UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

COMPOSITION, DISTRIBUTION AND MANAGEMENT OF THE UNOLS FLEET

A Report and Recommendations

Prepared by

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UNOLS ADVISORY COUNCIL

FLEET STUDY

October 14, 1982

CHAPTER ONE

INTRODUCTION

On May 23, 1982 the UNOLS Advisory Council accepted a charge from the National Science Foundation and the Office of Naval Research to:

"develop specific recommendations on a ship-by-ship basis for the composition, distribution and management of the UNOLS fleet in the 1983-1988 time frame."

In meeting this charge, the Council confronted the fundamental problem facing U.S. Oceanographic Science - there is insufficient funding for oceanographic research. Problems with ships and other major facilities are only symptoms. Inflation has eroded the financial base for oceanographic research which is and must be public support. Statistics issued by the National Science Foundation, Division of Ocean Sciences in 1980 illustrate that it was supporting 20% fewer scientists in 1980 than in 1975. Additional statistics indicate that many highly rated proposals for marine science projects were being declined. Since 1980 these negative trends have continued. Funding from the Office of Naval Research, an agency which in the past supported much significant research, has declined even more. For example, one major oceanographic institution has seen its support from ONR decline from 56% of its total research expenditures in 1971 to 25% in 1981 despite continued proposal pressure. Support of ship time by ONR at that same institution declined from 52% to about 15% over the same period.

The overall decline in support is not associated with a decrease of the scientific or practical value of ocean science, nor is it due to lowering of the quality of investigators or their ideas; indeed, the impetus for significant new oceanographic research has never been stronger.

Funding for ocean science (including Great Lakes research) is now grossly inadequate. The Advisory Council deplores its assigned task to recommend reductions of a fleet that is already inadequate to support the excellent ocean science proposed around the nation. The report "Academic Research Vessels 1985-1990" by the Ocean Sciences Board of the National Academy of Sciences provides documentation of the many timely research programs which can provide greatly needed information affecting the social, economic and defense interests of the United States, in addition to providing most important contributions to the nation's intellectual resources. Potential projects include investigations of Antarctic resources, of the ocean as a repository for general wastes, and for high level radioactive waste, of the relation

between ocean processes and climate, and of crustal dynamics in the deep ocean and at the continental margins. To these may be added studies of hydrothermal activity at mid-ocean ridges, of processes that form the earth's crust on which we live, of ocean physics, and of environmental prediction relative to national security. The Ocean Sciences Board report correctly points out that these programs alone, even though they form only a fraction of the excellent science that should be implemented, could utilize all of the academic vessels greater than 150 feet currently operated in the fleet.

Oceanographic science is ripe with new opportunities. Just as examples, new opportunities for biological studies of the sea appear daily. The United States can lead in studies of the possible origin of life in deep-sea vents, of the fundamental ecology of pelagic ecosystems, of the biogeochemistry of carbon dioxide, and of the dynamics of food chains supporting world fisheries. It is inexcusable, but likely, that we will fail to lead in these studies at the present funding levels. Currently the United States is the leader in geo-physical fluid dynamics of the seas. We must maintain the academic research ships which support that leadership capability.

The Advisory Council undertakes its assigned task solely to remedy the growing imbalance between available scientific funds and shiptime. A more appropriate response by the nation to the fundamental problem would be a greater commitment to the support of oceanography. The Advisory Council contends that returns from this investment would be excellent. It is a modest goal for the United States to lead the world in oceanographic research just as it does in astronomy, space science, nuclear physics and medicine. We are the nation which can best afford a full share of this work which in fact benefits all humanity. Furthermore, any nation lacking the capability or knowledge for assessing ocean processes is at a significant disadvantage. Much of the research that needs to be done can best be accomplished by the academic community. By any set of rational values it is clear that this knowledge must be actively pursued as a national goal.

Return to the level of scientific activity in academic oceanography of the early 1970's now requires an additional investment of about $65 million per year. The Advisory Council strongly recommends that every effort be expended by every responsible body, particularly NSF and ONR, to achieve this modest new appropriation. Exercises to reduce the academic fleet do not address the fundamental problem nor do they serve the best interests of the United States.

Despite the fact that our charge from NSF and ONR addresses only a symptom of the basic issue, the Advisory Council accepted the task as a responsibility relegated to the Council by the UNOLS Charter. The charge, background material, and the Advisory Council's scheduled procedure were described in a June 14, 1982 letter from Derek Spencer to UNOLS Members and Associate Members (Appendix I). A workshop was held on July 8 & 9, 1982 and a progress report was issued on July 20 (Appendix II). A second workshop was held August 18-20 during which written material and personal presentations were received in response to the July 20 report. A draft final report was issued on September 16 and additional written responses by the community were received (Appendix III). The present document is the final report of the Council's deliberations to date. It describes the Council's recommendations for bringing fleet composition into line with the projected needs of federally funded academic ocean science research, and discusses the justification and effects of those recommendations.

I. Assessment of Input Material to the July Workshop

The Advisory Council was provided with items described on page five of Derek Spencer's letter of June 14 and, prior to their July meeting, received specific input from the following UNOLS Members: University of Miami, Woods Hole Oceanographic Institution, Scripps Institution of Oceanography, University of Alaska, University of Washington, Texas A & M University, Lamont-Doherty Geological Observatory, University of Rhode Island, University of Southern California, University of Hawaii and University of Texas.

Several documents available to the Advisory Council were useful as background information. In particular, the National Academy of Sciences' Ocean Sciences Board Fleet Study, "Academic Research Vessels, 1985-1990" and background material from NSF and ONR program officers were convincing that modern United States academic ocean science is vibrant with the approaches, techniques and the intellectual capability needed to answer important and exciting, practical and scientific questions about the world's oceans and their processes. The National Academy of Sciences' committee and the NSF program managers agree that project funding for U.S. academic ocean sciences will be inadequate to support all intellectually worthwhile science. They also agree that due to the dwindling levels of funds for research, the current academic fleet will have to contract if ship and science funding are to be appropriately balanced. The NAS report suggests that an 18% excess capacity exists in the overall 1981 UNOLS fleet, and the NSF program managers project significant excess capacity (40-60%) in the smallest two classes of UNOLS vessels in 1983. However, the program managers note that the 1983 use of these vessels may have been underestimated. The Advisory Council also considers that these projections are underestimated. Proposed 1983 schedules for the 100-149 foot class obtained from UNOLS Members project more than twice as many days of use as the NSF program managers forecast for 1983. Long-term ship use projections are usually inaccurate. Analysis of historical ship use data from 1973-1980 shows wide variations in the use of different vessels from one year to the next. This widely recognized imprecision in ship use projections gave the Council grave reservations about reaching irreversable decisions based on such projections.

II. Input to the August Workshop

Written responses to the July 20 report were received from most UNOLS Member institutions which operate UNOLS fleet vessels. Personal presentations were made at the workshop on August 18, by: University of Hawaii, Texas A & M University, Johns Hopkins University, University of Texas, Lamont-Doherty Geological Observatory, University of Miami, Moss Landing Marine Laboratories, University of Southern California, University of Washington, Scripps Institution of Oceanography, University of Delaware, and University of Michigan.

III. Criteria for Ship Retention

The Advisory Council read and discussed a document entitled "Criteria for Assessing Ship Retention Value" provided by the NSF Ocean Sciences Division (Appendix 2 of the July 20 report), as well as relevant portions of the NAS report on "Academic Research Vessels, 1985-1990" (primarily Chapters IV and V). The Council agreed that the NSF document contained all appropriate criteria and was wise in refraining from recommending mechanical application of any single criterion or system of criteria. No single set of constantly weighed criteria could be consistently applied across the fleet such that the Council was satisfied with the efficacy of the results. The Council's discussions demonstrated the obvious need to weigh certain factors differently in assessing the value of retaining individual vessels as part of the UNOLS fleet. For example, the Council found the criterion of regional importance to dominate the discussions of UNOLS vessel capabilities in Alaska and Hawaii, whereas the value of maintaining as many operating centers as possible was critical in assessing which ships within a given class were to be retained. A guiding principle of the deliberations was that the ships themselves are national rather than institutional assets, and that recommendations for appropriate relocations are entirely proper within the context of meeting the Council's charge. The principal criterion for evaluating overall fleet composition was projected use by funded research programs. This factor was compared with past and projected future levels of ship availability, and actual use levels in the past. Figures 3.1, 3.2 and 3.3 in Chapter Three display these levels. The specific criteria applied to each of the Council's present recommendations are discussed in Chapter Three. In the present report the terms "layup" and "retire" refer respectively to vessels being temporarily or permanently out of service through the mechanism of removing federal support.

CHAPTER TWO

THE UNOLS FLEET

The National Academy of Science's Ocean Sciences Board Fleet Study and the NSF Task Group Report classify the vessels in the UNOLS Fleet by size. While this is useful for funding comparisons, the Advisory Council, in approaching the task of defining a minimum fleet to meet currently funded science, decided to consider capability and function to establish classes of vessels. While size is correlated with these characteristics, it is the capability and function of the vessel that determine its effectiveness as a tool of the ocean science.

We consider that the current UNOLS fleet may be functionally grouped into six classes.

Class A. Large vessels with extended range and endurance, with berthing for twenty or more scientists and sufficient laboratory and storage space and equipped to meet the diverse needs of multiple scientific objectives.

Class B. Large vessels equipped with facilities to perform special tasks whose schedules are partially determined by the science needing those tasks. These vessels also have extended range and endurance, bunk space for twenty or more scientists, and they can accommodate some general purpose operations.

Class C. Intermediate vessels with moderate range and endurance and with berthing for about fifteen scientists. These vessels, while possessing the capability to perform trans-oceanic cruises, are limited by berthing, storage, lab space or seakeeping from performing some multi-purpose and extended expeditionary work. They are efficient and cost effective alternatives to the Class A vessels for regional, shorter range, multi-purpose tasks, and for some extended range tasks.

Class D. Coastal, general purpose vessels, greater than 100 feet, of limited range and endurance with berthing for about twelve scientists. These vessels are equipped for certain deep sea operations and have modest laboratory and storage spaces that are sufficient to meet the needs of coastal and continental shelf programs.

Class E. Coastal, general purpose vessels, typically less than 120 feet with displacements less than 300 tons, with ten or less scientific berths, that are crewed for cruises of several days extent.

Class F. Coastal, general purpose vessels, less than 100 feet, with berthing for ten or less scientists. These vessels carry minimum crews and are generally unsuited for other than short overnight cruises or on-station activities of several days in clement regions.

The UNOLS vessels currently in these classes are listed in Table 2a. We assume that the conversion of the R/V ATLANTIS II as a support vessel for the DSRV ALVIN will proceed during 1983 and the MOANA WAVE will be refit and available for return to the fleet by 1984.

A Minimum Fleet

Tables 2b and 2c give an analysis of projected ship use by the NSF Task Group. The Advisory Council concurs with the NAS-OSB report, the NSF Task Group, and other observers that the current UNOLS fleet has a capacity that is in excess of that sufficient to meet the needs of the currently funded ocean science research projects. This situation occurs because of the erosion of ocean science budgets in ONR, NSF and other federal and state agencies. The decline in real funding caused by inflating costs while budgets shrink or remain static is not a recent phenomenon. The UNOLS fleet has shrunk from 35 vessels in 1971 to the 25 vessels comprising the current fleet of ships (Table 2a; note that this total excludes MOANA WAVE which has been exclusively in service to NAVELEX but is proposed to return to the fleet by 1984; and the LAURENTIAN and CAPE HENLOPEN, which are funded on a project basis only). Classes A and B have been reduced from 8 to 6 since 1971.

Class A and B ships constitute the backbone of the U.S. academic, blue-water, global research fleet. It has been through use of ships in these two classes that many dramatic advances have been made in the past few decades in the marine sciences. The Advisory Council concurs with the OSB study that it is essential to maintain a strong capability in this part of our fleet to the extent that cost efficiency, scientific efficiency, and need can be convincingly demonstrated. However, because of much greater cost of maintaining and operating these vessels, we suggest that a modest undersupply of ship availability in this class is better than an oversupply. Queuing for use of these vessels, which has long been the practice for operations in remote parts of the world, will contribute to efficient shared use and planning.

The six vessels in Classes A and B are unique national assets, essential to the health and vitality of U.S. oceanography. The permanent retirement, without replacement, of any of these vessels will have deep and harmful effects on the national capability to conduct global research in the oceans and to carry out large-scale multi-investigator research in U.S. waters or adjacent regions. Despite the undeniably negative impact and on the basis of data for past use and projections for future use (available in August, 1982), a tentative recommendation is made:

1. *The number of Class A vessels should be reduced from three to two starting in Calendar Year 1984.*

The UNOLS fleet will have eight intermediate size (Class C) vessels in 1984. These ships have become increasingly important research platforms as U.S. oceanography has evolved to complement a mode of worldwide exploration with one of more detailed observational programs focused on specific problems. In spite of this, it is the opinion of the Advisory Council that six Class C ships can meet the needs of the currently funded science and the

Table 2a.

THE CURRENT UNOLS FLEET

Data From Current Ship Operating Proposals (6/30/82)

SHIP	OPERATING INSTITUTION	LOA (FT)	DISP. (TONS)	YEAR BUILT	NUMBER SCIENT.	NUMBER CREW	RANGE (NM)	ENDURANCE DAYS	1982 OPERATING COSTS (K$) *
CLASS A									
Knorr	WHOI	245	1,915	1969	25	24	10,000	45	3,000
Melville	Scripps	245	2,075	1970	29	23	9,000	45	3,000
Thompson	U. Wash.	209	1,302	1965	19	22	8,000	40	2,200
CLASS B									
Atlantis II	WHOI	210	2,300	1963	25	24	13,500	45	3,000
Conrad	LDGO	209	1,370	1962	19	20	10,000	60	2,200
T. Washington	Scripps	209	1,362	1965	19	23	9,000	35	2,500
CLASS C									
Endeavor	URI	177	962	1976	16	12	7,000	30	1,600
Gyre	TAMU	174	950	1973	20	10	11,000	42	1,600
Iselin	RSMS	170	830	1972	15	12	12,000	30	1,600
Kana Keoki	U. Hawaii	156	900	1967	16	12	10,000	42	1,100
Moana Wave	U. Hawaii	174	950	1973	11	11	8,000	40	(1,600)
New Horizon	Scripps	170	770	1978	13	12	6,000	30	1,600
Oceanus	WHOI	177	960	1975	12	12	7,000	30	1,600
Wecoma	OSU	177	1,015	1975	16	12	7,500	30	1,600
CLASS D									
Alpha Helix	U. Alaska	133	554	1966	15	9	6,500	30	1,400
Cape Florida	RSMS	135	539	1981	12	9	7,680	21	1,200
Cape Hatteras	Duke/UNC	135	539	1981	12	10	6,800	24	800
Velero IV	USC	110	650	1948	12	11	5,500	18	700
CLASS E									
Cape Henlopen	U. Del.	120	179	1976	12	7	2,560	14	**
Cayuse	MLML	80	173	1968	8	7	4,500	20	600
E. B. Scripps	Scripps	95	234	1965	8	5	5,100	14	700
Laurentian	U. Mich.	80	175	1974	14	4	2,500	14	**
R. Warfield	CBI	106	162	1967	10	7	1,200	14	700
CLASS F									
Blue Fin	Skidaway	72	86	1972	8	5	2,660	15	150
Calanus	RSMS	64	111	1971	6	2	2,500	14	300
Hoh	U. Wash.	65	81	1943	6	2	600	5	150
Longhorn	U. Texas	80	172	1971	10	5	2,000	20	350
Onar	U. Wash.	66	95	1954	6	2	1,000	5	150
								Total Costs	33.8
								(Excluding Moana Wave)	

* Adapted from NSF Task Group report "Projected Ship Needs for Ocean Science Research 1983-1988".

