to labs by elevator and weatherdeck hatch(es). Half to include suitable shelving, racks, and tie downs; remainder open hold.
Acoustical Systems:	Ship to be as acoustically quiet as practicable in the choice of all shipboard systems and their location and installation. Design target is underway echo sounding at 15 knots at Sea State 5.
	Ship to have 12 kHz, 3.5 kHz echo sounding systems and provision for additional systems.
	Phased array, multibeam precision echo sounding system (Sea Beam).
	Transducers appropriate to dynamic positioning system.
	Transducer wells (20") one located forward and two athwartships aft. Large pressurized sea chest (4 ft. x 8 ft.) to be located at optimum acoustic location for at-sea installation and servicing of transducers and transponders.
Multi-Channel Seismics:	Temporarily install and carry large array MCS system comprising two large capacity air compressors; streamer reel (10-ft. high, 15-ft. wide, 20-ton weight); rigging and booms to tow arrays with 100-meter separation; and up to four vans (600 sq. ft.) well aft in close proximity to towed arrays.
Navigation/ Positioning:	Global Positioning System (GPS) with appropriate interfaces to data systems and ship control processors.
	Short baseline acoustic navigation system.
	Dynamic Positioning System with both absolute and relative positioning parameters.
Internal Communications:	Internal communication system providing high quality voice communications throughout all science spaces and working areas.
	Data transmission, monitoring, and recording system available throughout science spaces including vans and key working areas.

Closed circuit television monitoring and recording of all working areas including subsurface performance of equipment and its handling.

Monitors for all ship control, environmental parameters, science and overside equipment performance to be available in all, or most, science spaces.

Exterior Communications:

Reliable voice channels for continuous communications to shore stations (including home laboratories), other ships, boats, and aircraft. This includes satellite, VHF and UHF.

Facsimile communications to transmit high speed graphics and hard copy text on regular schedules.

High speed data communications (9600 Baud) links to shore labs and other ships on a continuous basis.

Ship Control:

Chief requirement is maximum visibility of deck work areas during science operations and especially during deployment and retrieval of equipment. This would envision a bridge-pilot house very nearly amidships and with unobstructed stern visibility.

The functions, communications, and layout of the ship control station should be carefully designed to enhance the interaction of ship and science operations. For example, ship course, speed, attitude, and positioning will often be integrated with scientific operations requiring control to be exercised from a laboratory area.

APPENDIX VI-10

Oct.1, 1984

SCIENTIFIC MISSION REQUIREMENTS FOR MEDIUM ENDURANCE GENERAL PURPOSE OCEANOGRAPHIC RESEARCH SHIP

General: The ship is to serve as a medium to large general purpose research ship. The primary requirement is a maximum capability comensurate with ship size to support science and engneering operations at sea in terms of overside equipment handling, laboratory qualities, and a clean vibration free and stable environment for precision measurements.

Size: The size ultimately is determined by the requirements. However it is intended that this is a class ship to be a direct replacement of the current large university research ships such as the AGOR-3 Class (210 ft. LOA)

Endurance: Fifty days; providing the ability to transit 24 days at cruising speed and 24 days station work (6 knots), 12,000 mile total range.

Accommodations: 20 - 25 scientific personnel in two-person staterooms. Expandable to 30 through the use of vans. Science library-lounge with conference capability. Science office.

Speed: 14 knots cruising; sustainable in Sea State 5. Speed control plus/minus 0.1 knot in 0-6 knot range; and plus/minus 0.2 knot in range 6-14 knots.

Seakeeping: Maintain science operations in following speeds and sea states:

14 knots cruising in Sea State 5
8 knots cruising in Sea State 6
6 knots cruising in Sea State 7

Station Keeping: Maintain station and work in Sea States up to 5; limited work in SS 6.

Dynamic positioning both relative and absolute in 35 knot wind, Sea State 5, and 3-knot current in depths to 6,000 m using GPS and bottom transponders. Plus/minus 5 degrees heading; plus/minus 150 ft. max. excursion.

Ice Strengthening: Ability to transit loose pack (3/10 cover). Not intended for icebreaking or close pack work.

Deck Working Area: Spacious fantail area - 2,000 sq. ft. minimum with contiguous waist work area along one side 12 x 40 ft. minimum. Provide for deck loading up to 1,200 lbs./sq. ft. and an aggregate total of 90 tons.

