UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

ADVISORY COUNCIL MEETING
Pigeon Key, Florida

Minutes of Meeting, February 2, 3, 1984

Advisory Council Members and representatives from the National Science Foundation, the Office of Naval Research and the U.S. Geological Survey conveyed at the Rosenstiel School of Marine and Atmospheric Science, University of Miami's Marine Biological Research Facility, Pigeon Key, Florida. The meeting was called to order by Chairman Charles Miller at 9:00 am on February 2.

Attendees

Advisory Council
Charles B. Miller, *Chairman*
Harris B. Stewart, Jr., *Vice-Chairman*
Robertson P. Dinsmore
Bruce Robison
John C. Van Leer
Ferris Webster, *ex-officio*

Observers
Keith Kaulum, ONR
R. R. La Count, NSF
Robert Rowland, USGS

UNOLS Office
William D. Barbee

Unable to Attend
Robert W. Corell
Roger Larson
Joseph Curray, *ex-officio*

The Minutes of the Advisory Council meeting of October 24, 1983, in Washington, D. C. were accepted.

Status reports were made on Council Member's Standing Roles.

William Barbee made a report on *Cruise Assessments* in Joe Curray's absence. Returns continue to be informative, and participation is improving. (That notwithstanding, a Summary of Cruise Assessments for July-September, 1983 was not presented to the Council for their approval. Not enough ships were covered in the returns received.) Bill Barbee reported that the UNOLS Office continues to receive queries from the investigator community either asking for information contained in the summaries or questioning the negative tone of the Cruise Assessment Form. Also Texas A and M University has suggested through RVOC that the form be modified to remove some time accounting information that chief scientists now must provide. The Advisory Council directed responses to various queries that would note that the Cruise Assessment Reports have not generally been negative in character, but have in many cases served to identify specific problems. This identification of problems has helped lead to timely solutions by operators and founding agencies.

A report on activities of the *Subcommittee on International Access for Ocean Research* was given by William Barbee for Robert Corell. The Subcommittee had not met since the last report. The UNOLS Office has informed the UNOLS Community that Mr. Tom Cocke is handling the process for foreign research permits at Department of State. UNOLS has also accepted a task to develop a handbook to guide application for research permits. Lee Stevens is drafting the handbook.

In Council discussion several suggestions were made that might aid in arranging oceanographic research in areas of claimed foreign jurisdiction. A list of foreign contacts might be helpful to speed up action on permits, to arrange for foreign observers and to arrange useful collaboration. It was noted that David Ross, Woods Hole Oceanographic Institution has a conceptual proposal on International Marine Science Cooperation that would provide such a listing along with other tasks in an Office for International Marine Science Cooperation. Dr. Ross will be invited to present his ideas to UNOLS at one of their 1984 meetings. An additional problem: there must be a clear understanding among agencies, investigators and ship operators about who will pay travel for foreign observers. Currently there is not an explicit policy.

Charles Miller reported on *Specialized Instrumentation Facilities*. There is interest in establishing an aircraft imagery program for the West Coast. (At present there is a program available for the East Coast, but none in the West.) Aside from this effort, that is being actively pursued by several investigators in collaboration, the oceanographic community has not been very responsive to the concept of expensive special instrumentation facilities to be justified and operated cooperatively among institutions. Lack of an identified source of funding may account for this apathy.

R. P. Dinsmore and Charles Miller reported on *Replacements, Additions and Refinement in the UNOLS fleet* and on the *UNOLS Committee on Fleet Replacement*.

The Council focused on two elements that would affect composition of the UNOLS fleet: efforts by individual UNOLS to modify or replace vessels that they operate, and efforts by the Committee on Fleet Replacement to evaluate, plan and recommend for orderly replacement on a fleet-wide basis.

The Council and the Fleet Replacement Committee have been advised of several actions by UNOLS that would affect fleet composition:

The University of Southern California continues their efforts to acquire a replacement for the VELERO IV. (See minutes of the October 24, 1983 Advisory Council meeting for earlier Council consideration of this effort.) By agreement with NSF/OFS, USC's efforts have been broadened to include assessment of tuna clippers of 150-190 ft length, and of oilwell supply vessels as well as the OSPREY (220 ft). Two questions dominate the OSPREY assessment. Can the OSPREY be made to conform to certification and documentation regulations by the Coast Guard? Will costs for conversion and operation be reasonable and justifiable? USC is keeping the Advisory Council informed, principally through R. Dinsmore's Committee.

Scripps Institution of Oceanography has undertaken efforts to replace the ELLEN B. SCRIPPS with a vessel to operate at comparable costs but with modestly better capabilities in order to fill regional ship requirements more-regional effectively (1 hour from G. Shor, Appendix I).

The Navy Postgraduate School is assessing replacement of the ACANIA late in 1984. It has been decided that the ACANIA will be retired, and recommendations are going forward to the Navy concerning replacement. It has not been decided how the ship will be replaced, so Navy Postgraduate School shiptime requirements for the UNOLS fleet cannot be estimated.

The University of Hawaii proposal to stretch the MOANA WAVE are proceeding, and the University estimate that the ship will be operational in the UNOLS fleet in October, 1984. The stretched MOANA WAVE will have capabilities comparable to UNOLS Class A and B ships, and will have considerable impact on fleet composition. The University of Hawaii is also considering retention of the KANA KEOKI (Appendix II).

Texas A and M University has plans for modifying the GYRE to increase deckspace aft.

The University of Texas has plans to replace the FRED H. MOORE through construction of a new ship, primarily for geological and geophysical research (Appendix III). This Class A or B ship would have advanced MCS and swath sounding capabilities.

A study has been started under FOFCC to define needs and characteristics of a vessel for polar research. Options considered include new construction, dedicating a Coast Guard icebreaker to polar research (e.g., GLACIER), or chartering to satisfy near term needs (i.e., to provide Antarctic support after this, the last year for the HERO). Norwegian vessels POLAR CIRCLE or POLAR QUEEN are under consideration. Although a vessel within any of these options would be a part of the Federally-operated fleet, it would have an impact on requirements for UNOLS ships. The 1977 Polar Research Vessel study and design by the University of Alaska for UNOLS has been made available to the present study group.

Meanwhile the UNOLS Fleet Replacement Committee proposes to conduct a study leading to a coordinated plan for the replacement of aging UNOLS Research Vessels, and the construction of new ships in order to implement the plan (Appendix IV).

The Advisory Council endorsed the replacement committee's approach and proposal, and recommended that the Fleet Replacement Committee should also develop specific recommendations to the funding agencies and the oceanographic community for mechanisms through which the ship replacements can be achieved.

At the Council's direction Chairman Miller will write George Shor, Jr., Scripps, Charles Helsley, University of Hawaii and Arthur E. Maxwell, University of Texas informing them of Council reactions concerning plans for an E.B. SCRIPPS replacement, retention of the KANA KEOKI and a FRED H. MOORE replacement (Appendix V).

Following discussion concerning fleet management, R. R. La Count, OFS/NSF noted that the National Science Foundation employs the peer review process as a fundamental part of its management and support of academic research. Edward Knapp, Director, NSF, in his December 1, 1983 remarks to the Council of Graduate Schools noted that this peer review process is under strain:

"At present, one aspect of the peer review system is under severe strain. Several major university science projects have been promoted through direct Congressional action without agency review or community endorsement. While this procedure may seem attractive at first glance, and while some university faculties are under extreme pressure, this kind of action in the long run will be extremely destructive to science as we know it.

Sometimes the peer review system is cumbersome, but its advantages far outweigh its disadvantages. Unless all of us remain vigilant, we may weaken one of the real strengths in this country's system of support for basic research."

Mr. La Count noted further that in its 1983 report the Subcommittee on Oversight Review of the Oceanographic Facilities Support Section (of the Advisory Committee to the Division of Ocean Sciences) stressed the importance of external (peer) review for major actions involving academic fleet. The Subcommittee report, in its overview of findings, stated:

"Hence, we recommend that all major actions involving the composition of the academic fleet be sent to the UNOLS Advisory Council for their recommendations."