** Vessels currently on project-by-project funding basis.

TABLE 2b. PAST AND PROJECTED SUMMARY OF USE DAYS BY CLASS FOR NSF, ONR, AND OTHER SPONSORS, CY1978-1983*

Sponsor	NSF** Class	1978	1979	1980	1981	1982(est)	1983(Proj)
NSF	1	686	362	590	585	367	395
	2	755	655	426	336	559	615
	3	1162	1342	1210	1031	877	865
	4	745	744	538	542	780	340
	5	712	682	595	834	680	470
Subtotals		4060	3785	3359	3328	3263	2685
ONR	1	156	56	83	20	70	70
	2	187	176	109	106	130	130
	3	126	419	284	186	225	225
	4	-	18	-	24	10	10
	5	46	5	31	9	25	25
Subtotals		515	674	507	345	460	460
Other	1	75	0	52	134	65	65
	2	70	178	26	67	123	123
	3	325	226	452	503	340	340
	4	90	101	116	30	67	67
	5	419	365	300	348	373	373
Subtotals		979	870	946	1082	968	968
All	1	917	418	725	739	502	530
	2	1012	1009	561	509	812	868
	3	1613	1987	1946	1720	1442	1430
	4	835	863	654	596	857	417
	5	1177	1052	926	1191	1078	868
Totals		5554	5329	4812	4755	4691	4113

Notes: (1) Use-days for 1978-1981 derived from UNOLS data tables showing individual sponsor use-days for each ship in the NSF-supported academic fleet.

(2) CY1982 use-day estimates for NSF provided by OCE/OFS; for ONR and other sponsors, CY1982 use-days assumed equal to CY1983 projected use-days.

(3) See preceding text and TABLES 2, 3 and 5 for CY1983 projections.

(4) CY1983 projected NSF use-days based on -12% decrement budget level for OCE in TABLE 2 plus DPP and OSOD projections in TABLE 3.

*Adapted from "Projected Ship Needs for Ocean Science Research, 1983-1988," contained in Appendix I of the July 20 report.

**The NSF classification of the vessels in the UNOLS fleet is documented in the report cited above (*).

TABLE 2c. COMPARISON OF AVAILABLE AND PROJECTED USE-DAYS FOR CY 1983*

NSF Class	Ave Use-Days Per Year	# Ships	Available Use-Days	TABLE 6 Projected Use-Days	Transit Time Factor	Adjusted Projected Use-Days	Excess Use-Days Projecte
1	260	3	780	530	10%	583	197
2	260	3	780	868	10%	955	-175
3	240	7	1680	1430	5%	1502	178
4	220	5	1100	417	0%	417	683
5	200	7	1400	868	0%	868	532
		25	5740	4113		4325	1415

Notes:

(1) Class-1 useage in 1983 may represent an anomaly as suggested by projected increases in 1984 and beyond for physical, chemical, and polar oceanographic work.

(2) Conversion of a class-1 ship into an ALVIN tender is in progress and will significantly affect the availability of shiptime in this class.

(3) Additional shiptime needs projected for class-2 ships may be accomodated by use of class-1 and class-3 ships plus some amount of queuing.

(4) Underestimates of projected use-days for class-4 and-5 ships are likely for several reasons including:

a. Lack of experience with the new coastal ships.

b. Difficulties in projecting the numerous short duration cruises for which these ships are frequently used.

c. Greater proportion of use by sponsors other than NSF and ONR for class-5 ships.

d. Use by other sponsors frequently develops after NSF and ONR needs have been projected and scheduled.

*Adapted from Table 7 of NSF study entitled "Projected Ship Needs for Ocean Science Research, 1983-1988," contained in Appendix I of the July 20 report.

science projected for 1984 and immediately beyond. This opinion is based upon information in the NAS-OSB study "Academic Research Vessels, 1985-1990", the NSF Task Group Document "Projected ship needs for Ocean Sciences Research, 1983-1988", UNOLS data on vessel utilization since 1974 and input from the operating institutions. However, this condition may change and will require careful re-examination in 1983. Accordingly, the Advisory Council recommends:

2. *The number of Class C vessels should be reduced from eight to six starting in Calendar Year 1984.*

Of the four Class D vessels, the Advisory Council concludes that all are essential to meet currently funded science needs and that the vessels should be distributed as they are at present. They serve the East, Gulf, Southwest and Alaskan coasts. It should be noted, however, that immediate steps are necessary to replace one of these vessels, the oldest ship in the fleet, if these needs are to be met beyond 1985. The Advisory Council recommends:

3. *The number of Class D vessels should remain at four.*

While the Advisory Council recognizes the special ability of the Class E ships, we believe that the best way to retain their capabilities is to place them and the Class F ships under a new management scheme. We recommend that:

4. *Class E and Class F ships should be removed from funding on OFS ship operating proposals and be funded on a project-by-project basis.*

We further recommend that the portion of the OFS budget currently allocated (around $2.0 million or 10% of the NSF/OFS ship operations budget of $22 million) continue to be set aside within OFS to fund small vessel time requested in proposals. These funds should be allocated by OFS in consultation with the science program managers who should recognize the special needs and extensive use of these vessels, particularly by biological oceanographers. We make detailed recommendations concerning the mechanisms for management of this new fund in Chapter Three.

In summary, the Advisory Council recommends that given the currently projected funding for science, the minimum UNOLS fleet for 1984 consist of fifteen surface vessels: two Class A, three Class B, six Class C and four Class D. The composition and distribution of the minimum fleet are outlined in Table 2d, and are discussed in Chapter Three. The costs of all vessels, whether or not they are funded on a project-by-project basis, should be clearly stated in all proposals.

Table 2d.

THE MINIMUM UNOLS FLEET

	SHIP	RECOMMENDED OPERATING INSTITUTION
CLASS A	KNORR	Woods Hole Oceanographic Institution
	THOMPSON	University of Washington
CLASS B	ATLANTIS II	Woods Hole Oceanographic Institution
	CONRAD	Lamont-Doherty Geological Observatory
	WASHINGTON	Scripps Institution of Oceanography
CLASS C	ENDEAVOR	University of Rhode Island
	GYRE	Texas A & M University
	ISELIN	University of Hawaii
	NEW HORIZON	Scripps Institution of Oceanography
	OCEANUS	Woods Hole Oceanographic Institution
	WECOMA	Oregon State University
CLASS D	ALPHA HELIX	University of Alaska
	CAPE FLORIDA	University of Miami
	CAPE HATTERAS	Duke University/University of North Carolina
	VELERO IV	University of Southern California

Estimates of the full annual operating costs for this fleet are given in Figures 3.1, 3.2 and 3.3 and Tables 3a., 3b., 3c., and 3d.

CHAPTER THREE

RECOMMENDATIONS FOR UNOLS

FLEET COMPOSITIONS AND DISTRIBUTION

INTRODUCTION

In the report of its July workshop the Advisory Council considered three scenarios. One contained a minimum fleet of 15 vessels (3 Class A, 3 Class B, 6 Class C and 3 Class D) distributed among 11 operating institutions. A second consolidated the same 15 vessels among 6 operating institutions, 4 of which were to be controlled by regional consortia. The third encompassed a fleet of 16 to 17 vessels, operated either by regional consortia or their present operators, with a rotating pattern of layups among the Class A ships.

After careful examination of written responses from the UNOLS community, personal presentations from 12 institutions and a detailed re-examination of past and projected ship use patterns, the Advisory Council re-addressed its charge from NSF and ONR. A key element in framing the Council's draft final recommendations was re-assessment of the boundary conditions concerning ship utilization, namely, comparisons of past and projected patterns of actual use and ship availability. Some consistent patterns appeared in these comparisons (see Figures 3.1, 3.2, and 3.3) which led to our recommendations concerning the minimum fleet and to the class-specific recommendations described below.

Another important element influencing the Council's decision was our recognition of the importance of maintaining bonds between the ship users and ship operations. The Advisory Council is in complete agreement with the statement of the NAS-OSB Fleet Study:

> *"Thus, it remains of prime importance that we continue the type of operation which does not separate the sea-going oceanographers from the responsibility for management of research vessels. This should be maintained regardless of budget levels."*

The previous scenarios all suffered from the effect of decoupling a significant fraction of sea-going scientists from close interaction with the operation and facilities of their vessels. The Council firmly believes that the UNOLS concept not only works, but that it works very well, and that a critical aspect of this successful process is the diversity and community-wide interaction derived from maintaining the maximum number of effective ship operating institutions. Factored into this relationship, however, is the concept that the ships, while they are invaluable resources themselves, are but the means to an end.

CLASS SPECIFIC RECOMMENDATIONS

Classes A and B

The large and overlapping capabilities of vessels in these classes leads to their simultaneous consideration in this report. Large vessels with special capabilities (Class B) can also be effective as general purpose vessels in some cases, provided that their decks and labs can be cleared of specialized gear when it is not in use. The special capabilities of the Class B vessels have been recently added in direct response to demonstrable scientific needs. Therefore, it seems likely that the vessels carrying these capabilities will be in strong demand in the near future. Analysis of data on actual and projected use of Class A and B vessels (Figure 3.1 and Table 3a) demonstrates that an excess of ship availability has existed since 1979 and that five vessels can probably accommodate the funded scientific projects requiring such vessels in the near future. Therefore, the Advisory Council reluctantly recommends the reduction of Class A by one ship after 1983, unless major new scientific initiatives are funded that will result in excessive scientific queuing for the use of Class A and B vessels in 1984 and beyond.

We so recommend because:

1) This retirement will return a large fund to NSF for scientific research and better operation of remaining vessels.

2) Class B vessels will probably be fully scheduled for the next few years because of their special capabilities.

3) Modest queuing for the large, most capable facilities, is appropriate in times of funding stricture. This will be tolerable with 5 Class A and B ships unless new scientific initiatives are funded.

4) Since 1980, five ships in these classes have met the needs of funded science. Therefore, five ships (less time devoted to ALVIN use) may be sufficient, if scientific funding levels remain consistently low.

5) One Class A vessel should be retained on each coast.

On the basis of information available in August, 1982 (Figure 3.1, Table 3a), the Advisory Council tentatively recommends retirement of R/V MELVILLE.

The reasons for this choice are:

1) Consistent difficulty in keeping MELVILLE fully scheduled in the past.

2) Past propulsion difficulties.

3) MELVILLE is one of the most expensive ships in Classes A and B. Its retirement would free $3.0 million in 1984 for other uses.

This tentative recommendation is for a major change in the UNOLS fleet. It should be reviewed by the Advisory Council again by May of 1983 in the light of actual 1982 and 1983 operations of all ships in Classes A and B and

Figure 3.1
Available and actual days for class A and B ships

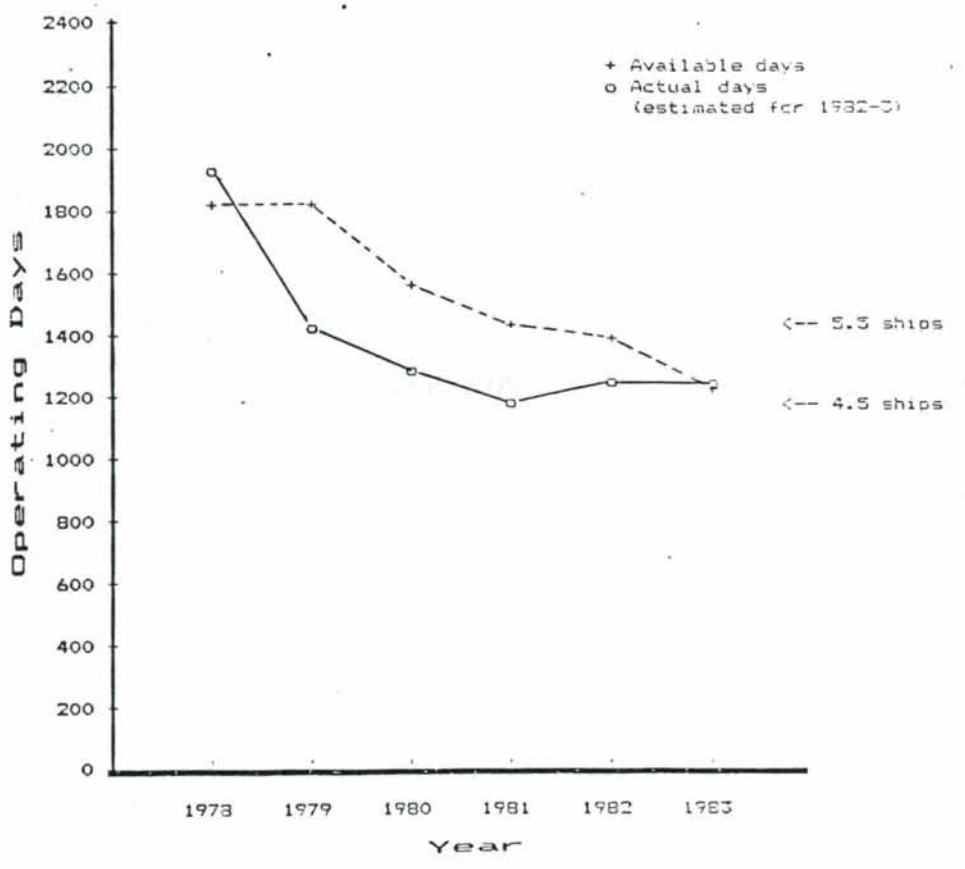

Table 3a. Operating days for class A and B vessels

	1978	1979	1980	1981	1982	1983	1984
Actual days	1925	1427	1240	1130	1243	1242	
Available days	1820	1820	1780	1430	1387	1320	1170/1430
Vessels							
Atlantis II	+	#	+	+	+	#	#
Conrad	+	+	+	#	+	+	+
Thompson	+	+	+	+	+	#	+
Melville	+	+	+	+	+	+	+/-
Knorr	+	+	+	+	+	+	+
Washington	+	+	+	+	+	+	+
Gillis	+	+	-	-	-	-	-

Notes : 1. Actual days for 1978, 1979, 1980 and 1981 are from UNOLS statistics provided by the operating institutions. The figure for 1982 is a projection from the same sources. The 1983 figure is a best guess estimate based upon the the science known or likely to be funded at the UNOLS May 23 1982 scheduling meeting. Current ship operating proposals (June 30 1982) carry a total of 1351 days for 1983 but this projection is rarely realized.

2. Available days are based upon a full operating ship year of 260 days. The definitions of full operating years are those used by the NSF Task Group . The available days for 1984 reflect the Advisory Council's recommendations.

3. Legend : + Vessel available for full year.
- Vessel retired and out of service.
Vessel available for part year due to scheduled refit or maintenance. In 1983 and beyond the conversion of Atlantis II for alvin support will reduce the availability to at least 1.2.

better estimates of funding and usage for 1984 and beyond. The 1983 review will include consideration of the retirement of THOMPSON and the possible transfer of another A or B ship to the University of Washington. Such a review may, in fact, indicate demand for all six of these vessels in order to maintain a healthy U.S. program in oceanography. Anticipated possible sources for increased utilization of large vessels include ONR Special Research Opportunity funds.

After this 1983 review, a firm recommendation will be made as to whether an A or B class vessel must be retired and specifically which vessel, the MELVILLE, the THOMPSON or one of the others.

The present complement of special capability large vessels (Class B) is sufficient to meet the projected scientific needs in the near future. The SEA BEAM systems in the WASHINGTON and proposed for the CONRAD and ATLANTIS II are currently of major importance to the Geology and Geophysics community but future uses by biologists, chemists and physical oceanographers may grow. The backlog of high quality Geology and Geophysics projects that can use these tools is sufficient to keep demand high until possible use by other disciplines increases. The multi-channel seismic (MCS) capabilities of the CONRAD and WASHINGTON are essential tools for modern geophysics. While it is unlikely that MCS programs will fully utilize either ship, the additional work of SEA BEAM, single channel digital seismic systems, and general work should keep ship utilization at high levels into the predictable future. The conversion of ATLANTIS II to a support vessel for the DSRV ALVIN has been proposed and has been strongly endorsed by the Advisory Council and the ALVIN Review Committee. The increased range and endurance that would be afforded to submersible operations opens up new possibilities for important ocean science projects.

Further, the changes made while adding special capabilities to ATLANTIS II, CONRAD and WASHINGTON have in no way decreased their ability to conduct some other types of ocean science. In fact, ATLANTIS II's low speed maneuvering and lift capacity will be substantially enhanced. If funded use of these vessels' special capabilities should not be realized as projected or should wane after an initial pulse, all Class B vessels have the potential to serve as excellent general purpose vessels comparable to those in Class A, provided that the large, specialized deck hardware is removed when not in use.

Data available to the Advisory Council in August, 1982 indicate that funding for MCS work is unlikely to exceed two to three months per year. The reduction of the Class A and B vessels to five dictates that the schedules of neither WASHINGTON nor CONRAD must be dominated by MCS requirements. Rather these requirements should compete with other disciplines in the scheduling of either ship. Decisions on such scheduling priorities could be part of a national expedition scheduling process described in Chapter Four.