Oversize holddowns on 2-ft. centers. Highly flexible to

accommodate large and heavy equipment. Removable bulwarks. Dry deck but not greater than 6 - 8 ft. above waterline.

Usable clear foredeck area to accommodate specialized towers and booms extending beyond bow wave.

All working decks accessible for power, water, air, and data and voice communication ports.

Cranes: A suite of modern cranes to handle heavier and larger equipment than at present: (1) to reach all working deck areas and offload vans and heavy equipment up to 20,000 lbs.; (2) articulated to work close to deck and water surface; (3) to handle overside loads up to 5,000 lbs., 30 ft. from side and up to 10,000 lbs. closer to side; (4) overside cranes to have servo controls and motion compensation; (5) usable as overside cable fairleads at sea.

Ship capable of carrying portable cranes for specialized purposes.

Winches: New generation of oceanographic winch systems providing fine control (0.5 m/min); constant tensioning and constant parameter. Wire monitoring systems with inputs to laboratory panels and shipboard recording systems. Local and remote controls.

Permanently installed general purpose winches include:

- Two winches capable of handling 30,000 ft. of wire rope or electromechanical cables having diameters from 1/4" to 3/8".

- A winch complex capable of handling 40,000 ft. of 9/16" trawling or coring wire and 30,000 ft. of 0.68" electromechanical cable (up to 10 KVA power transmission and fibreoptics). This could be two separate winches or one winch with two storage drums.

Additional special purpose winches may be installed temporarily at various locations along working decks. Winch sizes may range up to 40 tons (140 sq. ft.) and have power demands to 300 h.p.

Winch control station(s) located for optimum operator visibility with reliable communications to laboratories and ship control stations.

Overside Handling: Various frames and other handling gear to accommodate wire, cable and free launched arrays. Matched to work with winch and crane locations but able to be relocated as necessary.

Stern A-frame to have 15-ft. minimum horizontal and 25-ft. vertical clearance; 12-ft. inboard and outboard reaches.

Articulated stern ramp, 15-ft. minimum width, providing variable configurations ranging from a flush deck to a water-line platform.

Provision to carry additional overside handling rigs along working decks from bow to stern.

Control station(s) to give operator protection and operations monitoring and be located to provide maximum visibility of overside work.

Laboratories: Approximately 3,000 sq. ft. of laboratory space including: Main Lab area (1,500 sq. ft.) flexible for frequent subdivision providing smaller specialized labs; Hydro lab (250 sq. ft.) and Wet lab (300 sq. ft.) both located contiguous to sampling areas; Bio-Chem Analytical lab (250 sq. ft.); Electronics/Computer lab and associated users space (500 sq. ft.); climate controlled chamber (100 sq. ft.), and freezer (100 sq. ft.).

Labs should be located so that none serve as general passageways. Access between labs should be convenient.

Labs to be fabricated using uncontaminated and "clean" materials and constsructed to be maintained as such. Furnishings, HVAC, doors, hatches, cable runs, and fittings to be planned for maximum lab cleanliness.

Fume hoods to be installed permanently in Wet lab and Analytical lab. Main lab shall have provision for temporary installation of fume hoods.

Cabinetry shall be high grade laboratory quality including flexibility through the use of unistruts and deck boltdowns.

Heating, ventilation, and air conditioning (HVAC) appropriate to laboratories, vans, and other science spaces being served. Laboratories shall maintain temperature of 70-75 degrees F.; 50% relative humidity and 9 - 11 air changes per hour. Filtered air provided to Analytical lab. Each lab area to have a separate electrical circuit on a clean bus with continuous delivery capability of at least 40-volt amperes per square foot of lab deck area. Labs to be furnished with 110 v and 220 v AC. Total estimated laboratory power demand is 75 KVA. Uncontaminated sea water supply to most laboratories, vans, and several key deck areas. Compressed air supply to be clean and oil free.

Vans: To carry two standardized 8 ft. by 20 ft. portable vans which may be laboratory, berthing, storage, or other specialized use. Hookup provision for power, HVAC, fresh water uncontaminated sea water, compressed air, drains, communications, data and shipboard monitoring systems. Van access direct to ship interior.