The Subcommittee expanded that recommendation with a recommendation that NSF/OFS *establish new policy and guidelines concerning ship assignment and reassignment with substantial input from the ocean science community, through the UNOLS Advisory Council.* Further, the Subcommittee suggested *that formal review of proposed additions, replacements or other augmentations of the fleet by UNOLS would provide a consistent external review mechanism for all changes contemplated for the academic fleet.*

Mr. La Count stated that his Office is in essential agreement with the Oversight Subcommittee, recommendations, and asked for Advisory Council

response. The Council considered their responsibilities to review actions affecting the UNOLS fleet in the context of NSF peer review policies.

The Advisory Council, recognizing Edward Knapp's expression concerning the severe strain recently placed on the system reaffirms its support of the peer review process in the general consideration of scientific proposals.

In recognition of their traditional role, their recent activities in reviewing the UNOLS fleet and charges from NSF/OFS, *the Advisory Council accepted responsibility to review and provide recommendations on all major actions involving composition of the academic fleet. The Council's formal review of proposed additions, replacements or other augmentations of the fleet (in concert with relevant reviews by the UNOLS Committee on Fleet Replacement) will provide a consistent external review mechanism for all changes contemplated for the academic fleet.*

(Note that discussion and actions on peer review and review of changes to the UNOLS fleet were initiated during discussions of fleet management were readdressed during remarks from sponsoring agency representatives and were concluded under other business. Discussions are consolidated here for clarity.)

Harris B. Stewart, Jr. and Bruce Robison reported on *East Coast and West Coast Ship Scheduling Meetings* held in October, noting that the UNOLS scheduling process and these meetings are working effectively. Dates for February and March scheduling meetings were noted.

Mr. La Count described the workshops on ship operations, instrumentation and equipment proposals to be held at the spring scheduling meetings. OFS objections are to streamline proposals by eliminating some seldom used projections of costs and operations together with other unnecessary information. At the same time more information will be requested to described minor equipment requests, the nature of investigations to be supported and for other purposes to make proposals more useful. OFS will also examine recent trends in relative costs in ship operations and their impact on NSF facility budgets.

Bruce Robison discussed the Council's pending *reexamination of UNOLS fleet composition* and defined data and information that will be required.

Bob Dinsmore noted that the Federal Oceanogaphic Fleet Coordinating Council (FOFCC) report is still pending, but should be completed soon. The report will compare Federal agency ship time requirements with available research ship time. A significant conclusion is that the research fleet is aging and that plans and action to replace elements of the fleet are urgently required.

W. Barbee reported for Robert Corell that solicitations and the two workshops (December, 1983 in San Francisco and January, 1984 in New Orleans) had produced nearly 70 notices of intent to use either ALVIN or blue water ships in the UNOLS fleet. The workshops are successful mechanisms for ALVIN planning, less so for UNEPC.

John Van Leer noted that UNOLS consideration of *new platform design ideas* is entering a new more concrete phase. Letters in response to his report

(Appendix I, October, 1983 Advisory Council meeting) together with plans from the University of Texas and the UNOLS Committee on Fleet Replacement suggest that several new design ideas will be closely examined.

Donn Gorsline reported under *communications* that the first issue of UNOLS NEWS had been distributed in October, 1983 to over 500 addresses. Reaction to the newsletter has been favorable. More than 20 requests to be added to distribution have been received. Several UNOLS institutions reproduce UNOLS NEWS for distribution to their faculty and staff.

The second issue, to be distributed in late February, will include a message from the UNOLS Chairman, a report of the September RVOC meeting items from October UNOLS meetings, discussion of Cruise Assessment Reports, fleet replacement and information on the National Science Foundation budget for FY-1985. W. Barbee noted that the UNOLS Office has also enhanced communications by expanding distribution of UNOLS meeting reports, etc.

R. R. La Count reported on the *National Science Foundation budget submission* for FY-1985. The overall budget increases 13.6% over FY-1984. Details are shown in Appendix VI (and in UNOLS NEWS, Winter 1983-84).

The Class VII Advanced Vector Computer (AVC) to be acquired by NCAR (through Division of Atmospheric Sciences funding) will be available to oceanographic researchers, and will provide five times the speed and ten times the memory of NCAR's current computing facility.

Of the second group of 200 Presidential Young Investigator Awards made to help increase the attractiveness of academic careers and to help develop stronger ties between universities and industry, two are in oceanography.

Mr. La Count noted that from his office's perspective it was premature to discuss workshops on the nature of oceanographic science in the future and facilities needs to support that science; it is equally premature to discuss possible roles for UNOLS in organizing such workshops. However, the workshop on minicomputers and micro-processing to be held in June, 1984, organized in part through UNOLS might be pertinent to NSF's mid-range projections for oceanography.

Discussions on review of changes to the UNOLS fleet and policy and guidelines for ship assignment, reassignment are covered under fleet management (above).

Keith Kaulum, discussing *ONR activities* reported that as a part of preliminary Navy plans for research ship replacement, ONR is assembling preliminary justifications and outlining options for the Chief of Naval Research. Among others, options will include a joint effort with NSF and replacement as part of a Navy program. Current conditions are that the Navy owns seven of the largest UNOLS ships and uses about 15% of UNOLS ship time. This preliminary study should reach ONR within the next few months.

The need for polar research ship(s) is being assessed by the FOFCC Coordination Board. The need for the study has been advanced by NOAA, and assigned to FOFCC by the Committee on Atmosphere and Oceans (CAO). The study will examine research needs in the Federal government and needs for new

vessel(s) versus other solutions. The capability to conduct polar research will be distinguished from ice breaker capability (to support research). Mr. Kaulum together with John McMillan are initiating the study by polling agencies to determine their research requirements. Time frame for the study is 3-4 months.

Rennovation and stretch on the MOANA WAVE are proceeding in shipyard in Alabama.

The Navy is promoting scientific use of deep submersibles in two programs. The NR1 program includes a Science Committee that has solicited user requests from USGS, NSF, NOAA and Navy research organizations. Proposals will be ranked for this second year that NR1 is available for scientific investigations. (This year's schedule is all research.) Reviewers hope for higher quality proposals than have so far been received. The NR1 berths in New London, Connecticut, and is generally restricted to the Atlantic. Her main asset is tremendous submerged endurance, about 25 days. Research results can be published. Availability for research is expected to last into the 1990's.

The SEACLIFF has been modified for 20,000 ft. depth capability. (It is just coming out of shipyard.) It will be assigned to a Navy project, TRANSQUEST, for about 2 months. The Navy operators, SUBDEV Group 1 are taking over LULU to support SEACLIFF and TURTLE. They, too, are anxious to undertake scientific investigations.

ONR (and other agencies) are requesting a definitive achieving policy for the ALVIN program.

NOAA was not represented at the meeting. Information available on their FY-1985 budget indicates that the DISCOVERER and RESEARCHER would be fully operational, the SURVEYOR would be partly funded and the OCEANOGRAPHER would remain inactive.

Robert Rowland reported that the *outlook for USGS* is for substantial marine programs and significant ship use. The S. P. LEE (now being operated by the University of Hawaii for USGS) is now in McMurdoo Sound, and is solidly scheduled through FY-1985. The MOANA WAVE will also do work for USGS in 1985, and East Coast work should remain at recent levels.

The GS' Exclusive Economic Zone (EEZ) program was, in part, presented in a late-1983 symposium. The program promotes more cooperation between GS and NOAA, especially in mapping, and more government and industry cooperation. Arrangements are being made for the use of the SURVEYOR and DAVIDSON on West Coast surveys, and GS is very interested in using a VELERO IV replacement. GS has an offer for GLOMAR CHALLENGER, and ten to twelve oil companies may help fund a drilling program.