Class C

Class C consists at present of seven ships, an eighth will return to the fleet in 1984. Our analysis of recent use data (Figure 3.2 and Table 3b) shows consistent demand for the available use-days of seven vessels in this class through 1981. However, demand in 1982 and that projected for 1983 amounts to full operation of only six Class C ships. The newer ships in this class (NEW HORIZON, ENDEAVOR, OCEANUS and WECOMA) are all in heavy demand. They should all be retained and continue to operate at their present institutions.

In order to reduce the excess capacity, we recommend that ISELIN be transferred to the University of Hawaii following retirement of both KANA KEOKI and MOANA WAVE. KANA KEOKI is old and continued service would be marginal. The Advisory Council is not convinced MOANA WAVE should be refit after the severe modification for NAVELEX use. Refit must include 1) regearing; 2) removal of acoustical isolation of engines; 3) shaft alignment; 4) propeller replacement; 5) dewarping of the hull, and 6) reconstruction of the superstructure after antenna and paravane removal. The return of a "stretched" MOANA WAVE to the UNOLS fleet, as proposed by the University of Hawaii, to replace the KANA KEOKI would have many benefits. However, in view of the current funding climate and the excess of vessels in the fleet, the Advisory Council believes that these benefits must be carefully weighed against the costs of the proposed conversion.

Our reasons for recommending transfer of ISELIN are:

1) ISELIN is capable and newly refit. She should be retained if possible.

2) Miami had a weak record through the late 1970'S in the quality of ISELIN operation, although commitment to better service is evident.

3) Demand for ISELIN operating from her Florida base has been weak in recent years. She operated only 207 days in 1981 and is laid up in 1982.

4) The southeast sector has an excess of available days on Class C and D vessels taken together. Moving ISELIN will reduce this excess.

5) Miami is retained as operator of a major UNOLS ship, CAPE FLORIDA. No operating institution is dropped from UNOLS.

6) Minimum damage will be done to the ESPRIT D'CORPS of oceanographic institutions generally.

This recommendation is different from that of our first draft in which we proposed retiring GYRE and removing TAMU as an operator. We have moved from that position because we have been convinced by: 1) the argument that a Gulf of Mexico operator is needed; 2) the good record of GYRE operation; 3) the reaction of many unaffected members of the community. However, we feel that TAMU operation of GYRE needs some changes:

Figure 3.2
Available and actual days for class C ships

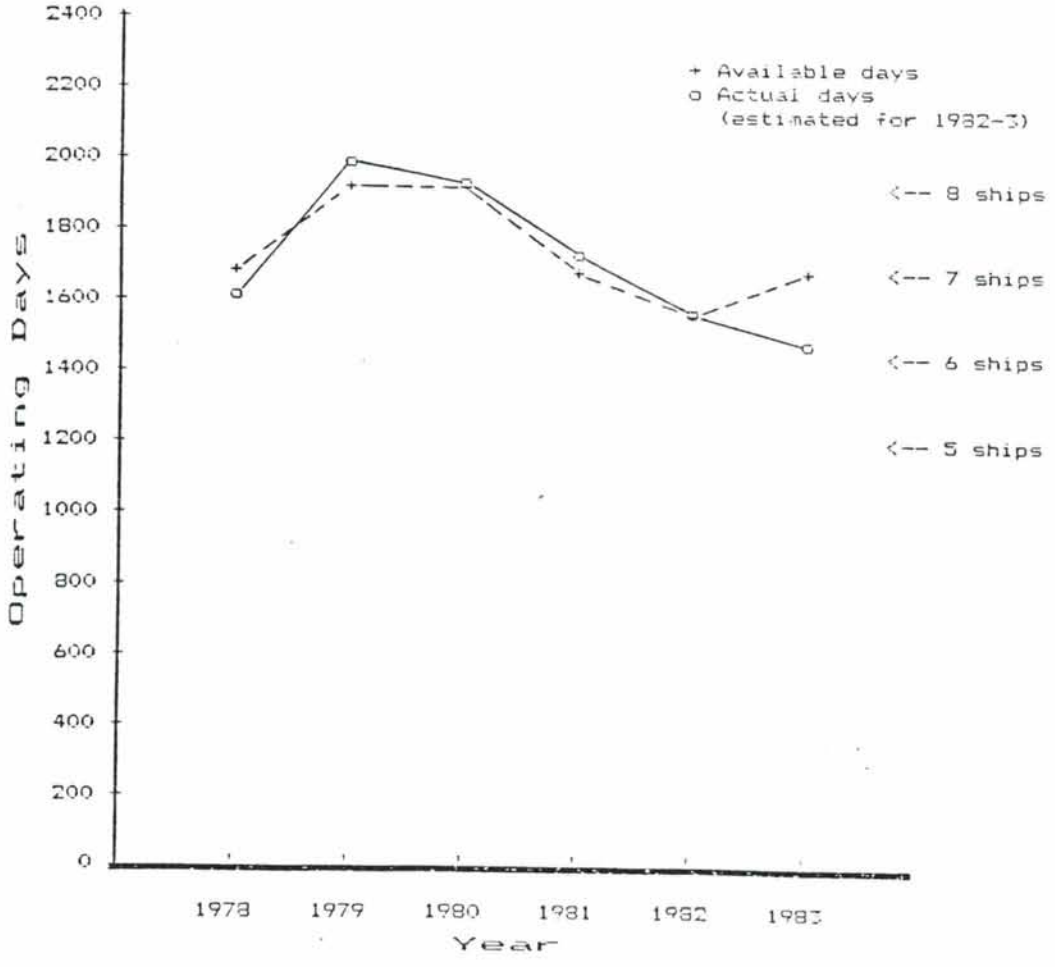

Table 3b. Operating days for class C vessels.

	1978	1979	1980	1981	1982	1983	1984
Actual days	1615	1990	1905	1738	1589	1481	
Available days	1680	1920	1920	1680	1560	1680	1440
Vessels							
Vema	+	+	-	-	-	-	-
Endeavor	+	+	+	+	+	+	-
Oceanus	+	+	+	+	+	+	+
Vidoma	+	+	+	+	+	-	-
Cyrus	+	-	+	+	+	-	-
C. Islin	+	+	+	+	+	+	+
New Horizon		-	-	+	+	-	-
Hans Hedtoft	+	+	+	+	+	+	-

Notes : 1. Actual days are determined as for class A and B vessels with the 1982 and 1983 figures as being projections.
2. Available days are based upon a full operating year of 240 days. The legend is the same as figure 3a.

1) Cooperation of TAMU and University of Texas must be established. It is wasteful of U.S. and State of Texas funds to operate three, partially active ships from Galveston at two separate marine facilities. We include the R/V FRED MOORE and R/V IDA GREEN in this "Galveston Fleet". Available data suggest the need for only one ship of their group for projected, federally-funded projects. We recommend that there be only one UNOLS operation in the Western Gulf (one shared ship and facility).

2) Faculty from Texas and the Western Gulf must begin actively to use the GYRE. Present use is minimal.

3) Since TAMU is retained largely to keep a Gulf operation in UNOLS, use of the vessel by Gulf scientists must be more emphasized in the GYRE schedule.

Class D

Class D includes four ships at present. This is a close match to demand from funded, scientific projects. The agreement is established by the data presented in Figure 3.3 and Table 3c. Therefore, the A/C recommends retention in the UNOLS fleet of all four, operated by their present institutions. We feel that none of the possible Class D ship transfers would produce benefits to justify the disruption they would entail.

VELERO IV is operating well at present, but it is old and its capability is becoming marginal. Current use is low but adequate for VELERO IV and a growth of marine science between Los Angeles and Cape Mendecino is projected. Thus, we recommend retirement and subsequent replacement of VELERO IV with a new ship by 1986. This option must be carefully evaluated by UNOLS and the funding agencies. The Advisory Council recognizes the potential need for a Class C vessel with greater range and heavy weather capabilities to replace VELERO IV, particularly if the MELVILLE is retired. However, current funding of ocean science is insufficient to justify an immediate recommendation for the upgrade to Class C capability for the region. The Council notes that preliminary steps have been taken by the California ship-using institutions to form a consortium for operation of a VELERO IV replacement. Continuation of CAYUSE at Moss Landing will fill some of this growing need as well. However, we recommend below (see Class E) that CAYUSE must change funding modes, drawing support from project funds. This means that demand will determine directly the importance and continuation of CAYUSE.

In recognition of the extant and growing need for coastal research vessel use in the northwest, the Advisory Council recommends that the ALPHA HELIX be deployed seasonally to meet these needs off Washington and Oregon.

After discussions with the Chesapeake Bay Institute and written input from several of her users we have reclassified the WARFIELD as a Class E vessel. The rather arbitrary criterion of length had been previously misapplied in this case when, in reality, a combination of factors such as displacement, endurance, and range should have been more heavily weighted in the classification process. The same factors also influenced the categorization of the CAPE HENLOPEN within Class E.

Figure 3.3
Available and actual days for class D ships

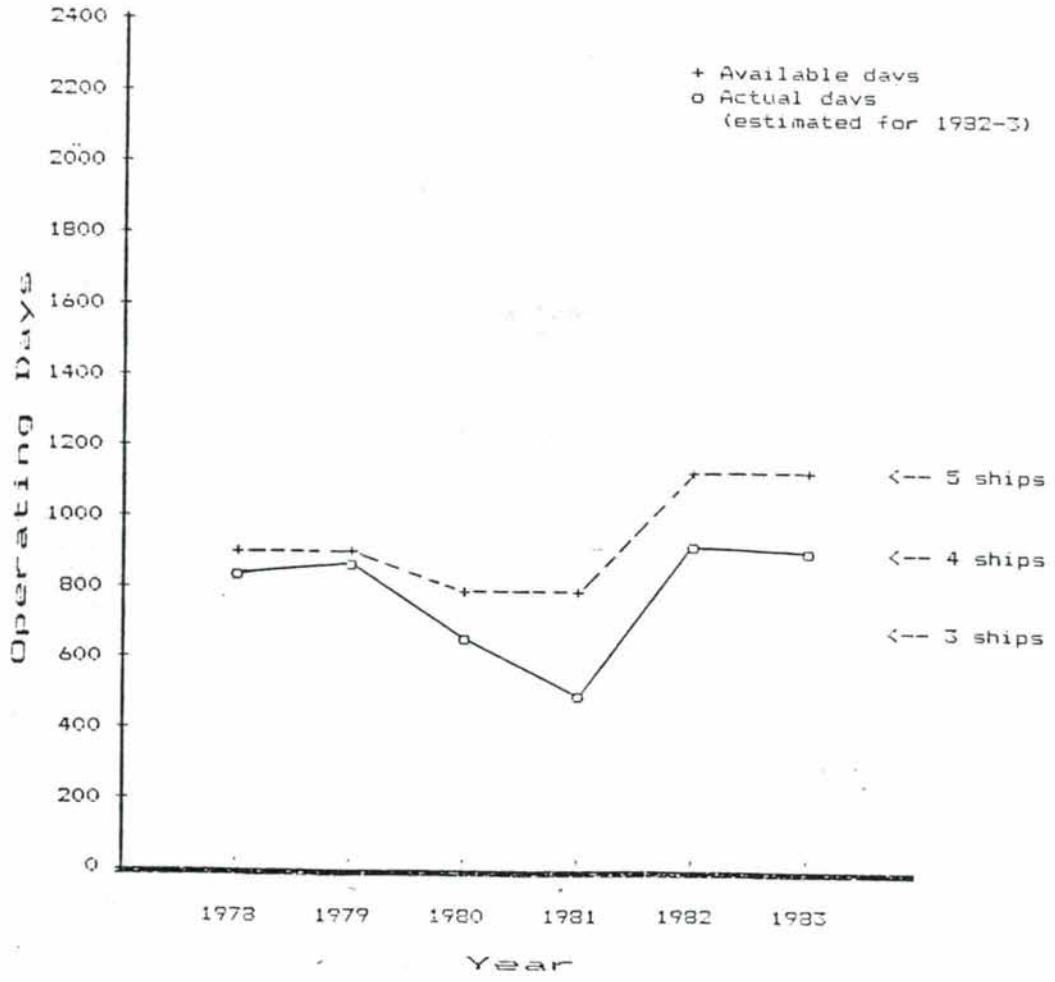

Table 3c. Operating days for class D vessels.

	1978	1979	1980	1981	1982	1983	1984
Actual days	835	863	654	491	922	904	
Available days	900	900	787	787	1125	1125	900
Vessels							
Alpha Helix	+	+	#	+	+	+	+
Eastward	+	+	+	–	–	–	–
Valero IV	+	+	+	+	+	+	+
Garfield	+	+	+	+	+	+	–
Cape Florida				#	+	–	+
Cape Hatteras					+	+	+

Notes : 1. Actual days determined as for figures 3a and 3b.
2. Available days are based upon a full operating year of 300 days.
The legend is the same as figure 3a.

Classes E and F

While recognizing the wide utility of the four Class E ships, the Advisory Council believes that their capabilities are best retained for NSF grantees by placing them, with the Class F ships, as a group to be funded on a project-by-project basis.

In recognition of the special status of Class E and F ships operated by UNOLS Members and Associate Members, and in response to the interest and commitment to academic oceanography exhibited by these institutions, we recommend that all such ships have access to a special pool of funds for the conduct of NSF-supported research. The Council believes that this federal support will encourage further investment from these institutions in these smaller vessels. The recommended pool of funds should be managed by OFS and granted specifically and non-transferably for the use of small ships not protected by regular, annual proposal funding by OFS. The funds should be contracted by NSF for ship use only, and funds not utilized would be returned to OFS. The current UNOLS fleet ships included in this process will be: CAYUSE, E. B. SCRIPPS, LONGHORN, BLUE FIN, HOH, ONAR, CALANUS, CAPE HENLOPEN, LAURENTIAN, and WARFIELD; all to be operated by their present operating institutions. The Council's earlier recommendation that CAYUSE be transferred to Washington was withdrawn after receipt of information from the two institutions involved. We now endorse her continued operation by Moss Landing.

In addition to the 10 ships in Classes E and F, the more than 60 ships currently operated by various UNOLS Member and Associate Member Institutions on a project funding basis would be eligible for funding through this mechanism. In order to be eligible for project funding, ships must meet the UNOLS Research Vessel Safety Standards, with operating insitutions providing appropriate certification to NSF.

The level of NSF/OFS funding currently supplied for these vessels should be retained to apply toward small vessel time requested in proposals. Thus funds from the pool, *together with NSF research project funds currently being devoted to ship operations*, should provide a consistent level of support for these classes of ships.

The Advisory Council recognizes that this recommendation represents no financial saving. However, we believe that this modified funding plan, coupled with other federal, state and private support for these ships will encourage institutional investment in them and provide an equitable mechanism through which all appropriate ships may receive funding from NSF.

We further recommend that approximately 10% of OFS ship funding be set aside for this pool. In FY 83 this would be approximately $2.0 Million. Allocations of these funds should be apportioned to the operating institutions either directly or through awards to the P.I.'s, but not as a part of their research budget. These recommendations are not meant to eliminate funding for small ships through other divisions of NSF, a practice that contributes to the strength of small boat operations around the nation. In administering these funds NSF should take explicit steps to assure that a *uniform* procedure is established for all ship operation funds disbursed through this pool funding mechanism. We recommend that NSF establish and publish guidelines for these procedures.

The initial effects of this plan on smaller institutions which may operate only a Class E or F ship such as Skidaway, CBI, and Moss Landing, may be more strongly felt than at institutions which also operate regularly funded ships. However, the Council believes that traditional patterns of use together with the proven effectiveness of the vessels operated by these institutions will result in a sustained level of utilization and support.

The Council recommends no procedural changes for E and F class ships with regard to support from NSF for ships' equipment and marine technician programs.

ECONOMIC IMPLICATIONS

The current UNOLS fleet, as listed in Table 2a, would require an estimated $33.8 M for a full operating schedule in CY 1982. Inclusion of ALVIN/LULU operations would bring the total CY 1982 costs to $35.8 M and of the MOANA WAVE to $37.4 M.

The minimum UNOLS fleet proposed for 1984, as listed in Table 2.2, would require $29.65 M (1982 dollars) to operate at full capacity (Table 3d). This figure includes $2.0 M for present funded Class E & F ships and $1.0 M for ALVIN.