Provision to carry up to three additional portable non-standard vans (500 sq. ft. total) on superstructure and working decks. Supporting connections at several locations around ship including foredeck.

Ship should be capable of loading and offloading vans using own cranes.

Workboats: At least one and preferably two 16-ft. inflatable (or semi-rigid) boats located for ease of launching and recovery.

A scientific work boat 25 - 30 ft. LOA specially fitted out for supplemental operations at sea including collecting, instrumentation, and wide angle signal measurements. 12-hour endurance including both manned accommodations and automated operation. "Clean" construction. To be carried as a one of two-van options above.

Science Storage: Total of 15,000 cubic ft. of scientific storage accessible to labs by interior and weatherdeck hatch(es). Half to include suitable shelving, racks, and tie downs; remainder open hold.

Acoustical Systems: Ship to be as acoustically quiet as practicable in the choice of all shipboard systems and their location and installation. Design target is underway echo sounding at 14 knots at Sea State 5.

Ship to have 12 kHz, 3.5 kHz echo sounding systems and provision for additional systems.

Phased array, multibeam precision echo sounding system (Sea Beam).

Transducers appropriate to dynamic positioning system.

Transducer wells (20") one located forward and one aft. Large pressurized sea chest (4 ft. x 8 ft.) to be located at optimum acoustic location for at-sea installation and servicing of transducers and transponders.

Multi-Channel Seismics: Temporarily install and carry large array MCS system comprising two large capacity air compressors; streamer reel (10-ft. high, 15-ft. wide, 20-ton weight); rigging and booms to tow arrays with 100-meter separation; and up to three vans (500 sq. ft.) well aft in close proximity to towed arrays.

Navigation/ Positioning: Global Positioning System (GPS) with appropriate interfaces to data systems and ship control processors.

Short baseline acoustic navigation system.

Dynamic Positioning System with both absolute and relative positioning parameters.

Internal Communications:	Internal communication system providing high quality voice communications throughout all science spaces and working areas.
	Data transmission, monitoring, and recording system available throughout science spaces including vans and key working areas.
	Closed circuit television monitoring and recording of all working areas including subsurface performance of equipment and its handling.
	Monitors for all ship control, environmental parameters, science and overside equipment performance to be available in all, or most, science spaces.
Exterior Communications:	Reliable voice channels for continuous communications to shore stations (including home laboratories), other ships, boats, and aircraft. This includes satellite, VHF and UHF.
	Facsimile communications to transmit high speed graphics and hard copy text on regular schedules.
	High speed data communications (9600 Baud) links to shore labs and other ships on a continuous basis.
Ship Control:	Chief requirement is maximum visibility of deck work areas during science operations and especially during deployment and retrieval of equipment. This would envision a bridge-pilot house very nearly amidships and with unobstructed stern visibility.
	The functions, communications, and layout of the ship control station should be carefully designed to enhance the interaction of ship and science operations. For example, ship course, speed, attitude, and positioning will often be integrated with scientific operations requiring control to be exercised from a laboratory area.

1 Oct. 198[illegible]

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

SCIENTIFIC MISSION REQUIREMENTS FOR LARGE HIGH PERFORMANCE GENERAL PURPOSE OCEANOGRAPHIC RESEARCH SHIP

General: The ship is to serve as a large general purpose research ship. The most overriding required characteristic is that the ship provide the most stable environment possible in order to allow both overside and laboratory work to proceed in greater capacity and in higher sea states than is now possible. Other general requirements are larger scientific parties, reliability, flexibility, cleanliness, vibration and noise free, and an overall upgrading of quality for doing science and engineering at sea.

Size: The size ultimately is determined by the requirements.

Endurance: Forty-five days; providing the ability to transit 20 days at cruising speed and 20 days station work (6 knots). 10,000 mile total range.

Accommodations: 25 - 30 scientific personnel in two-person staterooms. Expandable to 35-40 through the use of vans. Science library-lounge with conference capability. Science office.

Speed: 15 knots cruising; sustainable in Sea State 6. Speed control plus/minus 0.1 knot in 0-8 knot range; and plus/minus 0.2 knot in range 9-15 knots.