W. Barbee reported for Robert Corell for the *ALVIN Review Committee*. The ALVIN/ATLANTIS II sailed on February 1, 1984 to undertake the Atlantic Ocean portion of their 1984 schedule (projects for Flood, Newman and Curray). They will then proceed through the Panama Canal to take up Pacific Ocean projects. The ATLANTIS II's ALVIN support system is impressive, and the ARC together with W.H.O.I. operators expect an efficient, effective operating

season. The tentative schedule is for the most ambitious dive year yet attempted.

W. Barbee reported that RVOC has established a working group chaired by T. K. Treadwell, to *draft revised UNOLS Safety Standards*. A preliminary draft has been drawn and circulated, and with that draft and comments, Captain Treadwell held a meeting of the working group in January, 1984. The product of that meeting, *UNOLS Safety Standards, 1984 revision*, will be circulated to UNOLS institutions prior to the May Semiannual meeting so that it can be considered for acceptance by UNOLS Members.

W. Barbee reported on *UNOLS Office activities*. The Office has implemented the UNOLS Ship Schedule bulletin board on telemail. Schedules for 1984 for all ships are now available. Tentative schedules for 1985 will be added after West and East Coast scheduling meeting in February and March. All schedules will be updated as new information is received in the UNOLS Office.

The Advisory Council commended the UNOLS Office for implementing the schedule bulletin board as instructed.

The report on two joint UNEPC-ARC workshops for advanced planning (December, 1983 and January, 1984) will be mailed to over 500 addresses in early February. UNEPC received 33 notices of intent to use UNOLS ships in 1985-1987, and ARC received 39 notices for ALVIN dive projects.

Lee Stevens has been hired in the UNOLS Office to write a *Foreign Clearance Handbook*. The handbook will provide guidance on procedures for obtaining clearances to conduct research in marine jurisdictions of foreign states, and should be available in mid-1984.

The Office has greatly enhanced communications and information services during the year. UNOLS NEWS, announcements of workshops, reports on workshops and advanced planning for ship scheduling, etc. are routinely mailed to over 500 addresses. Reports on UNOLS, Advisory Council and committee meetings are mailed to 150-350 addresses.

UNOLS Charter revision and readoption were discussed. *The sense of the Advisory Council was that the Council's recommended revision defining UNOLS ships should be distributed to UNOLS membership without delay so that it can be considered for adoption at the May meeting. The entire Charter should also be distributed so that it can be considered for periodic re-adoption.*

The Council's recommended revision:

Add as paragraph (g) under Section 2:

UNOLS vessels are defined as those United States research vessels which are operated by UNOLS Member institutions and are significantly funded by the Federal government. They are operated in accordance with UNOLS performance and safety standards and are scheduled by established UNOLS procedures. Designation of UNOLS vessels if by vote of UNOLS Members, after review and recommendation by the Advisory Council.

UNOLS Chairman Ferris Webster led discussion of nominations for 1984. Nominations are required for UNOLS Chairman, Vice Chairman and three Advisory Council members (two from among Member institutions, one from among Associate Members). He had tentatively selected as nominating committee Harris B. Stewart, Jr., Old Dominion University, Chairman, Derek Spencer, W.H.O.I., and T. K. Treadwell, TAMU members. The Council agreed that such a committee represented balance among institutions represented, Member-Associate Member representation, research and operational interests and other factors.

Two *applications for UNOLS Membership or Associate Membership* were presented to the Advisory Council:

Moss Landing Marine Laboratories for Member
University of South Florida for Associate Member.

The Council approved both applications. They directed that both applications, together with previously recommended applications for Associate Membership from the Louisiana Universities Marine Consortium (LUMCON) and Navy Postgraduate School be circulated to UNOLS membership for action at the May UNOLS meeting.

The Council instructed that an inquiry on Associate Membership status from Harvard University be pursued.

The *schedule for Advisory Council meetings* was discussed. After the May 24 meeting in Washington, D.C. and the election of new AC members at the UNOLS meeting May 24, 25 a summer meeting should be set without delay. After considering invitations from Skidaway, University of Delaware, Oregon State/University of Washington and Woods Hole, the Council set a meeting for late June in Seattle. (After conflicts with a UNOLS-arranged workshop on microprocessors/minicomputers was resolved, the meeting was scheduled for June 28, 29, 1984 at the University of Washington, Seattle.)

Under *other business* it was determined to seek the principal speaker for the May UNOLS meeting from NSF. Ron La Count offered his offices to that end.

An inquiry concerning competition between UNOLS ships and commercially operated research vessels for research support in the commercial section (i.e., a letter to a Congressman) was introduced and discussed without action.

The meeting was adjourned at 12:10 p.m., February 3, 1984.

Scripps Institution of Oceanography
Ship Operations and Marine Technical Support
Mail Code A-010, La Jolla, CA 92093

January 25, 1984

UNOLS Committee on Fleet Replacement,
Capt. Bob Dinsmore, Chairman

Subj: Replacement of the R/V Ellen B. Scripps

This is to inform you officially of our plans to replace the R/V Ellen B. Scripps, as soon as practical, with a ship of slightly improved capabilities, and lesser age. The Ellen Scripps was built nearly 19 years ago; ships of its class were built with an expected working life of 10 to 20 years. In the current year, we have made conservative estimates of the work needed to make it usable for another 10 years, and came up with an estimate of $200,000. This seems to us to be an excessive sum to pay for what amounts to a midlife refit for a ship which has gradually become "too small, too rough riding, and too noisy" for much of the work that it did in the past. We frequently have an overload of work for the R/V New Horizon; when we try to shift some of these programs to the R/V Ellen Scripps, we find that few of them can be moved, mostly for the reasons given above. We have also noted that there is a "buyers market" for workboats at present, due to the slump in the oil industry. We have therefore asked users of the R/V Ellen Scripps (a group of seasoned seagoers) what they would like to see in a replacement ship. The answer, from past EBS users and some New Horizon users who might make a shift, is that they would like to have a ship that:

(1) Can take rougher weather
(2) Has a little more working deck space
(3) Has a little more permanent lab space
(4) Can carry a few more in the scientific party
(5) Is less noisy
(6) Has all of the present good features of the EBS
(7) Is a little faster
(8) Costs no more to operate (some of the users are on ONR or DOE money, where the ship charges come out of the research budget)

It is obviously impossible to meet all of these requirements simultaneously, but over recent months we have kept in touch with the market, have worked on modes of funding, and have now located several candidate ships.

While we don't have everything nailed down tight, we know that we will have to act rapidly if we are to replace the EBS at a price that we can afford without asking for federal funding. The market is currently turning around, and prices will probably be significantly higher in a very few months. We therefore submit this proposal without full details at hand, in the hope that the committee on fleet replacement can act at its February meeting.

We have considered the suggestion that fleet replacements should not be "more of the same." While this may apply to major ships, we don't think that it really applies to small ships doing coastal work. We have briefly considered catamarans; and have asked questions of experienced ship operators. For reasons of safety and economy, we feel that this would be a very unwise choice. We have also looked at SWATH (small waterplane area twin hull) ships, and have even test-driven one. These represent a significant potential design for a ship to replace the EBS replacement, a decade or two in the future; present engineering is not such that one could use a SWATH ship for service that requires safe and reliable operation, and a significant working load. This then brings us back to "one more of the same, a little bigger and a little better" to replace the EBS while the market is favorable.

We currently have three candidate ships under discussion, of which we prefer one. Since these are on the commercial market, can be sold to somebody else at any time, and since the price is still under negotiation, we would prefer not to list the ship name or the owner's name here. Suffice it to say that the following list of features, derived from one of the ships, in most respects applies to all of them.