TABLE 3d. COST ESTIMATES FOR THE MINIMUM OPERATING FLEET
(IN 1982 DOLLARS)

UNOLS Class	NSF Class	Vessel	Annual Operating Cost (in Millions of 1982 dollars)	Class Total
A	1	KNORR	$3.0	
	2	THOMPSON	2.2	
				5.5
B	2	CONRAD	2.2	
	2	WASHINGTON	2.5	
	1	ATLANTIS II	3.0	
				7.4
C	3	ENDEAVOR	1.6	
	3	OCEANUS	1.6	
	3	WECOMA	1.6	
	3	NEW HORIZON	1.6	
	3	ISELIN	1.6	
	3	GYRE	1.6	
				9.6
D	4	CAPE FLORIDA	1.2	
	4	CAPE HATTERAS	0.8	
	4	ALPHA HELIX	1.45	
	4	VELERO IV	0.7	
				4.15
E & F	4 & 5	POOL		2.0
ALVIN (ATLANTIS II support included above)				1.0
			Total	$29.65 M

Reference: NSF Task Group data.

CHAPTER FOUR

FLEET MANAGEMENT

The NSF/ONR charge to the Advisory Council included a request for specific recommendations on management of the UNOLS Fleet in the 1983-88 time frame.

Recommendations

In response to this charge, the Council recommends:

1. *Establish a minimum UNOLS Fleet of fifteen vessels in the Classes A-D defined in Chapter Two under a funding mechanism much like the present one and operated as outlined in Chapter Three. Operate all other vessels on a project funded basis, with costs specifically reported in proposals.*
2. *Establish a National Expeditionary Planning Process (NEPP) with responsibiliites for long lead time planning for the use of vessels.*
3. *Continue UNOLS' East-West regional scheduling process including scheduling information supplied from the National Expeditionary Planning Process.*
4. *Encourage the use of the least expensive scientifically and logistically appropriate ship by requiring that funds for needed ship time be explicitly stated in NSF proposals.*
5. *Any monetary savings derived from the reduction of the UNOLS fleet to fifteen vessels should be allocated first to the science programs and second to upgrading the capabilities of the remaining ships.*
6. *With the goal of increasing the cost-efficiency of ship operations throughout the fleet, the Advisory Council recommends:*
   a) *That we continue the present format for detailing costs and expenditures in NSF ship support proposals, but institutions must indicate where mandatory additional costs associated with technicians or equipment will be assessed to users.*

b) NSF should require that the ship operating institutions explain or eliminate the apparent differences in costs for similar ships.

c) In order to increase the exchange of information, all ship operating institutions should supply their ship support proposals to the UNOLS Secretary for circulation to other operators.

d) An expanded and more detailed exchange of information by ship operating institutions relative to ship costs.

7. Earlier projections of scientific project funding are essential in order to facilitate the development of efficient ship operating schedules.

Discussion

The minimum fleet and the mechanism for funding small ships has been discussed in Chapter Two.

In arriving at recommendations for funding mechanisms, the Advisory Council considered the potential benefits and detriments of funding Classes C and D ships on a competitive project-by-project basis.

Management difficulties associated with the crewing and efficient operation of larger vessels on a project basis lead us to reject such schemes. Because of the great relative expense of ships, sea-going oceanography will continue to require a dedicated fleet with guaranteed funding for ship operations in support of science. The nation must maintain a sea-going capability for academic science. For ships of Classes A through D we believe the most effective use is met by a funding mechanism much like the present one.

The Advisory Council also discussed alternatives to the funding protocol that underlies existing Ship Operation Support Proposals. In particular we examined the desirability of partitioning ship support costs into one portion that would be devoted to maintaining ships and shorebased marine facilities in a ready-for-research status with incremental added-cost funding for days devoted to research projects. Under such an alternative total costs for marine facilities and ships would no longer be apportioned strictly according to the distribution among sponsors of the price per operating day or day at sea. Rather, the costs for maintaining a given facility could be apportioned among funding sources on a yet-to-be- determined principal-user basis and the incremental daily use charge would be made to funding agencies according to use made of the facilities. We see advantages to the scheme in that it would help assure some level of support to operating institutions and allow them to market their ships and facilities more effectively than at present. We believe that this might promote greater use of ships in the UNOLS fleet and thereby reduce total costs to the principal funding agencies (NSF and ONR).

At the same time we recognize that NSF, ONR and other agencies supporting oceanographic research and ship operations do so under strictures of public accountability and interagency relationships. Nevertheless, the Council recommends that NSF and ONR investigate the potential for alternate funding schemes and the practicality of implementing beneficial alternatives. Further, the agencies and UNOLS should consider the potential benefits and problems of a single 'lead agency' for the academic fleet.

The Advisory Council feels strongly that effective management of the academic research fleet requires more rigorous advanced planning than has been displayed in the past. The need for effective advanced planning is made more critical by today's climate of budget restrictions and the consequent need to balance fleet and facility support within the overall ocean research program. The minimum UNOLS fleet recommended herein, with or without a reduction in Class A and C ships will make it much more difficult to provide the ship time necessary to achieve acceptable progress in ocean science, to satisfy the legitimate requirements of ocean program managers and principal investigators. Further, UNOLS ship operators must have a better projection of program funding in order to conduct operations effectively and schedule their ships efficiently.

The Council finds the need for planning most pressing for those programs that are global or expeditionary in nature. The success of these projects requires the firm commitment of UNOLS' broad-capability (Classes A and B) ships, long term investments by investigators and by project managers and complex formulation and coordination of scientific programs.

Accordingly, the Advisory Council recommends that *the current UNOLS scheduling procedures be enhanced to include a national expeditionary planning process. The objective of this planning process would be:*

To establish a three year planning process that will produce, by the May Semi-Annual Meeting, firm schedules for ships in the UNOLS fleet for the subsequent operating year. These schedules must be based on approved projects, 70-80% of which are firmly funded.

A UNOLS Scheduling Committee (USC) would be established to implement this national planning process in coordination with representatives of funding agency and UNOLS operating institutions, in concert with existing scheduling procedures.

Three years in advance of the operating year the USC would, through solicitations to and letters of intent from principal investigators and program managers, identify prospective principal operating areas, outline expedition plans and identify overall ship requirements for national programs and remote expeditions. These tentative plans would be distributed throughout the oceanographic community thereby providing early alert to potential investigators, program managers and operators. This process would consider

all ships in Classes A and B, together with those ships in Classes C and D that might participate in national, global or remote programs.

Starting two years before the operating year, the funding agencies would solicit proposals to be submitted concurrently to the USC. The committee, together with agency representatives, would consider these proposals and develop information and recommendations that would be included in the UNOLS East-West Fleet scheduling process approximately one year in advance of the ship operating year.

Starting one year before the operating year the East and West Coast Scheduling groups would work to establish ship schedules for all classes of vessels, based on information provided by the USC, all ship operating institutions, the UNOLS Office and funding agencies. These schedules would be presented at the May semi-annual meeting for UNOLS endorsement, and would be the basis for Ship Operations Support proposals submitted in July.

The ALVIN Review Committee would continue to perform the function of detailed consideration of deep-submersible science proposals and coordinate at a timely rate the proposed scheduling of the ATLANTIS II/ALVIN with the USC.

The Advisory Council recognizes that this recommended planning process will necessarily impinge on that system flexibility which now allows the submission and funding of proposals only a few months in advance of seagoing operations. It will require an earlier submission of proposals, expecially those requiring the use of the larger, more expensive ships. It will result in the reservation of a significant portion of program funding and ship time for programs developed through the advanced planning. The Council acknowledges the need for retaining a level of scheduling flexibility to accomodate unique and short lead time research opportunities and short-term schedule adjustments.

Further, great care must be exercised in conducting this planning process such that the science proposed and funded is not unduly influenced or dictated by ship scheduling. We submit, however, that the success of the ALVIN Review Committee in fostering interest in and scheduling a strong program is evidence that advance planning can work well without negative impact on the thrust and creativity of research.

The constraints introduced with this planning process will, the Council believes, be more than offset by the gains in efficient, effective fleet management. Class A (KNORR, MELVILLE AND THOMPSON) and Class B (ATLANTIS II/ ALVIN, CONRAD AND WASHINGTON) vessels are at the same time, the core of our nation's expeditionary and global capability for the support of ocean sciences and the most expensive of our facilities to operate. While the Advisory Council believes that these ships are essential to critical aspects of ocean science and that none can be removed without far reaching effects, neither can they be maintained and operated in cost inefficient, low demand circumstances. As science funding continues to be scarce, variations in the year-to-year demand may occur. Only with effective advanced planning can the effects of these variations be accommodated; on the one hand by scheduling, perhaps even queuing, major programs to minimize the variations and at the same time by accommodating temporary vessel layups related to vessel modification, refit and phased replacement. Such future layups from the

minimum fleet should be undertaken with the clear understanding that the vessel will be replaced or returned to the fleet. They must also be planned so that they will achieve the maximum savings. This requires adequate advanced notice of a layup (at least six months for a large ship), relatively few, somewhat longer layups in preference to many shorter ones and the incorporation of time for modifications, refit and periodic ship maintenance into the layup period. With careful planning layups of about a year's duration can save as much as 80% of the ship's annual operating costs.

Earlier planning of major expeditions has the added advantage of placing the scheduling of UNOLS vessels in a time frame that would allow joint scheduling and the temporary exchange of appropriate ship time and facilities with other nations, e.g., United Kingdom, France, West Germany.

The Council notes that the benefits to be gained through this recommended planning process cannot be realized without a means for reserving funds for major programs more than a year in advance and without commitment of funds for projects requiring ship time months earlier than is presently made. The Council recommends that 70-80% of the funding for Class A and B vessels be committed by January of the year before the operating year and for class C and D vessels by May of the year before the operating year. This is necessary if scheduling groups are to achieve a firm schedule by May. Further, if operating institutions are to submit their ship support proposals by July 1, then June 1 should be the deadline for NSF decisions on nearly all science proposals requiring ship time the following year. This would, of course, require adjustments in NSF and ONR proposal deadlines and review schedules. Most proposals requiring sea time would have to be submitted by February of the year prior to that of ship use.

We cannot emphasize too strongly that efficiency in the use of federal funds for ship operations requires that funding commitments be made on a schedule comparable to that recommended.

The proposed organization would have the UNOLS Scheduling Committee with the following members:

Chairman - Selected from the community at large. (Elected by UNOLS members to hold three year renewable term).

Chairman of the East Coast Scheduling Group. (Appointed by UNOLS Chairman on recommendation from members of East Coast Scheduling Group for an indefinite term).

Chairman of the West Coast Scheduling Group. (Appointed by UNOLS Chairman on recommendation from members of West Coast Scheduling Group for an indefinite term).

Four representatives, one from each of the Institutions operating Class A and B vessels. (Appointed by the Institutions for an indefinite term).

Chairman of the ALVIN Review Committee. (Election and term unchanged).

One UNOLS Advisory Council Member. (Appointed by Chairman of the Advisory Council for a two year, renewable term).

UNOLS Executive Secretary (Ex-officio)

The East and West Coast Scheduling Groups would continue with their present operating procedures, with membership from all operating institutions.

In line with the NAS-OSB Fleet Study, the Advisory Council recommends *that ship time, its estimated cost, and the name of the requested research vessel should be presented in all research proposals which call for the utilization of NSF funded (UNOLS) ships.* This information should appear on the proposal cover page, budget page and NSF Form 831 so that the information is clear to the reviewers. However, it should not be included as part of the total budget figure. Instead it should be presented as a separate item labeled "Ship Costs", independent of project costs. This reporting of ships costs in proposals should apply to all vessels. Justification for ship utilization should be included in the body of the proposal. Toward this end, we further recommend *that the ship operating institutions provide each P.I. with consistent and comparable data sets for reporting ship cost estimates.*

Fleet requirements change with time in response to the science as well as to changes in national priorities and resources. Many of the problems associated with the current Advisory Council Review could have been mitigated or removed by periodic critical assessments of the fleet.

Accordingly, the Advisory Council recommends *that future Councils undertake regular in-depth reviews of the fleet composition and utilization at intervals of three years and report their findings to the community and to the funding agencies.* Adoption of the cost reporting processes advocated earlier in this section will greatly facilitate this procedure.

APPENDIX I

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

July 27, 1982

Dear Colleague:

You will have recently received a copy of a preliminary report of the Advisory Council on the UNOLS Fleet Composition and Management. This letter solicits your response to the issues addressed in that report.

The final report, to be written following the Advisory Council Meeting on August 18 - 20, must include a reasonably complete analysis of the effects of any proposed changes in fleet composition and management. It can do so only with your help. Please be aware that it is as important to state your concurrence with any of the positions or issues as it is to provide dissenting views, criticism and possible alternate scenarios.

I wish to reiterate the invitation from Bruce Robison that in addition to a written response, the Advisory Council would welcome your personal presentation on August 18 in Boulder, Colorado.

Please send all responses and notice of your intent to attend the Advisory Council Meeting to:

Captain William D. Barbee
UNOLS Executive Secretary
UNOLS Office WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Yours sincerely,

Derek W. Spencer
Chairman

DWS/ban

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

July 20, 1982

Dear Colleague:

The appended document is the result of the Advisory Council's July 8 and 9 meeting, where at the request of NSF and ONR, we addressed the problems of fleet composition, distribution and management for the period 1983-1988. This document is a preliminary report of our recommendations, based on the projected funding levels for sea-going science, the projected scientific requirements for specific types of vessels, and a variety of input material which is detailed in the text of the report. It is at present only a draft of the recommendations we intend to submit to NSF and ONR. We are distributing it to you in order that we may solicit and stimulate responses, so that the final report will accurately reflect the concensus of the UNOLS community. We urge you to carefully consider this report and to discuss its implications with all of your ship users.

We also urge you to provide further written input to the Advisory Council by sending it to the UNOLS Executive Secretary:

Captain William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Our next (and last) meeting will be held in Boulder, Colorado on August 18, 19 and 20. We have expanded the meeting from two days to three so that we might allow those of you who wish to, to make individual, personal presentations on these issues to the Council. If you wish to join us in Boulder on the 18th, please inform Bill Barbee soon, so that we may work out a schedule. On the 19th and 20th, the Council will work with the then available information to frame a final report.

It is likely that the recommendations in the final report will have a significant influence on subsequent decisions by NSF and ONR with regard to the UNOLS fleet and thus on sea-going science in the future. Accordingly, we again ask you to carefully consider and discuss this preliminary report and then provide us with your criticisms, comments and/or alternative suggestions.

Sincerely,

fr. Bruce H. Robison

Bruce H. Robison
Chairman, Advisory Council

BHR/ban
attachments

CHAPTER I

UNOLS ADVISORY COUNCIL
REPORT OF UNOLS FLEET WORKSHOP
JULY 8-9, 1982

Introduction

On May 23, 1982 the Advisory Council accepted a charge from the National Science Foundation, agreed to by the Office of Naval Research, to:

> "develop specific recommendations on a ship-by-ship basis for the composition, distribution and management of the UNOLS fleet in the 1983-1988 time frame."

This charge, background information, and the planned response of the Advisory Council to meeting the charge was described in a June 14, 1982 letter from Derek Spencer to UNOLS Members and Associate Members. (Appendix 1) The present report is part of the Council's approach to its charge and is described on page three of Dr. Spencer's letter. The report describes the Advisory Council's assessment of material available for its consideration, criteria for ship retention, scenarios for bringing fleet composition into line with the needs of projected federally funded academic ocean science research and critiques of those scenarios.

I. Assessment of Input Material

The Advisory Council was provided with items described on page five of Dr. Spencer's letter of June 14 and received specific input from the following UNOLS Members: University of Miami, Woods Hole Oceanographic Institution, Scripps Institution of Oceanography, University of Alaska, University of Washington, Texas A & M University, Lamont Doherty Geological Observatory, University of Rhode Island, University of Southern California, University of Hawaii and the University of Texas.