Seakeeping: To provide exceptionally stable seakeeping capabilities. Design targets for at rest condition in the following sea states are:

	Sea State (Sig. Wave Height) SS-4 (6.9 ft.)	SS-5 (12 ft.)
Pitch (ampl)	2.0 degrees	3.0 degrees
Roll (ampl)	2.5 degrees	4.0 degrees
Heave (ampl)	1.7 ft.	3.0 ft.
Vert. Accel.	0.06 g	0.09 g
Horiz. Accel.	0.06 g	0.11 g

Station Keeping: Maintain station and work in Sea States up to 6; limited work in SS 7. Dynamic positioning in depths to 6,000 m, 35-knot winds, and SS 6.

Ice Strengthening: None. Not intended for icebreaking or work in pack ice.

Deck Working Area:

Spacious; 4,000 sq. ft. minimum with work areas along all sides; bow and stern; and center well.

Provide for deck loading up to 1,500 lbs./sq. ft. and an aggregate total of 100 tons.

Oversize holddowns on 2-ft. centers. Highly flexible to accommodate large and heavy equipment. Removable bulwarks and/or railings.

All working decks accessible for power, water, air, and data and voice communication ports.

Centerwell: Approximately 15′ x 30′ center well accessible from working deck and interior deck.

Cranes: A suite of modern cranes to handle heavier and larger equipment than at present: (1) to reach all working deck areas and offload vans and heavy equipment up to 20,000 lbs.; (2) articulated to work close to deck and water surface; (3) to handle overside loads up to 5,000 lbs., 30 ft. from side and up to 10,000 lbs. closer to side; (4) overside cranes to have servo controls and motion compensation; (5) usable as overside cable fairleads at sea.

Ship capable of carrying portable cranes for specialized purposes.

Winches: New generation of oceanographic winch systems providing fine control (0.5 m/min); constant tensioning and constant parameter. Wire monitoring systems with inputs to laboratory panels and shipboard recording systems. Local and remote controls.

Permanently installed general purpose winches include:

- Two winches capable of handling 30,000 ft. of wire rope or electromechanical cables having diameters from 1/4" to 3/8".

- A winch complex capable of handling 40,000 ft. of 9/16" trawling or coring wire and 30,000 ft. of 0.68" electromechanical cable (up to 10 KVA power transmission and fibreoptics). This could be two separate winches or one winch with two storage drums.

Additional special purpose winches may be installed temporarily at various locations along working decks. Winch sizes may range up to 40 tons (140 sq. ft.) and have power demands to 300 h.p.

Portable shelters available to winch work areas for instrument adjustments and repairs. Winch control station(s) located for optimum operator visibility with reliable communications to laboratories and ship control stations.

Overside Handling:

Various frames and other handling gear to accommodate wire, cable and free launched arrays. Matched to work with winch and crane locations but able to be relocated as necessary.

Stern A-frame to have 20-ft. minimum horizontal and 30-ft. vertical clearance; 15-ft. inboard and outboard reaches.

Articulated stern ramp, 20-ft. minimum width, providing variable configurations ranging from a flush deck to a water-line platform.

Provision to carry additional overside handling rigs along working decks from bow to stern.

Control station(s) to give operator protection and operations monitoring and be located to provide maximum visibility of overside work.

Laboratories:

Approximately 4,000 sq. ft. of laboratory space including: Main Lab area (2,000 sq. ft.) flexible for frequent subdivision providing smaller specialized labs; Hydro lab (300 sq. ft.) and Wet lab (400 sq. ft.) both located contiguous to sampling areas; Bio-Chem Analytical lab (300 sq. ft.); Electronics/Computer lab and associated users space (600 sq. ft.); Darkroom (150 sq. ft); climate controlled chamber (100 sq. ft.), and freezer (100 sq. ft.).

Labs should be located so that none serve as general passageways. Access between labs should be convenient. Labs, offices, and storage to be served by a man-rated elevator having clear inside dimensions of approximately 3 ft. by 4 ft.

Labs to be fabricated using uncontaminated and "clean" materials and constsructed to be maintained as such. Furnishings, HVAC, doors, hatches, cable runs, and fittings to be planned for maximum lab cleanliness.

Fume hoods to be installed permanently in Wet lab and Analytical lab. Main lab shall have provision for temporary installation of fume hoods.