Specification	R/V E.B.Scripps	Replacement ship
Type	Supply boat, low bow	Supply boat, high bow
Year built	1965	1979
Construction	Steel, hard chine	Steel, hard chine
Length overall	95 ft	115 ft
Beam	24 ft	26 ft
Draft (max)	9 ft	11.5 ft
Gross tons	115 tons	99 tons (!)
Manning	5	5
Bunks	13	24
Scientific party	8	19 or more
Clear deck space	20 x 40 ft approx	21.5 x 63 at present
Hold space	yes	no
Magazine	Class A, for 20 tons	no
Main engines	2 ea GM V12-71	2 ea GM V16-71N
Horsepower	350 ea	600 ea
Speed, full	9 kt	10 kt
Generators	2, each 40 kw	2, each 50 kw
Switchboard	Each, or parallel	Each, both, parallel
Controls	Bridge, & aft of house	Bridge, house, stern
Endurance (fuel, full speed)	26 days	About 26 days
Endurance, people	14 days (noise)	Greater
Deck boltdowns	yes	none (to be added)
Bowthruster	tunnel	none (may install jet thruster)
Lab space	108 sq fit builtin	None; plan 200 sq ft
Operating cost	$3000/day	$3300/day

The ship would be provided complete with not only standard items such as an autopilot, magnetic compass, SSB radio, EPIRB,

life rafts, stove, refrigerator (walk-in), freezer (walk-in), but even sheets, towels, repair parts, and minor expendable supplies. We would plan to build a 10 x 20 ft fixed lab on the port side, and a hydrographic boom on the starboard side, and to add tie-downs. The existing good equipment from the Ellen B. Scripps would be moved. This includes a new Faruno radar, a Magnavox SatNav, A-frame, 3 winches, Loran C, gyro, portable laboratories, satellite navigation receiver, capstans, and many smaller items. Much of this equipment is university owned; some of it is NSF-owned. We will request NSF permission to make the transfer.

The R/V Ellen B. Scripps has, since original acquisition, been operated as a UNOLS ship. We would propose to operate the new ship as a UNOLS ship, and to dispose of the Ellen B. Scripps shortly after the new ship is on line.

We request that your committee consider this plan at the next meeting, and inform us as soon as possible if there are any questions or problems with this plan. Because of the need for haste in order to take advantage of the market situation, we are seeking other approvals in parallel with this request. If there is need for any additional information, I will be glad to provide whatever information I can, either by phone or in person at the meeting.

Sincerely yours,

George G. Shor Jr.
Associate Director

Distribution:
Committee
UNOLS Office
Ron LaCount
John McMillan
Keith Kaulum

Posted: Wed Jan 25, 1984 1:42 PM EST Msg: BGIE-1703-3753
From: HAWAII.INST
To: Advisory.Council,UNOLS
CC: C.DAVIS
Subj: Memo to UNOLS Advisory Council

As you are aware, we expect to have the RV MOANA WAVE back in academic service in September of this year. Until then the RV KANA KEOKI will continue to service our various research programs as required. In August we will remove the RV KANA KEOKI from academic service and begin the transfer of much of the scientific equipment to the RV MOANA WAVE.

I have discussed the future of the KANA KEOKI with Ron La Count and think it would be useful if you were made aware of the same issues. The KANA KEOKI is still a very serviceable vessel. Its hull and mechanical plant are in good condition, and there is no doubt in my mind that the KANA KEOKI could have many years of cost effective service left. There are several factors that determine our future course of action; namely, (1) the vessel is owned by the University (i.e., the State of Hawaii), and any proceeds from the sale of the vessel would go directly to the State Treasury; (2) the market for used offshore supply vessels is saturated, and proceeds from such a sale would be only a few hundred thousand dollars, and finally, (3) proceeds from the lease of the KANA KEOKI to other entities can be retained by the University and used to offset other marine operation expenses.

In view of the above, it is clearly desirable to retain the ownership of the KANA KEOKI within the University of Hawaii and to lease it to other programs. We are currently exploring leasing possibilities both with private concerns as well as with long-term, single program, dedicated usage with a federal agency. We believe the vessel could be very useful within the UNOLS Community as well, and we would be willing to discuss this possibility with interested institutions.

The only use that we believe would be inappropriate at this point in time would be short-term contract research that would "remove business" from the support base generally available to the academic fleet.

We will keep you informed of our progress in finding a suitable use for the vessel and would appreciate any suggestions you might have.

Charles Helsley, Director
Hawaii Institute of Geophysics

Most Recent Inspection Report of KANA KEOKI
(December, 1979) Attached

THE UNIVERSITY OF TEXAS AT AUSTIN
INSTITUTE FOR GEOPHYSICS
AUSTIN, TEXAS 78712

Geology Bldg.
P. O. Box 7456
University Station
(512) 471-6156

MEMORANDUM

TO: Ferris Webster, Chairman, UNOLS
Robertson Dinsmore, Chairman, UNOLS Committee on Fleet Replacement
Charles Miller, Chairman, UNOLS Advisory Council

FROM: Arthur E. Maxwell, Director

DATE: January 17, 1984

SUBJECT: Replacement of R/V *FRED H. MOORE*

The University of Texas is planning to replace the R/V *FRED H. MOORE* at an early date. The reason being that the existing ship is unable to carry out the research program of the Institute for Geophysics. Conversion or extensive modification of the *FRED H. MOORE* is not practical.

It is our intent to build and outfit a research ship designed primarily for geological and geophysical research. We plan to have the latest geophysical equipment aboard; and we plan for the ship to be available to the academic community through UNOLS. Consequently, we are anxious that there be input from UNOLS in the early stages of design, in order that the ship will be responsive to the needs of others outside the University of Texas.

Dr. Joseph Phillips of our staff is chairing an internal committee to develop our scientific requirements. A copy of the committee's initial report is enclosed. You will note we are on a rather tight time schedule and, therefore, I am requesting input from UNOLS at the same time the material is going to our staff for review. We would be pleased to have UNOLS review these requirements and make recommendations that would enhance the ship characteristics such that it will serve the needs of the broad community.

It is the intention of the University to provide funds for preliminary design and construction; however, we anticipate we will need assistance in equipping the ship. This may be a substantial cost, since geophysical instrumentation has become highly sophisticated. Estimates are that the scientific equipment can easily cost as much as the ship itself. While the University will provide some funds for this equipment, we will be seeking matching funds. NSF, DOD and industry are our prime targets for this support.

I consider this as an opportunity for the UNOLS community to upgrade the fleet capability in a significant manner. Since the University of Texas will be making a major capital expenditure, we look to UNOLS for assistance in operational costs. I hope UNOLS will support and assist us in this endeavor. I will be pleased to interact with UNOLS in any manner you consider appropriate.

AEM:aj
Enclosure

cc: Grant Gross, NSF
Don Heinrichs, NSF
Ron LaCount, NSF
Doug Baker, ONR
Keith Kaulum, ONR
ONR, Austin Office
UTIG Ship Committee

THE UNIVERSITY OF TEXAS AT AUSTIN
INSTITUTE FOR GEOPHYSICS
AUSTIN, TEXAS 78751

4920 North I.H. 35
(512) 451-6468

M E M O R A N D U M

TO: UTIG Staff

FROM: J. D. Phillips

RE: The new UTIG Research Vessel - Performance Requirements

DATE: January 10, 1984

Enclosed is a Systems Matrix showing the proposed scientific observation and ship operation performance requirements with priority assignment for the new UTIG research vessel. Note that these are only proposed requirements, developed largely by myself and the new ship committee. For the new ship to meet all our needs, we invite your contribution to the requirements matrix and to assign priorities. You should add or delete systems as you believe appropriate, and/or change priorities of those systems already listed. Our plan is to develop an internal consensus on what the new ship should be before we solicit outside ideas and advice.

I also enclose a timetable and "PERT-type" chart showing the principal steps in constructing a new research ship. Note that we are now only at Step One in the implementation plan. We have a lot of work to do in a short time! Accordingly, please return your responses to me before Friday, 20 January 1984 so that I may incorporate them into a UTIG requirements proposal.