Several materials available to the Advisory Council were useful as background information. In particular, the National Academy of Sciences' Ocean Sciences Board Fleet Study, "Academic Research Vessels, 1985-1990" and background material from NSF and ONR program officers were convincing that modern United States academic ocean science is vibrant with the approachs, techniques and the intellectual capability needed to answer important and exciting practical and scientific questions about the world's oceans and their processes. The National Academy of Sciences' committee and the NSF program managers agree that projected funding for U.S. academic ocean sciences will be inadequate to support all intellectually worthwhile science. They also agree that the current academic fleet will have to contract if ship and science funding is to be appropriately balanced. The NAS report suggests that an 18% excess capacity exists in the overall 1981 UNOLS fleet and the NSF program managers project significant excess capacity (40-60%) in the smallest two classes of UNOLS vessels in 1983. However, the program managers note

that the 1983 use of these vessels may have been underestimated The Advisory Council also considers that the projections are underestimated. Existing 1983 schedules for the 100-149 foot class obtained from UNOLS Members project more than twice as many days of use as the NSF program managers forecast for 1983. Ship use projections are notoriously imprecise, as evidenced by the 60-70% variation between projections for 1981 use of the two smallest classes of UNOLS vessels made by NSF staff in May 1979 and actual 1981 use as described in NSF proposal and UNOLS data in December 1981. Analysis of historical ship use data from 1973-1980 also shows wide variations in the use of different vessels from one year to the next. This widely recognized imprecision in ship use projections gave the committee grave reservations about reaching irreversable decisions based on such projections. These reservations explain why the scenarios described later in this report are consciously designed to allow for relatively flexible response in balancing vessel availability with scientific needs. This flexibility includes attempts to retain large vessels that can carry out both large and small scale scientific needs, recommendation of a flexible funding process to support oceanographic field research platforms not now, nor recommended to be included in the 1983-85 UNOLS fleet, a recommendation to retain the balance between general purpose and special capability vessels that is currently planned for 1983, and a recommendation that new or additional constraints on vessel funding be accommodated by layups dovetailed with yard or refit periods rather than by decommissioning additional vessels. These methods for developing flexible responses to projected funding inadequacies were used to establish boundary conditions for the minimum fleet needed to meet projected funded science needs in 1983.

II. Criteria for Ship Retention

The Advisory Council read and discussed a document entitled "Criteria for Assessing Ship Retention Value" provided by the NSF Ocean Sciences Division as well as relevant portions of the NAS report on "Academic Research Vessels, 1985-1990" (primarily chapters IV and V). The council agreed that the NSF document contained all appropriate criteria and was wise in refraining from recommending mechanical application of any single criterion or system of criteria. The Council's discussions identified the obvious need to weigh different factors differently in assessing the value of retaining different vessels as part of the UNOLS fleet. For example, the Council found the criteria of regional importance to dominate discussion of retaining UNOLS vessel capabilities in Alaska and Hawaii whereas use by NSF and ONR grantees and contractors as well as institutional use were more critical in assessing retention value of vessels from areas more copiously supplied with UNOLS facilities. The NSF document "Criteria for Assessing Ship Retention Value" is included as Appendix 2 of this report.

CHAPTER TWO

THE UNOLS FLEET

The National Academy of Sciences Ocean Science Board Fleet Study and the NSF/ONR Task Force Report classify the vessels in the UNOLS Fleet by size. While this is useful for funding comparisons, the Advisory Council, in approaching the task of defining a minimum fleet to meet currently funded science, decided to consider capability and function to establish classes of vessels. While size is correlated with these characteristics, it is the capability and function of the vessel that determine its effectiveness as a tool of ocean science.

We consider that the current UNOLS fleet may be functionally grouped into six classes.

Class A. Large vessels, with extended range and endurance, with berthing for twenty or more scientists and sufficient laboratory and storage space and equipped to meet the diverse needs of multiple scientific objectives.

Class B. Large vessels equipped with facilities to perform special tasks whose schedules are largely determined by the science needing those tasks. These vessels also have extended range and endurance and, in addition, they have the capabilities of accommodating some general purpose operations.

Class C. Intermediate vessels with moderate range and endurance and with berthing for about fifteen scientists. These vessels, while possessing the capability of performing some trans-oceanic cruises, are limited by berthing, storage, lab space and sea-keeping from performing efficient multipurpose extended expeditionary work. They are efficient and cost effective alternatives to the Class A vessels for regional shorter range multipurpose tasks and for extended range single purpose tasks.

Class D. Coastal, general purpose vessels, greater than 100 feet, of limited range and endurance with berthing for about twelve scientists. These vessels are equipped for deep sea operations and have modest laboratory and storage space that are sufficient to meet the needs of coastal and continental shelf programs.

Class E. Coastal, general purpose vessels, less than 100 feet, with ten or less scientific berths that are crewed for cruises of several days extent.

Class F. Coastal, general purpose vessels, less than 100 feet, with berthing for ten or less scientists. These vessels carry minimum crews and are generally unsuited for other than short overnight cruises or on station activities of several days in clement regions.

The UNOLS vessels currently in these classes are listed in Table 2.1. We assume that the conversion of the R/V ATLANTIS II to become a tender for the DSRV ALVIN will proceed during 1983.

A Minimum Fleet

As stated earlier, the Advisory Council concurs with the OSB and the NSF-ONR Task Force that the current UNOLS fleet has a capacity that is in excess of the currently funded science needs. The decline of funding for ocean science is not a recent phenomenon and the UNOLS fleet has reduced from a maximum of thirty-five vessels in 1971 to the present twenty-six. A large percentage drop (20%, from 8 to 6) has occurred in the vessels greater than 200 feet. However, the recent installation of special facilities on three of the six remaining large vessels has effectively reduced the current availability of large vessels for general purpose operations to about four (three plus 1/3 time on each of three specialized vessels.)

The Advisory Council is convinced that the present complement of the equivalent of four large, general purpose vessels is the minimum that can meet the needs of ocean science, now and in the near future. The special equipment provided by the high resolution echosounding capabilities aboard the R/V's T. WASHINGTON (and soon on the R/V's CONRAD and ATLANTIS II) together with the multichannel seismic systems on the CONRAD and WASHINGTON have been driven by the needs of the science. Submersible science, with its recent spectacular progress, will be extendable to many more significant ocean problems when the DSRV ALVIN is provided with the global range and endurance of the R/V ATLANTIS II. The six vessels in Class A and B are unique national assets, essential to the health and vitality of U.S. oceanography. The permanent layup, without replacement, of any of these vessels would have deep and harmful effects on the U.S. national capability to conduct global research in the oceans and to carry out large scale multi-investigator research in U.S. waters or adjacent regions.

The UNOLS fleet will have eight intermediate size (Class C) vessels when the MOANA WAVE returns in 1983. These vessels have become increasingly important research platforms as U.S. oceanography has moved from a predominantly worldwide exploration mode to one of more detailed observational programs focused on specific problems. In spite of this, it is the opinion of the Advisory Council that six Class C vessels could meet the needs of the currently funded science. This conclusion is based upon information in the OSB Fleet Study Report, the NSF-ONR Task Force Report, UNOLS data on vessel utilization since 1974 and input from several operating institutions.

Of the five Class D vessels, the Advisory Council considers that a minimum of three are essential to meet currently funded science needs and that the vessels should be distributed to service the East Coast, the West Coast and Alaska.

While the Advisory Council recognizes the special ability of the two Class E ships, we believe that the best way to retain their capabilities is to place them with the Class F ships. We recommend that Class E and F ships should be removed from funding on OFS ship operating proposals and be project funded. We further recommend that the equivalent of the currently budgeted amount for these vessels (around $1.5 Million or 7% of the NSF/OFS ship operations budget of $22 Million) be set aside within OFS to fund any small vessel time requested and costed in proposals. These funds should be allocated by OFS in consultation with the science program managers who should recognize the special needs and extensive use of these vessels by biological oceanographers.

In summary, the Advisory Council recommends that the minimum UNOLS fleet consist of fifteen vessels, three Class A, three Class B, six Class C, and three Class D.

Table 2.1

THE UNOLS FLEET

	SHIP	OPERATING INSTITUTION	LOA (FT)	DISPLACMNT (TONS)	YEAR BUILT	NUMBER SCINTST	NUMBER CREW	RANGE (NM)	ENDURANC DAYS
CLASS A	Melville	Scripps	245	2075	1970	28	22	9,200	41
	Knorr	WHOI	245	1915	1969	25	24	10,000	60
	Thompson	U. Wash.	209	1401	1965	19	22	8,500	40
CLASS B	Atlantis II	WHOI	210	2300	1963	25	24	13,000	60
	Conrad	LDGO	209	1370	1962	19	20	10,000	60
	T.Washington	Scripps	209	1362	1965	23	21	8,700	29
CLASS C	Oceanus	WHOI	177	960	1975	15	12	8,000	30
	Endeavor	URI	177	972	1976	16	12	7,000	25
	Wecoma	OSU	177	1015	1975	16	13	7,500	30
	Gyre	TAMU	174	1437	1973	19	11	8,000	60
	Iselin	RSMS	170	830	1972	14	12	9,700	30
	Kana Keoki	U.Hawaii	156	1080	1967	16	15	12,500	42
	Moana Wave	U.Hawaii	174	1437	1973	13	15	8,000	45
	New Horizon	Scripps	170	598	1978	13	12	7,000	24
CLASS D	Cape Florida	RSMS	135	539	1981	12	9	7,680	21
	Cape Hatteras	Duke/UNC	135	539	1981	12	9	6,800	24
	Alpha Helix	U.Alaska	133	512	1966	15	9	7,200	30
	Velero IV	USC	110	650	1948	12	11	11,500	18
	R.Warfield	CBI	106	162	1967	10	11	1,500	30
CLASS E	Cayuse	MLML	80	173	1968	8	7	5,000	20
	E.B.Scripps	Scripps	95	234	1965	8	5	6,480	30
CLASS F	Longhorn	U.Texas	80	200	1971	10	5	2,000	18
	Blue Fin	Skidaway	72	86	1972	8	5	3,000	12
	Hoh	U. Wash.	65	81	1943	6	2	800	10
	Onar	U. Wash.	66	95	1954	6	2	750	5
	Calanus	RSMS	64	111	1971	6	2	2,500	14

CHAPTER THREE

POSSIBLE SCENARIOS FOR UNOLS FLEET COMPOSITION AND DISTRIBUTION

The Advisory Council considered two scenarios which met the "minimum" fleet composition defined in chapter two and variants of a third scenario that removed Class A ships in order to effect maximal cost savings. The first scenario may be described as "minimum disturbance", in which the maintenance of the maximum number of operating institutions was a dominant consideration. The Advisory Council is in complete agreement with the statement of the OSB Fleet Study:

> "Thus, it remains of prime importance that we continue the type of operation which does not separate the sea-going oceanographers from the responsibility for management of research vessels. This should be maintained regardless of budget levels."

The second scenario examined the concept of "minimum number of operating institutions". While this scenario would have some benefits, the Council believes that any ship distribution under such a scenario would have the effect of divorcing a significant fraction of sea-going scientists from close interaction with the operation and facilities of their vessels. Any benefits resulting from the consolidation of the fleet would be more than offset by this schism. Consequently, the second scenario in the view of a majority of the Advisory Council, is less preferable to the first.

The third scenario, with current operators, has the advantage of retaining most presently operating institutions but does so at the severe cost of further substantial damage to the national oceanographic capability. Any variant of this scenario is least preferred by the Advisory Council.

In considering the options to meet each scenario, the Council used the ship retention criteria in the manner described in chapter one. In particular, geographic criteria were uppermost in the recommendations to retain operating capabilities in Hawaii and Alaska. The national capability for work in the North Pacific and Arctic regions is enhanced by the facilities provided by the University of Hawaii and the University of Alaska and removal of either of these facilities would have a more serious effect on the National Oceanographic Program than the removal of most others.

For the facilities in the forty-eight contiguous states, the geographic considerations were considered less important and factors such as:

a) institutional impact,
b) NSF and ONR science,
c) quality of ship and ship operations,

assumed greater importance in the decisions on vessel retention.

CLASS SPECIFIC RECOMMENDATIONS

SCENARIO I

Under this scenario, the minimum fifteen vessel UNOLS Fleet is proposed as:

	SHIP	OPERATOR
Class A	Melville	Scripps Inst. of Oceanography
	Knorr	Woods Hole Oceanographic Inst.
	Thompson	University of Washington
Class B	Conrad	Lamont-Doherty Geolog. Observ.
	Washington	Scripps Inst. of Oceanography
	Atlantis II	Woods Hole Oceanographic Inst.
Class C	Endeavor	University of Rhode Island
	Oceanus	Woods Hole Oceanographic Inst.
	Wecoma	Oregon State University
	New Horizon	Scripps Inst. of Oceanography
	Iselin	University of Miami
	Moana Wave or Gyre	University of Hawaii
Class D	Cape Florida	University of S. California (California Consortium)
	Cape Hatteras	Duke-University of N. Carolina
	Alpha Helix	University of Alaska

Estimates of the full annual operating costs for this fleet are given in Table 3.2.

Class A

A minimum complement of three long range and endurance general purpose vessels are considered necessary to conduct the projected scientific operations. The only such vessels currently remaining in the UNOLS Fleet are the MELVILLE, KNORR and THOMPSON. Each should be retained and run by the current operating institution. The quality of ship operations on the THOMPSON and KNORR has been consistently good and recent operating problems of the MELVILLE have been addressed by changes in crewing policies and other adjustments. The three vessels are in fair to good condition and with proposed mid-life refits in the next few years, should be capable of extended service into the late 1990's. The chronic propulsion problems that have plagued the cycloidal vessels could possibly be removed by reengining with diesel-electric drives.

The Council urges that ONR invite WHOI or SIO to study this problem and, if feasible and warranted, present proposals for such reengining to be accomplished during the mid-life refits.

Class B

The present complement of special capability large vessels is sufficient to meet the projected scientific needs in the near future. The high resolution echosounding systems in the WASHINGTON and proposed for the CONRAD and ATLANTIS II are currently of major importance to the Geology and Geophysics community but future uses by biologists, chemists and physical oceanographers conducting detailed ocean bottom studies are likely to grow. The backlog of high quality Geology and Geophysics projects that can use these tools is sufficient to keep demand high until possible use by other disciplines increases. The multichannel seismic capabilities of the CONRAD and WASHINGTON are essential tools for modern geophysics and while it is unlikely that MCS programs will fully utilize either ship, the additional work of high resolution echosounding and other general purpose cruise legs by other disciplines should keep the ship utilization at acceptable levels. The conversion of ATLANTIS II to a tender for the DSRV ALVIN has been proposed and is strongly endorsed by the Advisory Council and the Alvin Review Committee. The increased range and endurance that would be afforded to submersible operations opens up new possibilities for important ocean science projects. Further, when not involved in submersible programs, the ATLANTIS II will have better general purposes capabilities than at present. The addition of the trainable bow thruster will improve slow speed maneuvering and the twenty-five ton lift capability will provide a unique system for the launch and recovery of heavy gear.

The Council recommends that the current operators continue to run these vessels.

Class C

The Advisory Council concurs with the assessment of the NSF-ONR Task Force that, due to the underfunding of scientific programs and the subsequent reduced need for ship time, there is an excess of vessels in this Class. With the return of the MOANA WAVE in 1983, eight ships could be operated, but we must reluctantly recommend that the discontinuation of NSF and ONR support as UNOLS vessels for two Class C ships. We recommend as soon as possible, funding for the KANA KEOKI be discontinued. With the assumption that a refitted and modified MOANA WAVE would be equivalent to the recently refurbished GYRE, we recommend that the feasibility and desirability of transferring the GYRE from Texas A&M to the University of Hawaii be explored. The decision as to whether the GYRE or a refurbished and modified MOANA WAVE should be retained will depend upon which would have the greater utility as a general purpose research vessel.

In the wake of this relocation, we recommend the formation of a southeastern ship consortium, comprised of University of Miami, Texas A&M, University of Texas, Florida State University and the University of South Florida. The consortium would operate one Class C vessel, the ISELIN, to be based in Miami, and three or more Class F ships on a cooperative basis. The relocation of or discontinuation of supply of operating funds to the GYRE should not be contingent on the successful formation of this consortium.

The Advisory Council's recommendation on Class C vessels relied upon vessel capabilities and utilization by NSF and ONR science to isolate the GYRE, MOANA WAVE or ISELIN as possible candidates for the second Class C vessel to be removed from the fleet. Secondly, geographical importance dictated the retention of a ship at Hawaii and thirdly, the institution use and recent NSF-ONR science use of the ships at Texas A&M and University of Miami.

The decision in no way reflects upon the quality of ship operations at Texas A&M which has been consistently well done. The Council earnestly hopes that the important TAMU educational activities conducted on the GYRE will be accommodated by vessels operating in a southeast consortium.

Class D

Here again, because of diminished funds for research, we must regretfully recommend the discontinuation of NSF and ONR support as UNOLS vessels for two ships together with the relocation of a third. Our assessment of projected ship utilization for the 1983-88 time frame calls for coastal vessels to be distributed with one on the east coast, one on the west coast, and one in Alaska. Considering vessel capabilities, utilization and age, we recommend the discontinuation of ONR-NSF support for the R. WARFIELD and VELERO IV. We further recommend that the CAPE FLORIDA be relocated from the University of Miami to the University of Southern California, to be operated from that base by a consortium of institutions including USC, SIO, UC Santa Barbara, Moss Landing ML and UC Santa Cruz. Class E and F vessels operated by several of these institutions could be included in the consortium.