Cabinetry shall be high grade laboratory quality including flexibility through the use of unistruts and deck boltdowns.

Heating, ventilation, and air conditioning (HVAC) appropriate to laboratories, vans, and other science spaces being served. Laboratories shall maintain temperature of 70-75 degrees F.; 50% relative humidity and 9 - 11 air changes per hour. Filtered air provided to Analytical lab. Each lab area to have a separate electrical circuit on a clean bus with continuous delivery capability of at least 40-volt amperes per square foot of lab deck area. Labs to be furnished with 110 v and 220 v AC. Total estimated laboratory power demand is 100 KVA. Uncontaminated sea water supply to most laboratories, vans,

and several key deck areas. Compressed air supply to be clean and oil free.

Vans: To carry four standardized 8 ft. by 20 ft. portable vans which may be laboratory, berthing, storage, or other specialized use. Hookup provision for power, HVAC, fresh water uncontaminated sea water, compressed air, drains, communications, data and shipboard monitoring systems. Van access direct to ship interior.

Provision to carry up to four additional portable non-standard vans (600 sq. ft. total) on superstructure and working decks. Supporting connections at several locations around ship including foredeck.

Ship should be capable of loading and offloading vans using own cranes.

Workboats: At least one and preferably two 16-ft. inflatable (or semi-rigid) boats located for ease of launching and recovery.

A scientific work boat 25 - 30 ft. LOA specially fitted out for supplemental operations at sea including collecting, instrumentation, and wide angle signal measurements. 12-hour endurance including both manned accommodations and automated operation. "Clean" construction. To be carried as a one of four-van options above.

Science Storage: Total of 20,000 cubic ft. of scientific storage accessible to labs by elevator and weatherdeck hatch(es). Half to include suitable shelving, racks, and tie downs; remainder open hold.

Acoustical Systems: Ship to be as acoustically quiet as practicable in the choice of all shipboard systems and their location and installation. Design target is underway echo sounding at 15 knots at Sea State 5.

Ship to have 12 kHz, 3.5 kHz echo sounding systems and provision for additional systems.

Phased array, multibeam precision echo sounding system (Sea Beam).

Transducers appropriate to dynamic positioning system.

Transducer wells (20") located forward and aft. Large pressurized sea chest (4 ft. x 8 ft.) to be located at optimum acoustic location for at-sea installation and servicing of transducers and transponders.

Multi-Channel Seismics: Temporarily install and carry large array MCS system comprising two large capacity air compressors; streamer reel (10-ft. high, 15-ft. wide, 20-ton weight); rigging and booms to tow arrays with 100-meter separation; and up to four vans (600 sq. ft.) well aft in close proximity to towed arrays.

Navigation/ Positioning:	Global Positioning System (GPS) with appropriate interfaces to data systems and ship control processors.
	Short baseline acoustic navigation system.
	Dynamic Positioning System with both absolute and relative positioning parameters.
Internal Communi- cations:	Internal communication system providing high quality voice communications throughout all science spaces and working areas.
	Data transmission, monitoring, and recording system available throughout science spaces including vans and key working areas.
	Closed circuit television monitoring and recording of all working areas including subsurface performance of equipment and its handling.
	Monitors for all ship control, environmental parameters, science and overside equipment performance to be available in all, or most, science spaces.
Exterior Communi- cations:	Reliable voice channels for continuous communications to shore stations (including home laboratories), other ships, boats, and aircraft. This includes satellite, VHF and UHF.
	Facsimile communications to transmit high speed graphics and hard copy text on regular schedules.
	High speed data communications (9600 Baud) links to shore labs and other ships on a continuous basis.
Ship Control:	Chief requirement is maximum visibility of deck work areas during science operations and especially during deployment and retrieval of equipment. This would envision a bridge-pilot house with unobstructed stern visibility.
	The functions, communications, and layout of the ship control station should be carefully designed to enhance the interaction of ship and science operations. For example, ship course, speed, attitude, and positioning will often be integrated with scientific operations requiring control to be exercised from a laboratory area.

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

EAST COAST SHIP SCHEDULING GROUP
WEST COAST SHIP SCHEDULING GROUP
REPORT OF JOINT MEETING
OCTOBER 25, 1984

The East and West Coast Regional Ship Scheduling Group met separately and jointly at the National Science Foundation, 1800 G Street N.W., Washington, D.C. on May 23, 1984.