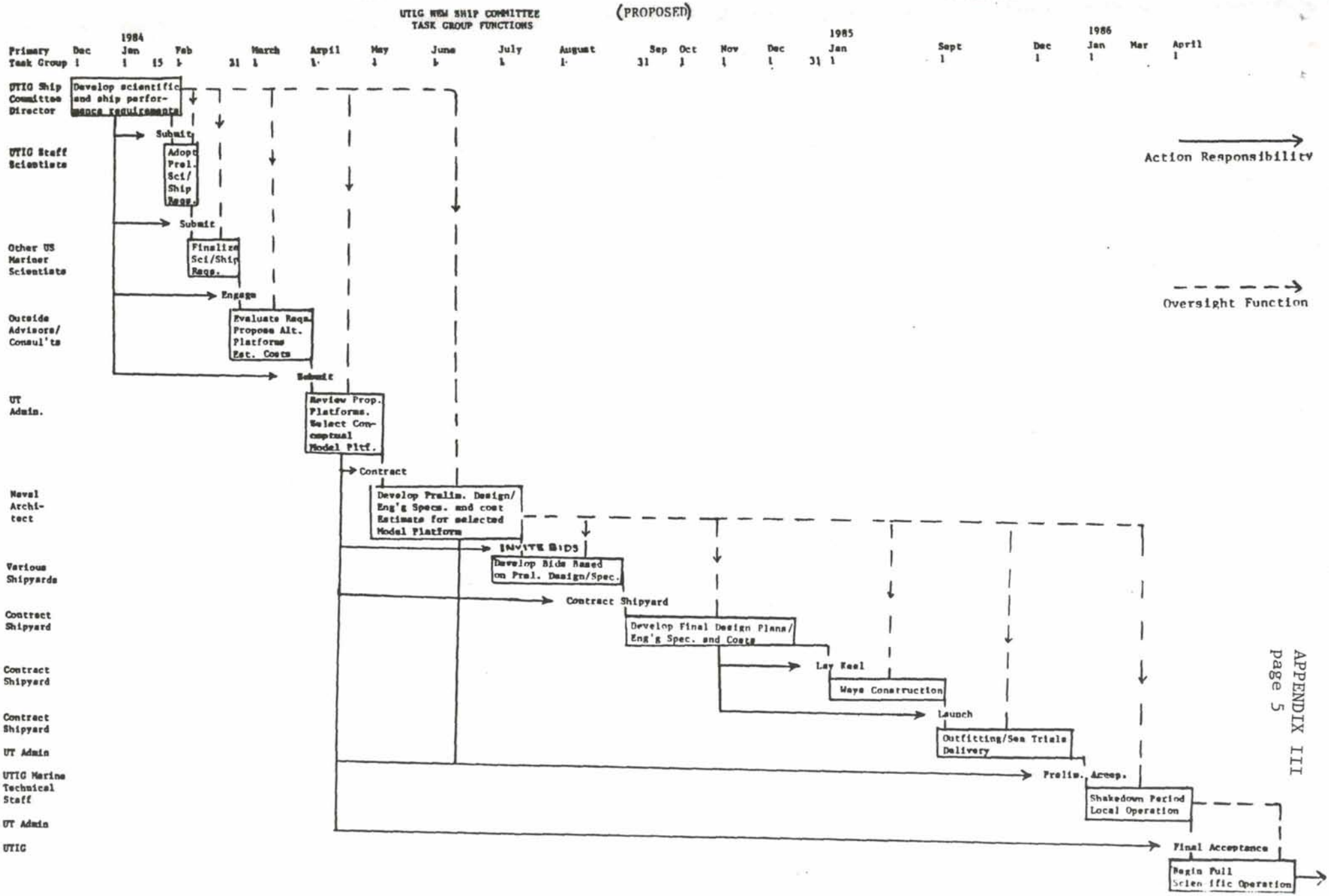
A meeting to adopt the UTIG requirements will be held at 0930 AM, Tuesday 24 January in the UTIG seminar room.

pje/enc

The University of Texas
Institute for Geophysics

Principal Steps for Building New Research Ship

	PROPOSED TIME TABLE
FORM RESEARCH SHIP COMMITTEE	Nov. 1983
1. Develop internal UTIG scientific/ship performance requirements (underway, on-station, observations/functions)	
2. Seek Oceanographic Community-wide consensus on overall requirements	
ENGAGE OUTSIDE CONSULTANTS/ADVISORS (Architects, ship operators, engineers, etc.)	Feb. 1984
3. Evaluate Alternative platform configurations for meeting requirements	
4. Develop initial platform designs and cost estimates	March 1984
5. Select conceptual model platform (i.e. hull type, size, range, equip. system)	
CONTRACT NAVAL ARCHITECT/DESIGNER	April 1984
6. Develop Preliminary Design/Engineering Specifications and cost estimate for selected platform configuration	
7. Submit Design Plans/Specifications to various shipyards for bid	June 1984
8. Evaluate formal bids based on preliminary plans and select shipyard	
CONTRACT SHIPYARD	Sept. 1984
9. Develop final design/specification and cost	
10. Begin construction	Jan. 1985
11. Launch and sea trials	
PRELIMINARY ACCEPTANCE	Dec. 1985
12. SHAKEDOWN PERIOD - LIMITED LOCAL OPERATIONS	Jan./Feb. 1986
FINAL ACCEPTANCE	March 1986
13. Begin full scientific operation	April 1986


UTIG NEW SHIP COMMITTEE
TASK GROUP FUNCTIONS
(PROPOSED)
1984
1985
1986
Primary Task Group
Dec 1
Jan 1
15
Feb 1
31
March 1
April 1
May 1
June 1
July 1
August 1
Sep 31
Oct 1
Nov 1
Dec 1
31
Jan 1
Sept 1
Dec 1
Jan 1
Mar
April 1
UTIG Ship Committee Director
Develop scientific and ship performance requirements
Submit
UTIG Staff Scientists
Adopt Prel. Sci/Ship Reqs.
Submit
Other US Mariner Scientists
Finalize Sci/Ship Reqs.
Engage
Outside Advisors/ Consul'ts
Evaluate Reqs. Propose Alt. Platforms Est. Costs
Submit
UT Admin.
Review Prop. Platforms. Select Conceptual Model Plfm.
Contract
Naval Architect
Develop Prelim. Design/ Eng'g Specs. and cost Estimate for selected Model Platform
INVITE BIDS
Various Shipyards
Develop Bids Based on Prel. Design/Spec.
Contract Shipyard
Contract Shipyard
Develop Final Design Plans/ Eng'g Spec. and Costs
Lay Keel
Contract Shipyard
Ways Construction
Launch
Contract Shipyard
Outfitting/Sea Trials Delivery
UT Admin
Prelim. Accep.
UTIG Marine Technical Staff
Shakedown Period Local Operation
UT Admin
Final Acceptance
UTIG
Begin Full Scientific Operation
Action Responsibility
Oversight Function