Class E

While recognizing the special utility of the two ships in this class, the Advisory Council believes that their capabilities are best retained for NSF grantees by placing them, with Class F vessels, as a group to be project funded and thus removed from considerations of the UNOLS Fleet.

Further, we recommend that the CAYUSE be transferred from Moss Landing to the University of Washington to replace the HOH and ONAR.

Class F

In order to deal with the projected small ship needs of the 1983-88 time frame, we recommend that these vessels be funded separately from the UNOLS Fleet represented by Classes A through D.

The level of NSF/OFS funding currently supplied for these vessels should be retained to apply toward small vessel time requested and costed in proposals. We recognize that this recommendation represents no financial saving and may appear to have a disproportionately large negative impact on coastal science, particularly biology. However, we believe that this modified funding plan, coupled with other federal, state and private support for these ships will allow a viable small ship class to continue to operate. We would point out that, in addition to the seven vessels currently in the Classes E and F of the UNOLS Fleet, there are some sixty-eight other vessels of this size that are successfully operated by academic or non-profit institutions in the USA, many by UNOLS members or associate members.

While our recommendations would remove several small ships from the umbrella of regularly funded status they would also allow principal investigators who utilize vessels of this class greater latitude in selecting the ship most appropriate to their needs.

Our specific recommendations on the NSF funding of these vessels are given in chapter two.

ADVANTAGES OF SCENARIO 1

1. Provides minimum fleet with minimum disruption of existing academic institutional relationships and programs.

2. Retains existing global oceanography/multi-investigator ship capability.

3. Retains all existing major ship operating institutions except one.

4. Provides flexibility in small ship operating funds to allow wider participation of UNOLS Members/Associate Members and encourage increased state and local funding for small ships.

5. Replaces an old, but effective coastal ship (VELERO) with a new, coastal ship (CAPE FLORIDA).

DISADVANTAGES OF SCENARIO 1

1. Requires denial of support to an effective and efficient major ship operating institution (TAMU). Removes two smaller operating institutions.

2. Reduces one multi-ship operating institution to a single ship operator. (Miami)

3. Reduces UNOLS ship time availability in a region (southern East Coast) where state and local support for academic marine science is growing rapidly.

SCENARIO II

The Advisory Council examined the feasibility of consolidating fleet operations among a practical minimum of operating institutions. We agreed that four regional centers, each serving a regional consortium of institutions, and two centers for distant operations, would best meet the projected needs of the fleet and its users. Each of the regional consortia would have a principal operating center and several auxiliary ports. A tentative outline of this arrangement follows:

Consortium	Central Port	Auxiliary Ports
NECOR (WHOI,LDGO,URI)	Woods Hole	Narragansett New York
SECOR (TAMU, RSMAS, NCC, U.Tex, USF, etc.)	Miami	Galveston Beaufort St. Petersburg
SWCOR (SIO,USC, ML, UCSB, UCSC)	San Diego	Los Angeles Moss Landing
NWCOR (UW, OSU)	Seattle	Newport Eureka
Univ. of Alaska	Seward	Seattle
Univ. of Hawaii	Honolulu	San Diego

Utilizing the same fleet composition (and full fleet operating costs, Table 3.2) and classification that were developed for Scenario I, which were reviewed again for their appropriateness to this scenario, we propose a somewhat different distributional assignment of the fleet that is based upon operations from institutions who currently have capabilities for multiple ship operations:

AREA	CLASS A	CLASS B	CLASS C	CLASS D
NECOR	Knorr	Conrad Atlantis II	Oceanus Endeavor	
SECOR			Iselin	Cape Florida
SWCOR	Melville	Washington	New Horizon	Cape Hatteras
NWCOR	Thompson		Wecoma	
Alaska				Alpha Helix
Hawaii			Moana Wave	

ADVANTAGES OF SCENARIO II

1. Better coordination of ship schedules, reduced port costs, simplified proposal and review processes, and increased bulk purchase benefits.

2. This scenario would ease the effects but not facilitate any continued contraction of the fleet.

3. It would also insure the continuation of at least a minimal level of technological interaction between the ships and their users.

4. This scenario would centralize the political focus of the fleet and its users possibly allowing a more coherent and powerful voice.

5. It would open access of all members of the consortium to the greater range of equipment, instrumentation and technical support of the regional center.

DISADVANTAGES OF SCENARIO II

1. Serious decoupling of the ship users from ship operations at several levels.

2. A serious reduction of community strength that derives from the present diversity of ship operators.

3. A major reduction of autonomy for all institutions involved.

4. The probable loss to the fleet of state and local funding presently accrued by institutions which would turn over their ships to the operating centers.

5. An inconsequential financial saving would be realizable by the consolidation of vessels with fewer operations.

SCENARIO III

This plan is an exercise, however inappropriate, to remove Class A vessels from the fleet as a money saving option. Such removal could be by layup for an indefinite period or by layup of one or two Class A vessels in alternate years. Possible ship distributions under this scenario are given in Table 3.1 where scenarios III A-1 and III B-1 assume the consortium of Scenario II while III A-2 and III B-2 assume a continuance of most of the current ship operating institutions.

The relative costs for the variants of this scenario are given in Table 4.2. Each of the variants attempts to replace Class A vessel time in the minimum fleet with Class C vessel time with the assumption that some programs ideally operated on the larger ships could be accommodated on the intermediate ships. Class D vessels would reduce to three with the removal of the R.WARFIELD and the VELERO IV. However, the savings allowed by the reduction in Class A could provide for the retention of at least some of the Class D, E and F ships.

Each of these variants have reduced operating costs for the total fleet and while they have the advantage of retaining most current operators, it is the opinion of the Advisory Council that the further removal of large general purpose ship time would have a very serious detrimental impact on the national capability for global ocean research and for multipurpose cruise operations.

Table 3.1

SCENARIO III
(four combinations)

III A-1 Consortium Center	A	B	C	D	III A-2 Present Operator
Alaska Hawaii			Moana Wave	Alpha Helix	U.A. U.H.
NWCOR	Thompson		Wecoma		U.W. OSU
SWCOR	[Melville*]	Washington	Gyre New Horizon		USC SIO
SECOR			Iselin	Cape Florida Cape Hatteras	U.M. UNC
NECOR	[Knorr*]	Conrad A-II	Endeavor Oceanus		LDGO URI WHOI
	2 1/2	3	7	3	

III B-1					III B-2
Alaska Hawaii			Moana Wave	Alpha Helix	U.A. U.H.
NWCOR	[Thompson*]		Wecoma		U.Wash. OSU
SWCOR	[Melville*]	Washington	Kana Keoki New Horizon		USC SIO
SECOR			Iselin Gyre	Cape Florida Cape Hatteras	U.M. UNC TAMU
NECOR	[Knorr*]	Conrad A-II	Endeavor Oceanus		LDGO URI WHOI
	2	3	8	3	

*alternate year lay up

Table 3.2

FLEET OPERATING COSTS FOR FULL OPERATING YEARS
(Based on 1982 cost estimates in NSF-ONR Task Force document.)

	SCENARIO			
	I	II	III A-1,2	III B-1,2
Melville	3.0	3.0	1.8*	1.8*
Knorr	3.0	3.0	3.0	3.0
Thompson	2.2	2.2	2.2	1.3*
Atlantis II	3.0	3.0	3.0	3.0
Conrad	2.2	2.2	2.2	2.2
Washington	2.5	2.5	2.5	2.5
Endeavor	1.6	1.6	1.6	1.6
Oceanus	1.6	1.6	1.6	1.6
Wecoma	1.6	1.6	1.6	1.6
Moana Wave	1.6	1.6	1.6	1.6
Iselin	1.6	1.6	1.6	1.6
New Horizon	1.6	1.6	1.6	1.6
Cape Florida	1.2	1.2	1.2	1.2
Cape Hatteras	.8	.8	.8	.8
Alpha Helix	1.4	1.4	1.4	1.4
Gyre	---	---	1.6	1.6
Kana Keoki	---	---	---	1.1
Total	28.9	28.9	29.3+	29.5+
			27.5#	27.7#
				26.4**

* Assumes alternate year operation with 20% layup costs for one year added to full costs for second year averaged over two years.

\+ Total costs for alternate year operations of MELVILLE/KNORR in III A-1&2 and MELVILLE/KNORR and THOMPSON in III B-1&2.

\# Total costs with removal of MELVILLE/KNORR.

** Total costs with removal of MELVILLE/KNORR and THOMPSON.

CHAPTER FOUR

FLEET MANAGEMENT

The NSF-ONR charge to the Advisory Council included a request for specific recommendations on management of the UNOLS Fleet in the 1983-88 time frame.

Recommendations

In response to this charge, the Council recommends:

1. Establish a mimimum UNOLS Fleet of fifteen vessels in the Classes A-D defined in chapter two and operated as outlined under Scenario I, chapter three. Operate all other vessels on a project funded basis with requests specifically costed in proposals.

2. Establish a National Expeditionary Planning Committee (NEPC) with responsibilities for long lead time planning for the use of Class A and B vessels.

3. Continue UNOLS East-West regional scheduling process including scheduling information supplied from the National Expeditionary Planning Committee.

4. Encourage the use of the least expensive scientifically appropriate ship by requiring that funds for needed ship time be explicitly stated in NSF proposals on revised 831 forms.

Discussion

The minimum fleet and the mechanism for funding small ships has been discussed in chapter two.

The Class A (KNORR, MELVILLE and THOMPSON) and the Class B (ATLANTIS II/ALVIN, CONRAD and WASHINGTON) vessels represent unique national assets, essential to the health and vitality of U.S. oceanography. These vessels are the core of our nation's expeditionary and global capability for the support of the ocean sciences. As science funding continues to be scarce, variations in the year-to-year demand for these vessels may occur in the future but, in the opinion of the Advisory Council, the permanent removal of any of these ships would have serious detrimental effects on ocean science.

The efficient use, with community wide access of a minimum large vessel facility under conditions of scarce funding and variable year-to-year demands can be ensured only by long range planning. Accordingly, the Advisory Council recommends that the current UNOLS scheduling procedures be modified to include a National Expeditionary Planning Committee.

The responsibilities of this committee shall include:

1. The committee shall have long range planning responsibility for Class A and B vessels, together with ALVIN. The committee shall coordinate and integrate the unique capabilities of these vessels on a nation-wide basis.

2. The committee, starting three years ahead of the operating year, based on letters of intent, shall develop suggested general operating regions and expedition plans. The committee shall circulate to the entire ocean science community the proposed regions of operation.

3. Starting two years before the operating year, the committee shall solicit proposals to be simultaneously submitted to funding agencies.

4. The committee, together with agency representatives, shall consider these proposals and present information and recommendations to the UNOLS E/W Fleet scheduling committees approximately one year before the operating year.

It would be the intent of the NEPC, together with agency representatives, to have schedules for the Class A and B vessels reasonably well established, with at least 70-80% of the funding committed (subject to Congressional appropriation of funds) one year prior to the operating year. The Alvin Review Committee would continue to review submersible use and input their recommendations to the NEPC.

The committee should consist of:

a) A chairman, selected from the community at large for his scientific expertise and knowledge of ship operations, appointed by the Advisory Council.

b) A representative of each of the four institutions, operating a Class A or B vessel, who is knowledgeable about both scientific research and ship operations. The WHOI representative normally shall be the Institutional ex-officio representative to the Alvin Review Committee who shall represent his broad institutional interest and the specific needs of the Alvin program.

c) Two members appointed from the Advisory Council.

d) The UNOLS Executive Secretary (ex-officio).

The term of the chairman shall be three years and renewable . The terms of the Advisory Council members shall be two years and renewable. The terms of the institution representatives shall be determined by the institutions.

The intent of these recommendations is to provide the maximum flexibility and efficiency in the total ship operations. Under-utilization of the fleet by the year-to-year variations in science demands may require ship layups in the future as it has occasionally in the past. Future vessel layups from the minimum fleet should be undertaken with the clear understanding that the vessel will be returned to the fleet and should be planned so that the maximum possible savings will occur. The layup of a large vessel for a whole operating year saves approximately 80% of the operating costs as opposed to very much smaller savings associated with short term layups of several vessels. Such layups should be scheduled to include or be contiguous with routine maintenance periods. The savings from reductions in large (or intermediate) vessel operations could be applied to substantially upgrading one or more ships and to small vessel operations provided the operating decisions are made early enough.

It is proposed that the NEPC scheduling and funding information for the Class A and B vessels, together with information on the possible accommodation of some programs in Class C vessels, enter the regular UNOLS East-West scheduling process. The funding of the Class C and D vessels in addition to Class A and B should be 80% firm by the Spring UNOLS scheduling meeting.

We cannot emphasize too strongly that efficiency in the use of Federal funds for ship operations requires that funding commitments be made sufficiently early so that cost effective layups can be planned in ways that minimize the impact on science.

Earlier planning of major expeditions has the advantage of placing the scheduling of U.S. vessels in a time frame consistent with that of other nations e.g. United Kingdom, France and West Germany. As a consequence, temporary exchanges of ship facilities and joint scheduling of some projects could be much more easily accomplished.

The Alvin Review Committee should continue to perform the function of detailed considerations of submersible science proposals and coordinate the proposed scheduling of the ATLANTIS II/ALVIN with the NEPC.

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

June 14, 1982

Dear Colleague:

At a meeting on May 23, the UNOLS Advisory Council, in response to a specific charge from the National Science Foundation, Ocean Sciences Division and from the Office of Naval Research, passed, by unanimous vote, the following resolution:

> "That the UNOLS Advisory Council accept a specific charge from the National Science Foundation, Ocean Sciences Division, and the Office of Naval Research that the Advisory Council develop specific recommendations on a ship-by-ship basis for the composition, distribution and management of the UNOLS fleet in the 1983-1988 time frame. These recommendations to be based on assessment of existing data, studies and projections for the UNOLS fleet and projections for its future funding. A report will be drafted by September 1, 1982, distributed to the UNOLS membership for comment and the report and membership comments will be delivered to NSF and ONR by October 1, 1982."

The vessels to be considered in developing the recommendations are those used in the recent NSF projection and generally referred as the:

NSF-Supported Academic Fleet

Class	Vessel	Length (ft)	Displacement Tonnage	# Science Berths	Range (nm)	1982 Operating Cost(K$)
1	Melville	245	2075	30	9000	3000
1	Knorr	245	1915	25	10000	3000
1	Atlantis II	210	2300	25	13500	3000
2	Washington	209	1362	19-22	9000	2500
2	Thompson	209	1401	19	8000	2200
2	Conrad	208	1370	18	9000	2200
3	Endeavor	177	972	16	7000	1600
3	Wecoma	177	1015	16	7500	1600
3	Oceanus	177	960	12	7000	1604
3	Gyre	174	1437	18	11000	1600
3	Iselin	170	830	13	12000	1600
3	New Horizon	170	598	13	6000	1600
3	Kana Keoki	156	1080	16	10000	1100
3	(Moana Wave - reported to be returned to fleet in mid 1983.)					

NSF-Supported Academic Fleet (cont)

Class	Vessel	Length (ft)	Displacement Tonnage	# Science Berths	Range (nm)	1982 Operating Cost(K$)
4	Alpha Helix	133	512	12	6500	1400
4	Cape Florida	135	539	12	5600	1200
4	Cape Hatteras	135	539	12	7700	800
4	Velero IV	110	650	12	11500	700
4	R.Warfield	106	162	10	1000	700
5	E.B.Scripps	95	234	8	5200	700
5	Cayuse	80	173	8	4500	600
5	Longhorn	80	200	10	2000	350
5	Blue Fin	72	86	8-10	2600	150
5	Hoh	65	81	6	600	150
5	Onar	66	95	6	1000	150
5	Calanus	63	111	6	2500	300

The availability and utilization of other vessels such as the Cape Henlopen, Fred Moore and Laurentian will also be considered.

An NSF internal task force, assisted by ONR and other agency representatives has assessed the Projected Use-Days for the above fleet based upon their understanding of the at-sea science likely to be funded by the limited amount of science funds available. These projections were distributed to UNOLS members earlier in a draft manuscript entitled "Projected Ship Needs for Ocean Science Research, 1983-1988". The essential conclusions are re-stated in the following table:

COMPARISON OF AVAILABLE AND PROJECTED USE-DAYS FOR CY 1983

Class	Average Use Days Per Year	# Ships	Available Use Days	Projected Use Days	Transit Time Factor	Adjusted Projected Use Days	Excess Projected Use Days
1	260	3	780	530	10%	583	197
2	260	3	780	868	10%	955	-175
3	240	7	1680	1430	5%	1502	178
4	220	5	1100	417	0%	417	683
5	200	7	1400	868	0%	868	532
		25	5740	4113		4325	1415

These projections were delivered by the NSF OSD accompanied by several notes:

(1) Class 1 useage in 1983 may represent an anomaly as suggested by projected increases in 1984 and beyond for physical, chemical and polar oceanographic work.