Individual meetings for the two groups were called to order at 9:00 a.m. by Robertson P. Dinsmore (East) and Brian Lewis (West).

Review and updates of 1984 ship schedules, operations, costs and agency support were quickly made. The reviews revealed that total operating days had decreased less than 3% to 4,982 days. This use is approximately 11% more than the actual 4,494 days used in 1983. Associated cost increase is 10%. As can be seen in the Profile of Funding Cycles, 1984 Operations, estimates for 1984 costs have converged with funding anticipated to be available for 1984 operations. Schedules of both the KNORR and the MELVILLE were curtailed due to unanticipated repair periods. Ship schedules for 1984 are being updated on the UNOLS Ship Schedule Bulletin Board *Ship.Sched84*.

The ELLEN B. SCRIPPS has been replaced by the ROBERT G. SPROUL, and the KANA KEOKI has been replaced by the MOANA WAVE.

PROFILE OF FUNDING CYCLES
$MILLION

	OP DAYS	NSF	ONR	OTHER	TOTAL	SHORT FALL
1982	4399	21.2	3.4	4.8	29.4	----
1983	4494	23.4	3.9	5.3	32.6	----
		1984 OPERATIONS				
May '83 Projection	6,016	28.7	4.4	6.4	39.5	
(Anticipated)		(25.4)	(4.1)	(6.4)	(35.9)	($0.4)
Oct. '83 Projection	5,892	27.4	5.0	8.3	40.7	
(Anticipated)		(25.0)	(4.5)	(8.0)	(37.5)	($3.2)
Feb., Mar., '84 Projection	5,435	25.5	4.8	7.9	38.2	
(Anticipated)		(24.3)	(4.8)	(7.2)	(36.2)	($2.0)
May '84 Projection	5,210	24.7	4.8	7.2	36.7	
(Anticipated)		(24.3)	(4.8)	(7.2)	(36.2)	($0.4)
Oct. '84 Projection	4,982	24.2	4.3	7.3	35.8	
(Anticipated)		(24.2)	(4.3)	(7.3)	(35.8)	---

Ship schedules, operations, costs and agency support for 1985 were next projected by individual institutions, discussed and summarized.

Schedule updates can be reviewed on the UNOLS ship schedule bulletin board *Ship.Sched85*. Operations, costs and funding summaries are in the tables Summary of 1985 Cost Projections.

Projections are for 5,213 days ship operations, an increase of 231 days (about 5%) over use estimated for 1984. Costs are estimated to increase by about 3%. Despite relatively stable total costs, a shortfall of approximately $3.4M is projected. One factor is that funding anticipated from other than NSF and ONR has decreased from $7.3M in 1984 to $4.2 in 1985.

Although almost all of the ship use projected for 1985 is solidly funded thus lending stability to schedules, there are some soft spots and uncertainties:

The KNORR is the only large ship scheduled in the North Atlantic, and is presently scheduled for only 188 days. The ship could be laid up for up to 3 months in early 1985 or could do some work in the South Atlantic.

One University of Miami ship does not have a full schedule. (In the tables within this report. No 1985 projection is made for the CAPE FLORIDA.)

Some Division of Polar Programs work in the South Atlantic has not been scheduled within the fleet.

According to present schedules the ATLANTIS II (with ALVIN), CONRAD, MOANA WAVE, THOMPSON and WASHINGTON would all end 1985 in the Western Pacific. For that and other reasons some projects may be moved among these ships and schedules may still be revised.

EAST-WEST SCHEDULING MEETING
October 25, 1984

Summary of 1985 Cost Projections

Projections made October 25, 1984

$Million

	OP DAYS	NSF	ONR	OTHER	TOTAL
EAST	2,758	14.782	2.354	2.442	19.578
WEST	2,455	13.610	1.835	1.765	17.223
TOTAL	5,213	28.392	4.189	4.207	36.791
ANTICIPATED	-	25.0	4.2	4.2	33.4
PROJECTED SHORTFALL	-	3.392	-	-	$3.392
Similar Projections, May 23, 1984					
EAST	3,435	15.894	3.094	5.215	24.203
WEST	2,564	15.098	1.785	1.373	18.257
TOTAL	5,999	30.992	4.879	6.588	42.460
Similar Projections, February, March, 1984					
EAST	3,268	13.926	2.987	6.482	23.395
WEST	2,621	14.776	2.422	1.137	18.336
TOTAL	5,889	28.702	5.409	7.619	41.731