Proposed

DEVELOPMENT OF A PLAN FOR RESEARCH VESSEL REPLACEMENT AND CONSTRUCTION

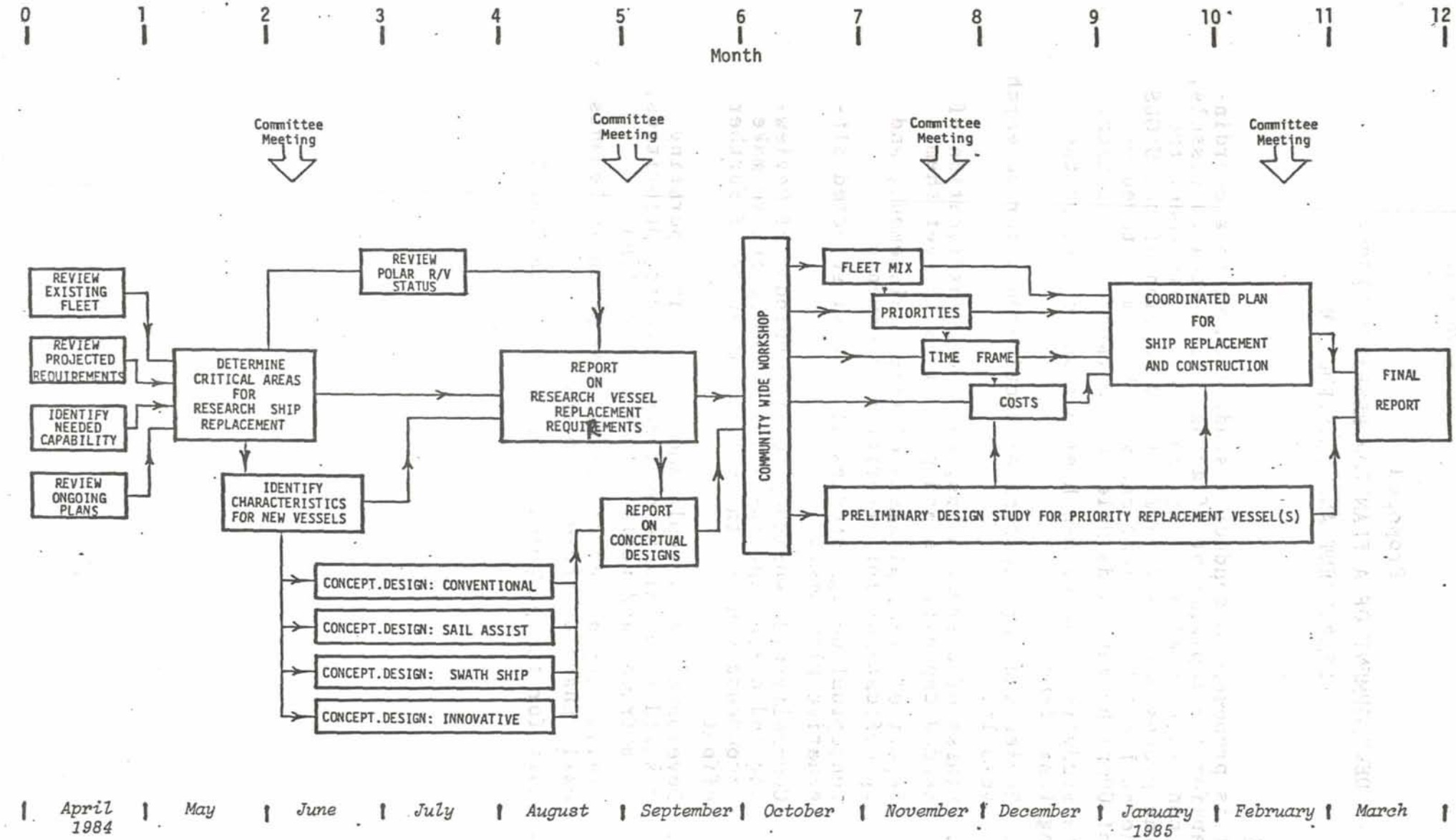
Abstract

It is proposed to conduct a study leading to a coordinated plan for the replacement of aging UNOLS Research Vessels, and the construction of new ships in order to implement the plan. The proposed study is under the direction of the UNOLS Committee on Fleet Replacement and will be administered on behalf of UNOLS by the Woods Hole Oceanographic Institution.

The study is a twelve month effort and comprises the following task elements:

- Review and verification of requirements for research vessels.
- Status of current ships, and the identification of needed capabilities and priorities to meet them.
- Report of critical areas of ship replacement, and specifications for priority replacements.
- Conceptual design studies of several selected alternative platforms.
- Community-wide workshop for the purpose of reviewing and discussing the above efforts, and to make recommendations on the nature and scope of further effort.
- Development of a replacement plan incorporating desired fleet mix to meet requirements, priorities, time frame, and costs of new construction.
- Preliminary design of vessel type which implements early phase or phases of plan.

The flow chart for the proposed study is shown in Fig. 1.



UNOLS COMMITTEE ON FLEET REPLACEMENT

PROPOSAL FOR

COORDINATED PLAN FOR SHIP REPLACEMENT AND CONSTRUCTION

JAN. 1984

Description of Task Elements

The proposed study comprises a number of elements which will be accomplished in several ways. These include:

- Review and analyses of existing reports and data by Woods Hole personnel assigned to the study, and the assistance and cooperation of the Staff of the Woods Hole Oceanographic Institution.
- Expert assistance in specialized areas will be from consultants drawn from within industry and the UNOLS community.
- Specialized tasks such as design studies, calculations and testing will be subcontracted to firms having experience and recognized credentials in the areas sought.
- Inputs by UNOLS Institutions and individual seagoing scientists will be from the broadest possible sources including questionnaires, correspondence, small working groups, and a community-wide workshop.
- Review and direction of the study will be by the UNOLS Committee on Fleet Replacement.

A description of each of the tasks is given in the following sections:

1. Review of Existing Fleet - A comprehensive analysis of the existing UNOLS vessels and other closely associated ships comprising the Academic Fleet will be undertaken for the purpose of establishing a baseline for the fleet. This will include ship descriptions, types of hull and construction, refit and alteration histories, recent surveys and other pertinent data. From this can be projected the remaining useful life span.

2. Review Shiptime Requirements - These requirements are the basic measure of research ship needs. Ship use from 1978-83 will be reviewed from UNOLS records. Projections of future requirements by program sponsors will be updated. These data will be used to update the various analyses and findings among the following recent reports:

   - *Capital Structure for Ocean Science - 1975.* (Center for Naval Analysis)
   - *Ocean Services for the Nation.* (NACOA - Jan.1981.
   - *Technology and Oceanography.* (Office of Technology Assessment, June 1981)
   - *Academic Research Vessels, 1985-1990.* (Ocean Sciences Board, National Research Council - 1982)
   - *Composition, Distribution and Management of the UNOLS Fleet.* (UNOLS Advisory Council - Oct.1982)

. *Federal Oceanographic Fleet Study* - (Federal Oceanographic Fleet Coordinating Council - in prep.)

Other inputs in this area will be from scientific project planning groups at various institutions. Groups, such as the Warm Core Rings Steering Group are in the leading edge of identifying facilities to meet the needs of science projects in the outyears.

3. Identify Ship Capability Needs - In addition to shiptime requirements which is a measure of numbers of ships in general size categories, specific ship capabilities to meet requirements need to be determined. These include seakeeping, endurance, speed, maneuverability, quietness, overside handling and a full range of scientific specifications. Recent years have seen these needs increasing. Adequate definitions in this area are important.

   This task element will compile a matrix of required capabilities from which a coherent set of ship characteristics can be derived.

4. Ongoing Plans - Current activity in retirement, replacement and new construction will be reviewed. The impact on future plans will be assessed, and any new or converted vessels will be included in any planning factors.

   Activity here includes:

   - Reassignment of R/V ATLANTIS II from general purpose work.
   - Plans for replacing VELERO IV.
   - Planned construction of new MG&G ship by University of Texas.
   - Replacement of E.B.SCRIPPS.

It is anticipated that Items 1-4 above will proceed concurrently and will require about one month of effort.

5. Critical Areas for Research Ship Replacement - From the foregoing reviews an assessment will be made and a report prepared to determine where replacement is becoming a critical issue and new construction should be planned for in order to meet projected ship requirements and capability needs.

   Based on information already available, and from existing UNOLS Recommendations, it is anticipated that critical replacement determinations will be in the larger ship categories (Class A & B)

6. Characteristics for New Vessels - Based on the identification of critical replacement requirements and capability needs for new vessels, this phase of the study will identify the characteristics for new vessels. Priorities amongst these characteristics will be assigned along with tradeoffs where required.

   Work statements for the conceptual design of several alternative platforms (described below) will be prepared.

It is anticipated that Items 5 & 6 above will require about 1½ months of effort. Direction in these areas will come from the UNOLS Committee on Fleet Replacement with the broadest possible input from the overall community and from naval engineering and scientific consultants.