(2) Conversion of a class 1 ship into an Alvin tender is being discussed and would significantly effect the availability of ship time in this class.

(3) Additional ship time needs projected for class 2 ships may be accommodated by use of class 1 and class 3 ships plus some queuing.

(4) Underestimates of projected use-days for class 4 and class 5 ships are likely for several reasons including:

a. Lack of experience with new coastal ships.

b. Difficulties in projecting the numerous short duration cruises for which these ships are frequently used.

c. Greater proportion of use by sponsors other than NSF and ONR for class 5 ships.

d. Use by other sponsors frequently develops after NSF and ONR needs have been projected and scheduled.

Despite these uncertainties it is clear that a major excess of available ship time over the projected funded science needs is present in 1983. At this time significant increases in either science or ship funds for years beyond 1983 cannot be anticipated. The provision of funds for temporary lay-ups can reduce some of this excess and preserve a capability for the future but there is clearly a point where this becomes a very inefficient use of federal funds that otherwise may be available for science and new facilities.

In order to develop its recommendations the Advisory Council has adopted the following process and schedule:

1) Notification of process to the community by UNOLS Chairman with solicitation of information.

2) Obtain input material (see later list) and distribute to the Advisory Council members for study.

3) Advisory Council Workshop I. July 8-9, Boulder, Colo.

a. Assess the input material including science, ship and funding projections to establish AC concurrence, or non-concurrence with NSF task force projections on excess vessel time. Establish boundary condition of minimum fleet to meet projected funded science needs.

b. Develop criteria for ship retention using criteria suggested by NSF Task Force, Ocean Sciences Board Fleet Study, 1982 together with input from the community.

c. Develop scenarios that meet the boundary conditions identified in a. above.

d. Critique each scenario, pointing particularly to the effects on both oceanographic science and institutions.

4) Distribute preliminary document to UNOLS members and associate members and seek member response to the scenarios and critiques developed in 3 c. and 3 d. above.

5) Advisory Council Workshop II. August 19-20, Boulder, Colo.

a. Assess responses to preliminary document.

b. Select one scenario, or a very limited set if some are equivalent, that, in the opinion of the Advisory Council preserves the maximum capability for ocean science in the near future.

c. Write final report and distribute it to members so that they may comment to NSF, ONR as they desire.

6) On or before October 1, 1982 distribute final report to UNOLS members and associate members and to NSF and ONR.

The final report may include recommendations that infer temporary lay-ups, decommissions and vessel re-allocations together with suggestions for re-distribution of funding presently apportioned to ship operations, ship construction and maintenance, equipment and instrumentation and science. In addition, the recommendations may include suggestions for the formation of one or more new consortia of operating institutions and possible changes in the current ship scheduling and operating procedures particularly to accommodate future extended cruises to remote locations which will be more difficult to mount with decreased vessel time. All member and associate member institutions, but particularly those that may be directly affected by the implementation of any of the recommendations, will be given the fullest of opportunities for comment and criticism. The Advisory Council recognizes that it does not possess the authority to stipulate ship decommissions, lay-ups or transfers. It is, however, by terms of the UNOLS Charter, charged "to evaluate the need for replacement and additional facilities and assess whether some facilities are outmoded or in excess of current needs."

Accordingly, where and if necessary, the recommendations of the Advisory Council will be:

1) To deny, for the forseeable future, Federal operating funds for some vessels.

2) To supply lay-up funding for some vessels that are particularly important national resources but, because of the immediate state of ocean sciences, may be only temporarily in excess of needs.

3) Where vessel re-allocation appears prudent and the vessel is owned by a federal agency, to urge that agency to effect the transfer.

The following material will be used during the Advisory Council deliberations:

1) Information solicited from all UNOLS member and associate member institutions. (see later)

2) Material supplied by the Federal agencies on ship and science funding projections.

3) The UNOLS Advisory Council Report, July 1978, "On the Orderly Replacement of the Academic Fleet" as updated to the existing 1982 fleet.

4) The Ocean Sciences Board fleet study, May 1982, "Academic Research Vessels, 1985-1990".

5) The UNOLS Submersible Science Study, May 1982.

6) The NSF Division of Ocean Sciences documents " Projected Ship Needs for Ocean Science Research, 1983-1988" and " Criteria for Assessing Ship Retention Value" together with the data upon which these documents were based.

7) A UNOLS Advisory Council position paper "An Outline of Issues for Ship Management", May 1982.

8) The most recent ship condition reports for all Federally funded UNOLS vessels.

9) UNOLS ship utilization data 1973-1982 and Advisory Council ship assessment forms, 1981-82.

10) Any other reports and data germane to 1983-1988 fleet recommendations.

At this time I specifically solicit information and comment from member institutions and individuals in the community. Communications should be addressed either to me or to:

Capt. William. Barbee, Executive Secretary
UNOLS Office, WB-15, School of Oceanography
University of Washington
Seattle, Washington 98195

From all institutions and individuals :

1) Comment on the above Advisory Council process, including any additional steps or materials that may be deemed necessary or desirable.

2) Comment on the NSF Task Force documents - "Projected Ship Needs for Ocean Science Research, 1983-1988" and "Criteria for Assessing Ship Retention Value".

3) Comment on the Ocean Sciences Board fleet study, 1982, "Academic Research Vessels, 1985-1990" recommendations.

4) Any other relevent information or comment.

From ship operating institutions:

1) Information on Port facilities and their value to the local, regional or national aspects of marine science.

2) An assessment of the value of your vessel to you and to the regional and national community of ocean scientists.

3) Recent comprehensive ship condition reports.

4) Information on current or planned capabilities that might provide special purpose or unique facilities for ocean science.

5) A projection of the ship requirements of your institution through 1986, including both Federally and non-Federally funded operations.

6) Any other relevent information or comment.

This information should be delivered to me or to Captain Barbee before the July 8 Advisory Council Workshop.

Please be aware that this upcoming exercise is likely to have a profound effect on ocean sciences, individual institutions and on the national academic fleet facilities. Your considered input is urgently requested and needed. The status of the current academic fleet with the clear need for replacements in the 1990's is extremely difficult to approach unless we face now the realities of excess ship availability and the limitations on the funding of ocean science in the next few years.

Sincerely,

Derek W. Spencer
Chairman, UNOLS

DWS/ban
enclosures

Criteria for Assessing Ship Retention Value

Recent and projected use of the academic fleet provides a general picture of the scientific needs for shiptime in the various size classes. These needs are substantially limited by available research funding and are exceeded by available shiptime in several of the size classes. And, it appears that this situation will continue for the next several years at least. Under these circumstances and in order to get the most out of limited resources, we believe it desirable to diminish the size of the fleet and concentrate our resources on a smaller number of ships. Clearly such action will impact the field of ocean science. It must therefore be done cautiously, objectively, and with the view of minimizing the difficulties and maximizing the benefits. It must also begin immediately in order to deal effectively with the short-term problems we face in FY 1983 and it should lead to a continuing, long-term evaluation of the composition and usefulness of the academic fleet ships.

As a guide for making these short- and long-term assessments of the academic fleet, we have developed a set of six criteria. These criteria when applied to individual ships will provide a measure of the scientific value and operational effectiveness of that ship relative to other ships in her class size. The criteria are weighted differently, are non-overlapping to the extent possible, and allow for gradations among the ships in a given class. The criteria weighting will change from class to class.

The criteria are listed in Table 1 and the numbers below correspond to that table. The six criteria fall into three categories. The first category relates to the ship itself, and includes an assessment of i) the scientific capability of the ship, and vi) the present material condition of the ship. The second category involves the operation and use of the ship; this includes an assessment of v) the quality of recent operation and ii) the value to the Foundation and ONR of her recent scientific use. The final category attempts to assess the importance of a ship on iv) a regional and national basis and iii) an institutional basis.

These criteria and some general assessments of their weighting are discussed in more detail below.

(i) Scientific Capability

The following factors, and their rational warrant consideration in assessing the ability of a ship in a given class to carry out scientific programs.

a) The size, arrangement, and equipment available in the wet and

dry laboratories. The quality and extent of work that can be carried out on board a ship is also dependent upon configuration and space available in her laboratories including portable vans. Is an uncontaminated sea water supply available in quantity? Is there plentiful regulated and protected electrical power? Is there space available for scientific freezes? Is the ship laid out so that a variety of sampling procedures can be used: hydrocasts, rosette samplers, large volume sampling, etc? Is there sufficient laboratory space to permit scientific manipulations unhindered by traffic?

b) The number of scientists that can be carried, the quality of their accomodations, including messing arrangements. Because of the complexity of the marine environment, it is often necessary to have a number of specialists aboard and for them to be able to work around the clock and at all times of the day; observations in remote locations are also necessary, and this, and other considerations, may require extended cruises; hence, it is important that a reasonably sized scientific party be carried, and for their morale and the quality of their scientific work to remain high, it is necessary that they be accomodated with reasonable comfort on board the ship.

c) The amount of deck and hold space suitable for storage, the amount of deck space assessable by winch or crane and suitable for use with over-the-side operations. Multi-legged expeditions often require that specialized equipment be stored, especially when different disciplines are using the ship, and in carrying out over-the-side operations, it is important that space be available on the deck to lay out equipment, and if necessary, to pick up and move around heavy items of hardware.

d) The manuverability of the ship, her sea keeping ability, and her comfort in a sea way. These are important consideration in carrying out scientific operations, especially in moderate and rough weather (when it is also important to make in situ observations); the ride of the ship often affects the scientists' ability to do precise laboratory work; manuverability is important in keeping wire angles at acceptable levels, in picking up floating equipment, and in setting moored arrays.

e) Configured for important scientific instrumentation and experiments. In this category we include additional and specialized observational capability such as sea beam, ice-strengthened hull, acoustic doppler profilers, cold rooms, lack of C14 contamination, acoustic quietness, and multi-channel seismic capability.

f) The ability of the ship to handle equipment, e.g. her outfit and placement of winches, capstans, A-frames, booms, and cranes. Most experimental work depends on handling equipment over the side such as nets, corers, CTD and Rosette samplers, sediment traps, underwater electronic equipment, buoys and current meter moorings, etc.

g) The speed of the ship. This is an important factor in minimizing the time between stations, the time to an operating area, and determines the "synopticity" of a survey.

h) The endurance of the ship. This determines the number of days a ship can operate at sea and the total distance that she can travel; it is an important scientific consideration when observations must be made in remote locations or for an extended period of time, and also when an extended cruise track is necessary such as the Scorpio sections across the South Pacific.

i) Multipurpose capability. In general, it is important that a ship be able to handle a wide range of projects, not only to insure that the demands of a multi-disciplinary cruise be meant, but also so that when a ship is operating in a given region, she can be assigned a variety of tasks.

In general we feel that scientific capability is the single most important criterion in assessing the value of a ship. This is based primarily on the fact that many of the factors included with in this criterion, such as speed and endurance and seakeeping, are difficult or costly to change.

(ii) Value to NSF/ONR of Recent Scientific Use

This criterion is meant to assess the extent to which the ship has proven in recent years to be an important and widely used platform by NSF and ONR sponsored researchers. These projects comprise the bulk of academic basic research, and, as with basic research itself, continuity of effort is important for effective ship operations. Elements of this criteria are:

a) actual use by NSF/ONR projects;

b) actual use by OCE projects.

This criterion merits a moderately heavy weight as a good measure of satisfactory operation, utility, availability and demand.

(iii) Institutional Importance

The existence of an institutional ship is often an important factor in recruiting faculty and developing research and educational programs. In applying this criterion, the following elements warrant consideration:

a) the scientific capability and potential of an institution;

b) the institutional (vs. outside) use of the vessel;

c) the impact on the institution if the vessel were lost; and

d) available or negotiable alternatives to meeting the institutional needs for shiptime.

The weighting of this criteria is most difficult to assign. In some instances it could be the overriding consideration at least in the short-term. Over time, as shared use and regional or joint scheduling increase, it may become less important.

(iv) Regional and National Importance

Because of a specific scientific capability, or because they are the only vessel which operates regularily in a region, some ships may have an importance than transcends their institutional affiliation. To aid in this assessment, the following elements should be considered:

a) the availability of suitable alternate ship(s) in the region;

b) the extent to which the scheduling procedure for the ship is regionalized;

c) the quality of the regional scientific programs using the ship;

d) the fullness of the ships schedule in supporting regional needs; and

e) the importance or uniqueness of the geographic area.

We believe this criterion warrants moderate weight, but its importance is somewhat lessened by the mobility and range of ships.

(v) Quality of Recent Operation

This criterion is meant to assess the quality of the operation of the ship by her crew and institution. Elements to be considered include:

a) the capability of the captain and crew to perform their duties and includes navigation, piloting, seamanship, vessel manuvering, operation of her engines, propulsion, generators, pumps, and other engine room and deck machinery;

b) the cooperation of the crew with the embarked scientific party;

c) the institutional support and management of the ship operation;

d) the total days the ship is operated at sea; and

e) the daily operating costs and cost effectiveness.

This is a more important criterion than is probably generally recognized and warrants a moderate weight. Many scientists would willingly sacrifice some ship capability in order to work with a professional, helpful crew. Overall fleet efficiency will be improved if, compared to other ship's in her class, a vessel is able to get more work done per day at sea or spend an additional month or month and a half at sea per year. However, to some extent, these factors can be managed and tend to change over time. Reassignment of a ship to an institution with a better marine operations department is also a method to resolve problems in this category.

(vi) Present Material Condition

This criterion is meant to assess the state of maintenance and the condition of a ship. Elements warranting consideration include the condition and general maintenance of the:

a) hull,

b) engines and propulsion system,

c) winches and deck machinery, and

d) interior spaces including habitability.

Also included are the ship's:

a) estimated remaining life, and

b) her required upgrading and refit costs.

In managing a stable fleet which met all scientific needs, this criterion would provide an important guide for planning vessel replacement and maintenance. In assessing retention value of ships in a given class size of the fleet, it warrants sufficient weight so that all else being equal, it would clearly discriminate between two individual ships, one in good condition and one in poor condition.