1985 COST PROJECTIONS

SHIP	1984 $ NSF	1984 $ TOTAL	1984 OP DAYS	PROJECTED 1985 COSTS: 1985 OP DAYS	NSF $K	ONR $K	OTHER $K	TOTAL $K
ATLANTIS II	2385	3177	321	293	2732	243	265	3,241
KNORR	2037	2832	205	188	1175	1175	-	2,350
CONRAD	2191	2861	310	315	2861	541	Indus 312	3,263
OCEANUS	657	1480	250	257	1332	62	MMS 388	1,782
ENDEAVOR	883	1457	237	235	1169	161	MMS 315	1,645
GYRE	1099	1869	272	281	1343	70	USGS 438 TAMU 104	1,955
ISELIN	1203	1537	236	240	1400	-	MMS 100 USGS 100	1,600
CAPE HENLOPEN	292	748	157	187	622	59	MMS 157 NOAA 78	916
CAPE HATTERAS	1137	1374	250	250	1083	-	MMS 103 NC 57 DOE 182	1,425
CAPE FLORIDA	848	1158	222					
WARFIELD	545	545	146	157	535	-	NOAA 32	567
BLUE FIN	131	198	166	170	124	-	DOE 47	172
LONGHORN	-	-	-	-	-	-	-	-
CALANUS	162	185	92	132	158	43	NOAA 36	237
MOORE	-	536	68	53	248	-	Indus 96 State 81	425
TOTALS	13,570	20,120	2,932	2,758	14,782	2,354	2,442	19,578

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1985 COST PROJECTIONS

SHIP	1983 COSTS	1984 COSTS (Proposed)	1984 OP DAYS	PROJECTED 1985 COSTS: 1985 OP DAYS	NSF	ONR	OTHER	TOTAL
MELVILLE	3181	2781	200	249	2723	0	Sandia 194	3,000
WASHINGTON	1837	3110	293	259	1839	1156		2,995
NEW HORIZON	1406	1855	254	207	987	70	UC 396 DOE 155	1,608
R. G. SPROUL	437	415	130 42	159	356	65	UC 90 DOE 61	572
VELERO IV	565	608	93	205	862	-		862
CAYUSE	488	396	85	136	287	37	MLML 85 local Gov 51	460
WECOMA	1832	1613	214	242	1683	151		1,834
THOMPSON	1616	2281	264	258	2115	354		2,469
BARNES/ HOH/ ONAR	171	135	118	199	141	2	17	160
ALPHA HELI	1397	1255	114	204	1500		Alaska 15	1,515
KANA KEOKI	1305	930	155	-	-	-		-
MOANA WAVE	-	318	53	337	1117*	0	AIDE 701	1,818
TOTALS	14,237	15,697	2,015	2,455	13,610	1,835	1,765	17,223

* includes 291K-J0I

1984 PROJECTIONS

SHIP	OP DAYS	NSF $K	ONR $K	OTHER $K	OTHER $K	TOTAL $K
MELVILLE	200	2475	0	DC 14 Sandia 292		2,781
WASHINGTON	293	1560	1412	UC 138		3,110
NEW HORIZON	254	241	343	UC 1117 DARPA 153		1,855
E. B. SCRIPPS R. G. SPROUL	123 39	205 59	46 3	20 44 38		315 100
VELERO IV	117	608	-			608
CAYUSE	85	233	-	Local 56 MLML 107		396
WECOMA	214	1546	37	30		1,613
THOMPSON	264	1823	458			2,281
BARNES ONR	98 41	89 34	0 0	10 2		99 36
ALPHA HELIX	114	1233	-	22		1,255
KANA KEOKI	155	420	126	384		930
MOANA WAVE	53	108	0	210		318*
TOTAL	2,050	10,634	2,425	2,637		15,697
EAST COAST	2,932	13,570	1,844	4,706		20,120
TOTAL	4,982	24,204	4,269	7,343		35,817

*rest of year MOANA WAVE on fixed price with Navy