7. Conceptual Design Studies - Several conceptual design studies will be undertaken for alternative platforms responsive to the characteristics stated. The scope of the conceptual design envisioned here shall include:

   - Technical description of the vessel design.
   - Discussion of the vessel design and its responsiveness to the scientific requirements and ship characteristics stated.
   - Summary of ship specifications.
   - General arrangements plans,
   - Inboard profile and outboard profile plans.
   - Scientific arrangement.
   - Machinery arrangement.
   - Operating characteristics, including costs.
   - Estimated construction cost.
   - Artist's conception drawing.

   The platforms selected for conceptual design studies will be determined by processes and recommendations within the foregoing scope of effort. Based on existing recommendations, the following examples are noted.

   - Conventional monohull design. New large research vessels now under construction by UK, USSR and NATO are of this type.
   - Semi-submersible vessel. Such a design otherwise known as "Small waterplane area twin hull" - SWATH, or S^3, is growing in popularity because of its dynamic stability and relatively large working areas.
   - Sail Assist. This may range from a total sail design to sail assist appendages on a powered hull. Its potential attractiveness, especially in fuel cost savings, cannot be ignored.
   - New and Innovative Design. Here, and at this stage, an opportunity should be presented for new research and concepts in research ship design.

It is anticipated that the Conceptual Ship Designs will proceed concurrently and will occupy about two months of effort each. The conventional design will be undertaken by the resident naval architecture staff at the Woods Hole Oceanographic Institution with assistance by outside consultants. Other design studies will be subcontracted to outside firms having proven expertise in the areas desired.

10. Community-Wide Workshop - Midway through the Study, at about the sixth month, a workshop will be conducted for the purpose of reporting on all work to date and receiving the broadest possible inputs on projected research ship requirements and concepts of ship types to meet the requirements.

Of special importance here will be a critical review of the Report on Research Vessel Replacement Requirements, and the Reports on Conceptual Designs. Community concensus, or as close to it as possible, is essential to a successful completion of the Study.

It is planned that the Workshop will be held at a major center for marine science and will attempt to attract as many practicing scientists and concerned individuals as possible. The Study budget includes travel funding for fifteen invited participants. Observers from appropriate Federal Agencies will be invited.

The Workshop and associated external reviews inserted at this stage should result in guidance for further replacement planning and, most importantly, a selection of the vessel hull type and characteristics from amongst the conceptual design studies. This is a critical decision for further design study and development.

It is anticipated that the Community Wide Workshop will be a two-day event and will include a report of proceedings, recommendations and minority opinions.

11 Plan Development - Based on prior study information, workshop recommendations and other external inputs, plan development for ship replacement and construction will be undertaken in a step series. These will include:

- Fleet Mix - the number and types of vessels which should go to make up a UNOLS Fleet between the years 1990 - 2000.
- Priorities - set for the purpose of providing the most needed replacements and/or construction.
- Time Frame - an orderly and realistic schedule by which to proceed with replacement planning over the next decade.
- Costs - of ship construction on an annual and basis which fulfills the above.

It is anticipated that Plan Development will proceed in a stepwise fashion and will take a total of about 2 - 2½ months of effort.

Project Participants

The steering and advisory group for the Proposal Effort is the UNOLS COMMITTEE ON FLEET REPLACEMENT. The function of the Committee as charged by UNOLS is:

1) *An immediate start on planning for replacement for Class A and Class B ships (large, long-range vessels, some of them with special purposes). We must retire some of these by the 1990's. Such ships are essential to our capability for modern oceanography. Planning for replacement must begin now. The committee will prepare and propose mechanisms for drawing specific plans for new platforms.*

2) *A full schedule for replacement of intermediate (C and D) vessels must be prepared. Planning for at least one replacement in the late 1980's must begin now.*

3) *Detailed consideration is required of new means to promote greater cost efficiency, particularly fuel efficiency. We also need specific anticipation to meet the needs of oceanography in the 1990's.*

The Committee comprises the following persons:

R. P. Dinsmore, Chairman
Woods Hole Oceanographic Institution

George Keller
Oregon State University

John Martin
Moss Landing Marine Laboratories

David Menzel
Skidaway Institute of Oceanography

Worth Nowlin
Texas A & M University

Derek Spencer
Woods Hole Oceanographic Institution

Fred Spiess
Scripps Institution of Oceanography

The role of the Committee will be to monitor the progress of the work and direct the nature and scope of effort in

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

13 February 1984

Dr. Arthur E. Maxwell, Director
Institute for Geophysics
The University of Texas at Austin
Austin, Texas 78712

Dear Dr. Maxwell:

The UNOLS Advisory Council has reviewed the documents you have sent us (17 January 1984) concerning a replacement for the FRED H. MOORE. Thank you for submitting them. UTIG has done well to generate the resources for preliminary design and construction of a ship entirely from university funds. Thus, any criticism of your plans may strike you as ungrateful. However, we are deeply concerned with three aspects of the proposed replacement.

First, the proposal for a specific ship replacement comes just prior to a major UNOLS effort to define ship replacement and new facility needs. The "NEW MOORE" might be better designed for the needs of the community, institutionalized as UNOLS, if it were built in accordance with fleet replacement plans soon to emerge. The date projected for a formal plan is March 1985. The work of developing this plan is, as you know, in the hands of a committee chaired by Capt. Robertson Dinsmore of Woods Hole. He can give you further details of the planned activities of the fleet replacement committee.

Second, the UTIG scientific/ship requirements listed in the documents are extremely narrow. The ship appearing in those plans is to be designed entirely with geological and geophysical needs in mind. Perhaps that is understandable for a plan from an institute for geophysics. However, the lip service paid to chemical, physical, and biological oceanography at the end of the list was only that. It is clear that no general capability for oceanographic research has been considered for the "NEW MOORE". This could lead to a ship unsuitable for general UNOLS use.

Third, since the plans for this ship include elaborate, modern geophysical gear (multi-channel seismic recording, bore hole instrumentation with reentry capability, seabeam, etc.) we must point out that the demand within UNOLS for more that 4 to 6 months shiptime applying these techniques, particularly MCS, does not appear to exist at present. That time is already available in the UNOLS fleet and undersubscribed. It will in fact be extended in the coming year with the return to the fleet of MOANA WAVE equipped extensively for geology and geophysics. It seems likely that a replacement for the MOORE in the form projected in your documents will exacerbate the present oversupply. We are, of course, not certain this situation won't change.

In summary, we find your proposal is somewhat premature with respect to

UNOLS planning, that the ship contemplated shows no planning for inclusion in the UNOLS fleet as a general oceanographic vessel, and that it represents potential oversubscription nationally to dedicated G&G vessels. We recommend that the University of Texas at Austin consult directly with the UNOLS Committee on Fleet Replacement (through Capt. Dinsmore of WHOI) concerning general design desiderata, and that much more interaction with UNOLS occur before specific construction plans are developed. We note that you have sent the fleet replacement committee these documents, and they will be responding shortly.

Again, we appreciate that resources for construction of a MOORE replacement are partly available from sources in Texas, and we commend UTIG for developing those sources. However, it would be unfortunate to prepare a ship which may become dependent upon general UNOLS use and federal project funds for its support without full involvement of UNOLS in design. Best of luck with developing this interaction, and let us know when we can help you.

Sincerely yours,

Charles B. Miller

Charles B. Miller
for the UNOLS Advisory Council

Copies to:

Ferris Webster, Chairman UNOLS
Ronald LaCount, NSF
Keith Kalum, ONR
Robert Rowland, USGS
Capt. Robertson Dinsmore, WHOI
William Barbee, UNOLS Office

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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for the coordination and support
of university oceanographic facilities

13 February 1984

Dr. Charles Helsley, Director
Hawaii Institute of Geophysics
2525 Correa Road
Honolulu, Hawaii 96822

Dear Dr. Helsley:

The UNOLS Advisory Council has reviewed your letter concerning disposition of KANA KEOKI. Thank you for informing us of your thinking regarding the issue. Based on the data available to us, it appears that operation of KANA KEOKI under UNOLS standards has become progressively more expensive and difficult. Continued operation and maintenance of KANA KEOKI by Hawaii Institute of Geophysics seems certain to be a large drain on your resources, and thus indirectly on UNOLS and NSF. We would prefer to see Hawaii divest itsefl of KANA KEOKI when MOANA WAVE is again available for operation as a UNOLS vessel. At a minimum, the arrangement for disposal should remove HIG from any direct concern for maintenance or operation.

Since the University of Hawaii is owner of KANA KEOKI, UNOLS cannot direct you as to its disposition. However, as a state agency the University should be able to negotiate a favorable agreement with the State of Hawaii with respect to use of funds deriving from value remaining in KANA KEOKI. We wish you good fortune in obtaining the best possible deal.

Sincerely yours,

Charles B. Miller

Charles B. Miller
for the UNOLS
Advisory Council

copy to William Barbee

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

13 February 1984

Dr. George Shor, Associate Director
Scripps Institution of Oceanography
University of California, San Diego
La Jolla, CA 92093

Dear Dr. Shor:

Thank you for informing UNOLS of the plan at Scripps for replacing the E. B. SCRIPPS. The UNOLS Advisory Council has reviewed the plan, preliminary to its consideration by the Fleet Replacement Committee. It appears to us that the proposal represents a minimal change in the effective composition of the UNOLS fleet. It should provide the Southern California area scientists with a ship more effective than E. B. SCRIPPS and considerably pleasanter to use in terms of noise and ride. The costs projected sound modest, and we congratulate you on finding the the funds within the state of California.

Best of luck in finding the right ship at the very lowest price.

Sincerely yours,

Charles B. Miller

Charles B. Miller
for the UNOLS Advisory
Council

copy to William Barbee

SUMMARY OF OBLIGATIONS BY APPROPRIATION FY 1984-1985

(DOLLARS IN MILLIONS)

	FY 1984	FY 1985	CHANGE FY 85/84 AMOUNT	CHANGE FY 85/84 CHANGE
RESEARCH AND RELATED ACTIVITIES APPROPRIATION	$1,141.7	$1,308.2	$166.5	14.6%
U.S. ANTARCTIC PROGRAM APPROPRIATION	102.4	115.1	12.7	12.3%
SCIENCE AND ENGINEERING EDUCATION APPROPRIATION	75.0*	75.7	0.7	0.9%
SPECIAL FOREIGN CURRENCY APPROPRIATION	2.9	2.8	-0.1	-3.9%
TOTAL, NSF	$1,322.0	$1,501.8	$179.8	13.6%

*AN ADDITIONAL $13.9 MILLION WILL BE AVAILABLE AS A RESULT OF CARRYOVER FROM FY 1983

DOLLAR AMOUNTS HAVE BEEN ROUNDED; % CHANGE HAS BEEN CALCULATED ON ACTUAL DOLLAR AMOUNTS

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1 31 84

NSF OBLIGATIONS BY BUDGET ACTIVITY FY 1984-1985

(DOLLARS IN MILLIONS)

BUDGET ACTIVITY	FY 1984	FY 1985	CHANGE FY 85/84
MATHEMATICAL AND PHYSICAL SCIENCES	$ 358.8	$ 416.7	16.1%
ENGINEERING	120.7	147.1	21.8%
BIOLOGICAL, BEHAVIORAL, AND SOCIAL SCIENCES	224.7	253.1	12.7%
ASTRONOMICAL, ATMOSPHERIC, EARTH AND OCEAN SCIENCES	330.0	373.5	13.2%
SCIENTIFIC, TECHNOLOGICAL, AND INTERNATIONAL AFFAIRS	40.8	46.9	14.9%
PROGRAM DEVELOPMENT AND MANAGEMENT	66.6	70.9	6.5%
SUBTOTAL, RESEARCH & RELATED ACTIVITIES	$1,141.6	$1,308.2	14.6%
U.S. ANTARCTIC PROGRAM	102.5	115.1	12.3%
SCIENCE AND ENGINEERING EDUCATION	75.0*	75.7	0.9%
SPECIAL FOREIGN CURRENCY	2.9	2.8	-3.9%
TOTAL	$1,322.0	$1,501.8	13.6%

*AN ADDITIONAL $13.9 MILLION WILL BE AVAILABLE AS A RESULT OF CARRYOVER FROM FY 1983.

DOLLAR AMOUNTS HAVE BEEN ROUNDED; % CHANGE HAS BEEN CALCULATED ON ACTUAL DOLLAR AMOUNTS.

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ASTRONOMICAL, ATMOSPHERIC, EARTH AND OCEAN SCIENCES
FY 1984-1985
(DOLLARS IN MILLIONS)

	FY 1984	FY 1985	% CHANGE FY 85/84
ASTRONOMICAL SCIENCES	$78.1	$93.4	19.5%
ATMOSPHERIC SCIENCES	89.3	98.6	10.3%
EARTH SCIENCES	41.5	48.6	17.1%
OCEAN SCIENCES	113.7	124.9	9.9%
ARCTIC RESEARCH PROGRAM	7.4	8.0	8.2%
TOTAL	$330.0	$373.5	13.2%

DOLLAR AMOUNTS HAVE BEEN ROUNDED; % CHANGE HAS BEEN CALCULATED ON ACTUAL DOLLAR AMOUNTS

OD 84 229
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U.S. ANTARCTIC PROGRAM
FY 1984-1985
(DOLLARS IN MILLIONS)

	FY 1984	FY 1985	% CHANGE FY 85/84
U.S. ANTARCTIC RESEARCH PROGRAM	$10.2	$11.0	7.4%
OPERATIONS SUPPORT PROGRAM	92.2	104.1	12.9%
TOTAL	$102.4	$115.1	12.3%

DOLLAR AMOUNTS HAVE BEEN ROUNDED; % CHANGE HAS BEEN CALCULATED ON ACTUAL DOLLAR AMOUNTS

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R&D FACILITIES, EQUIPMENT AND INSTRUMENTATION FY 1985

(DOLLARS IN MILLIONS)

	TOTAL FY 1985 (EST.)	CHANGE FY 1985/1984 DOLLARS	CHANGE FY 1985/1984 PERCENT
MATHEMATICAL AND PHYSICAL SCIENCES	$ 99.0	$16.8	20.4%
ENGINEERING	24.0	5.8	31.9%
BIOLOGICAL, BEHAVIORAL AND SOCIAL SCIENCES	28.4	3.8	15.4%
ASTRONOMICAL, ATMOSPHERIC, EARTH AND OCEAN SCIENCES	59.1	9.7	19.6%
U.S. ANTARCTIC PROGRAM	23.9	3.7	18.3%
SCIENTIFIC, TECHNOLOGICAL, AND INTERNATIONAL AFFAIRS	2.6	0.2	8.3%
TOTAL	$237.0	$40.0	20.3%

NSF FY 1985 OCEAN SCIENCES BUDGET

	FY1983	FY1984	FY1985 ESTIMATE	DIFF. FY85/4	PCT.DIFF. FY85/84
Ocean Science Research					
Phys. Ocean.	14.7	15.5	17.2	1.7	11.0
Marine Chem.	10.8	12.0	13.4	1.4	11.7
Sub. Geol. & Geop.	12.6	14.5	16.1	1.6	11.0
Biol. Ocean.	11.8	12.6	14.2	1.6	12.7
Sub Total	49.9	54.6	60.9	6.3	11.5
Ocean Facil. & Support					
Operations	26.2	25.4	28.2	2.8	11.0
Ocean. Tech.	5.4	7.4	8.2	0.8	11.4
Sub Total	31.6	32.8	36.4	3.6	11.1
Ocean. Drlg. Prog.					
Ocean Drlg.	27.8	29.5	37.6	8.1	27.5
Less Foreign	(6.3)	(1.2)	(10.0)	8.8	733.3
Less Other U.S.	(0.5)	(2.0)	(-0-)	(2.0)	(100.0)
Sub Total	21.0	26.3	27.6	1.3	4.9
TOTAL	102.5	113.7	124.9	11.2	9.9