TABLE 1

Criteria For Assessing Ship Retention Value

I. Scientific Capability

- Factors to be considered include:

  * Laboratory Availability/Capability
  * Size of Scientific Party
  * Usable Deck Space and Hold Space
  * Maneuverability/Seakeeping/Riding
  * Configured for Specialized Instrumentation/Experiments
  * Equipment Handling
  * Speed
  * Endurance
  * Multipurpose Scientific Capability

II. Assessment of Value to NSF & ONR of Ship's Recent Scientific Use

- Factors to be considered include:

  * Actual Use by NSF & ONR Grantees
  * Actual Use by OCE Grantees

III. Institutional Importance of Ship

- Factors to be considered include:

  * Scientific Capability/Potential of Institution
  * Institutional (vs. Outside) Use of Vessel
  * Impact on Institution if Ship Lost

IV. Regional/National Importance of Ship

- Factors to be considered include:

  * Availability of Alternate Ship(s)
  * Quality of Regional Science Program Using Ship
  * Openness of Scheduling Procedure for Ship
  * Ship Supports Research in Unique/Important Geographic Areas
  * Fullness of Recent Schedules

V. Assessment of Quality of Recent Operation

- Factors to be considered include:

  * Capability and Cooperation of Captain and Crew
  * Operation of Ship's Equipment (winches, wire, etc.)
  * Operation of Ship (Engines, Propulsion, etc.)
  * Institutional Management of Ship Operation
  * Tightness/Efficiency of Scheduling
  * Operation Costs

VI. Present Material Condition

- Factors to be considered include:

  * Estimated Life
  * Required Upgrading/Refit Costs
  * Engines/Propulsion
  * Hull
  * Winches/Equipment Handling
  * Habitability
  * General Maintenance

APPENDIX III

RESPONSES TO SECOND DRAFT ADVISORY COUNCIL
REPORT ON COMPOSITION, DISTRIBUTION AND MANAGEMENT
OF THE ACADEMIC FLEET

1. Advisory Council Chairman's letter, August 27, 1982 distributing draft and soliciting responses
2. UNOLS Chairman's letter, October 1, 1982 soliciting responses to draft report
3. George G. Shor, Scripps, letter to Advisory Council September 20, 1982
4. Charles E. Herdendorf, Ohio State University letter to Advisory Council September 16, 1982
5. George G. Shor, Scripps letter to Advisory Council September 27, 1982. (with attachments)
6. T.K. Treadwell, TAMU letter to Advisory Council September 23, 1982.
7. P.A. Meyers, University of Michigan letter to Advisory Council September 30, 1982
8. Fred N. Spiess letter to Advisory Council, October 1, 1982
9. Robert A. Knox letter to Advisory Council, October 1, 1982
10. Ken C. Macdonald letter to Advisory Council, October 5, 1982
11. H. Craig letter to Advisory Council, October 4, 1982
12. Charles C. Erikson letter to Advisory Council, October 6, 1982
13. Robert E. Wall letter to Advisory Council, October 5, 1982
14. David W. Menzel, Skidaway letter to Advisory Council, October 8, 1982
15. Harris B. Stewart, Old Dominion University letter to Advisory Council, October 6, 1982
16. George H. Keller, Oregon State University letter to Advisory Council, October 7, 1982
17. Charles E. Helsley, University of Hawaii, letter to Advisory Council, October 8, 1982 (with attachments)
18. E. Eugene Allmendinger, University of New Hampshire, letter to Advisory Council, October 8, 1982 (with attachments)
19. J. Robert Moore, University of Texas letter to Advisory Council, October 15, 1982
20. Leroy M. Dorman letter to Advisory Council, October 13, 1982
21. Thomas H. Jordan letter to Advisory Council, October 13, 1982
22. Russ E. Davis letter to Advisory Council, October 12, 1982
23. John A. Orcutt letter to Advisory Council, October 13, 1982

24. George G. Shor, Scripps letter to UNOLS Chairman, October 11, 1982
25. Alan Berman, University of Miami letter to Advisory Council, October 11, 1982 (with attachments)
26. Lawrence Lawver letter to Advisory Council, October 12, 1982
27. W.S. Gaither, University of Delaware letter to Advisory Council, October 12, 1982 (with attachments)
28. John G. Sclater letter to Ronald R. LaCount (NSF), October 8, 1982

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

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SANTA BARBARA • SANTA CRUZ

MARINE SCIENCE INSTITUTE

SANTA BARBARA, CALIFORNIA 93106

August 27, 1982

TO: UNOLS Members and Associate Members

Dear Colleague:

The enclosed document is the draft final report of the Advisory Council's response to the request by NSF and ONR that we make recommendations on the composition, distribution, and management of the academic fleet for 1983-88. Our recommendations have changed somewhat from those presented in the preliminary report we distributed after our July workshop. In large part these changes are due to the feedback we received from the community prior to our August workshop. We are grateful for your responses and we again encourage you to carefully consider the present version and provide us with your criticisms, comments and alternative suggestions.

Written responses should be directed to the Executive Secretary:

Captain William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

The final report will be submitted to NSF and ONR by October 1, 1982. We will have the opportunity to openly discuss the report and its recommendations, with participation by NSF and ONR representatives, at the UNOLS semi-annual meeting in Washington, D.C. on October 15, 1982.

Our final recommendations are likely to have a significant influence on decisions by NSF and ONR relative to the academic fleet and to oceanographic research in the future.

Thank you for your assistance in this effort.

Sincerely,

Bruce H. Robison
Chairman, UNOLS Advisory Council

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

October 1, 1982

Dear Colleague:

You have now received the second draft copy of the Advisory Council's report concerning recommendations on the composition, distribution and management of the academic fleet for 1983-88.

By this letter I invite your written comments on the recommendations in this report. I will be pleased if these comments address both the recommendations on the fleet composition and distribution and the scheduling and management issues.

Your comments will be transmitted to the Agencies together with the final report.

Please send your comments to:

Captain William D. Barbee
UNOLS Executive Secretary
UNOLS Office WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Yours sincerely,

Derek W. Spencer
Chairman

DWS/ban

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SCRIPPS INSTITUTION OF OCEANOGRAPHY

LA JOLLA, CALIFORNIA 92093
Cable Address: SIOCEAN, La Jolla, CA
TWX: 910-337-1271
Telemail: Scripps.Inst

20 September 1982

TO: UNOLS Advisory Council

Joe Curray has informed me that your latest draft report reverses the original recommendation, and now recommends the "retirement or layup of R/V Melville" on the grounds of lack of demand and poor maintenance.

I cite your earlier report which said that "the permanent retirement without replacement of any of these (class A and B) vessels will have deep and harmful effects on the national capability to conduct global research in the oceans..." This is just as true now as it was in July.

Perhaps you chose not to believe me when I said that we have a very heavy schedule of requests for Melville for 1983, more than the ship can handle, and almost a full year of tentative or firm requests for 1984. Obviously you also do not believe me, or the American Bureau of Shipping, or USCG, when they say that Melville is now in excellent condition. I will gladly accept any sort of inspection by knowledgeable people as to whether Melville is now in as good material condition as any other UNOLS vessel, and probably in better shape than most.

I suggest that you ask those Chief Scientists who were hurt by Melville's breakdowns of last year whether they agree with your recommendation or not; these were Ken Smith, Ray Weiss, Harmon Craig, and Peter Lonsdale. You might also ask those who have put in a strong pitch for time on the Melville in 1983 and 1984, including some of the above plus Ken Macdonald, Osmund Holm-Hansen, Bob Fisher, Fred Spiess, Arnold Gordon, and others, whether their type of oceanography would be served by retirement of Melville and shifting their programs to Gyre or Iselin.

I, and others, believe that your recommendation will indeed do irreparable harm to U.S. oceanography, no matter how much you add qualifying words. If the aim was a political one: to recommend the most shocking possible action, in the hope that it would generate additional funds, I fear it will backfire. Such actions usually do. Please ask the users before you do this.

Sincerely yours,

George G. Shor, Jr.
Associate Director

GGS/dwp
cc: Bill Barbee ✓
All mentioned.

The Ohio State University

Center for Lake Erie Area Research
Franz Theodore Stone Laboratory
Ohio Sea Grant Program

College of Biological Sciences
484 West 12th Avenue
Columbus, Ohio 43210

Phone 614 422-8949

16 September 1982

Captain William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, Washington 98915

Dear Capt. Barbee:

The purpose of this letter is to support the position of Drs. Ragotskie and Beeton on UNOLS participation in the sponsorship of research vessels in the Great Lakes. I don't need to point out the national and international importance of these immense bodies of fresh water and the adverse impacts to the academic fleet here from drastic cuts in federal funds.

The Ohio State University has operated research vessels on Lake Erie for nearly 90 years and conducted lake-wide cruises since 1928. Recently, we operated one class E vessel, the R/V Hydra and two class F vessels, the Biolab and Gibraltar. For your reference, I am enclosing a set of description sheets and diagrams for the Hydra.

Vessels of these classes are extremely important to the overall research needs and goals for the Great Lakes. They have also proven themselves to be the most cost effective and time efficient method of data collection in our region. Therefore, I urge you to act favorably on our request to support vessels in Classes E and F.

Sincerely,

Charles E. Herdendorf

Charles E. Herdendorf
Director

CEH/amw

cc: A. M. Beeton
R. A. Ragotzkie

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September 27, 1982

Mr. William Barbee
UNOLS Office WB-15
University of Washington
Seattle, WA 98195

Dear Bill:

I have taken the liberty of giving copies of the UNOLS Advisory Council draft report to a number of past and prospective users of Melville, with marginal notations, so that they can write to you and the Council directly.

Among the rather important errors that I have found in the report are various statements about Melville; I have noted these in copies to the reviewers, but shall repeat them here. In several cases, these are half-truths or untruths that I have commented on earlier; there seems to be a continuing source of "disinformation" about Melville somewhere.

Page 20, item 3a, is enclosed, marked up. I elaborate.

We try to schedule on Melville programs that need the special capabilities of that ship. Programs that could use a smaller ship are not scheduled on Melville unless they are needed to link up to distant operations and avoid transit runs. The type of programs requiring this ship are:

(1) Ones with a very large scientific party. It has berths for 29, legal capacity 39, and has carried as many as 35 (the largest in the UNOLS fleet).

(2) Geochemical programs sampling for low levels of natural radioisotopes. Melville has been kept clean, and we continue to make strong efforts to keep it so, unlike most other ship operators.

(3) Programs handling especially large or bulky equipment. Melville has more deck space and carrying capacity than any other UNOLS ship except Knorr. Its A-frame is now being modified to allow it to lift up to 10 tons (move it, not just static load) to improve this capability even more.

(4) Programs requiring work in continuing rough weather; Melville, Knorr, and Atlantis II are the only UNOLS ships capable of continuing at-sea operations in the Antarctic, safely.

Unfortunately, the types of programs that meet these requirements are usually high-cost programs for the scientific side. Since the end of IDOE, such programs have usually been "cliff-hangers" at NSF, with delayed decisions on funding, and not too high a batting average. It is therefore not uncommon to have major chunks of the schedule drop out during review; such happened to us this year, for instance, with postponement of 120 days requested for Transient Tracers for 82/83, turndown of a month for Miller's Project SUPER, a 2-year postponement of a large project for NOSC (they lost their equipment at sea from a Navy ship), etc. I am sure that operators of the smaller ships have similar scheduling problems--but the odds are longer and the chunks of time are bigger for Melville, Knorr, and A-2 (unless we play it safe, and schedule smaller-scale lower-cost programs that could as well use a class C ship). Therefore: "difficulty in Scheduling" may be literally true--but not because of low demand; rather it is because of the wild fluctuations in the schedule from week to week.

A case very much in point:

May 1, 1982, Melville's 1983 schedule was 297 days, no transit time, no DPP, then one program dropped out. May 12, 1982, schedule sent to UNOLS Scheduling meeting was 263 days. OK? May 23, 1982, at the scheduling meeting, we learned that Project SUPER had been declined, removing time from Melville, Thompson, and Wecoma.

We also learned that Peter Niiler had "double-booked," making firm commitments for use of both Melville and Thompson. If he felt he could use Thompson, he shouldn't use Melville. This reduced Melville schedule to 198 days. THAT IS THE NUMBER USED FOR THE COMMENT IN 3a)1) about the "full schedule in 1983 results from 90 days Polar Programs time added after completion of the UNOLS scheduling cycle." THE UNOLS SCHEDULING CYCLE IS NOT YET COMPLETED, FOR ANY SHIP.

Sept. 27, 1982. Since that time, potential users have learned that time is available on Melville; they had previously not been on the schedule because it was <u>full</u>. DPP requested, and we scheduled, <u>45 days</u> in 1983 (not 90), and another 110 days for them in 1984.

In addition, an un-scheduled request from Arnold Gordon, which could not have been met without the DPP program to justify getting the ship to South Africa, adds another 37 days, and a DARPA request adds 60. Dugdale added 36 days for OPUS, cancelled them today. With other bits and pieces, the "underscheduled" ship now has 360 days requested for 1983; with possible dropouts (we have

not yet had our ONR review, and there are still some hangfires at NSF) I anticipate about 300 to 330.

Unless the committee is privy to information that is being concealed from us, softness is not anticipated in 1984. We start with 110 days (discount it to 80?) from DPP, and about 30 for MANOP (or do you plan for them to lose the lander?). APL/UW has asked for about 30 days Sandia funded for project ISHTE, Dale Good (NOSC) anticipates a month for the project previously scheduled for 82, Knox has requested a month for "Tropic Heat", and OPUS may still fly. With 60 days out for biennial overhaul, this leaves 30 to 70 days open for scheduling. I don't know whether this would generally be considered "hard" or "soft" at other institutions.

Over the past 10 years (including 1982, when we have gone through some major overhaul work) MELVILLE has averaged 220 days a year, which is 85% of the "full utilization" figures given by NSF. If the demand for class A and B ships is only for 5 ships, which is a prediction of 83%, Melville is average. This includes a one-year layup in 1979/80, in the averaging. Better work out the figures for some other ships. We will try to do better in 1983, 84, and subsequent years.

On page 21, it says "past performance and possible future difficulty with cycloids and shafts make MELVILLE more vulnerable than other Class A or B ships...." I can document cycloid/shaft problems in the past. In the first few years there were significant problems with cycloids on Melville and Knorr, culminating in replacement of the drive gears, in 1972. Since that time the only work has been regular inspections, replacement of seals, occasional replacement of nicked and broken blades, and tightening or replacing nuts. Replacement of blades and seals (and tailshafts, which fortunately these ships lack) is a rather normal procedure on all of the UNOLS ships. Did anyone check the relative count of events? Last fall, there was a sudden panic about ominous thumping noises heard from the Melville's aft cycloid. The concern was understandable, since it followed upon a number of other problems elsewhere in the ship. In the final analysis, however, it was found that the noises came from a clutch, which had been damaged by a misaligned shaft. There was no problem in the cycloid. I cannot speak for the history of the cycloids on Knorr, and I know that they had to replace distorted bladecaps on their aft cycloid in 1982; we checked for similar problems on Melville this summer, and found no signs of any problems other than normal hull corrosion (which was remedied). I enclose a copy of the chronology and inspection report.

The shaft problem on Melville, which had been allowed to get out of hand because we had a series of very temporary chief engineers who didn't understand the ship, has been found, corrected, and a maintenance and inspection doctrine established that should catch any future effects of ship warpage. I assume that WHOI has done the same for KNORR. Question: has anyone worried about the extremely long shafts on Oceanus, Endeavor, and Wecoma?

Item 3 is a very poor joke. Most projects that require Melville or Knorr can't use Thompson, which has no traction winch, poorer maneuvering capability, poorer stability for polar operations, can only carry 19 in the scientific party, and has less laboratory and deck space. The same applies to the statement on page 27 that a replacement of Velero IV by a "class C ship" would replace some parts of the Melville schedule. If there are projects that could be handled by a Class C vessel (or by Velero IV) on Melville, other than transit trip projects, I have yet to recognize them.

Item 4 is, regrettably, true. The budget for Melville in 1983 is 0.1% higher than Knorr, and is equal to 1.5 (Wecoma) or (Cape Hatteras + Cape Florida + Velero IV). I submit that it is more than worth it. I could, of course, make it cost less than Knorr by a simple bookkeeping switch--reduction of the amount per operating day that we set aside for the next overhaul by $20. Would that change your recommendation?

Sincerely,

George Shor

requiring such vessels in the near future. Therefore, the Advisory Council reluctantly recommends the reduction of Class A by one ship after 1983, unless major new scientific initiatives are funded that will result in excessive scientific queuing for the use of Class A and B vessels in 1984 and beyond.

We so recommend because:

1) This retirement will return a large fund to NSF for scientific research and better operation of remaining vessels.
2) Class B vessels will probably be fully scheduled for the next few years because of their special capabilities.
3) Modest queuing for the large, most capable facilities, is appropriate in times of funding stricture. This will be tolerable with 5 Class A and B ships unless new scientific initiatives are funded.
4) Since 1980, five ships in these classes have met the needs of funded science. Therefore, five ships (less time devoted to ALVIN use) may be sufficient, if scientific funding levels remain consistently low.

On the basis of information available in August, 1982 (Figure 3.1, Table 3a), the Advisory Council tentatively recommends retirement of R/V MELVILLE. The reasons for this choice are:

1) Consistent difficulty in keeping MELVILLE fully scheduled. Her full schedule in 1983 results from ~~90~~ 45 days Polar Programs time added after completion of the UNOLS scheduling ~~process~~ meeting in which several programs scheduled earlier dropped out (lack of funding = double-booking); additional Polar Programs use probably would not occur until 1985. Softness for 1984 is not anticipated, since a significant backlog of requests is now on hand. ~~similar to experience in the late 1970's and early 1980's~~.

60 days DARPA time, plus additional NSF and ONR requests

time (180 days) has been requested for early 1984.

2) Past performance and possible future difficulty with cycloids and shafts make MELVILLE more vulnerable than other Class A or B ships. There were problems with the cycloids prior to 1972, with only minor problems since, and shaft problems once (1982). The latter problems, of course, apply also to KNORR, ~~although she has maintained a higher standard of performance~~ which had cycloid problems in 1982, and to shafts and propellors on other ships.

3) Each coast retains a Class A vessel if MELVILLE is retired, although the "Class A" vessel on the west (Thompson) has lower berthing capacity, no trawl winch, and no safeguards against radioactive contamination.

4) MELVILLE is one of the most expensive ships in Classes A and B. Its retirement would free $3.0 million in 1984 for other uses, equalling the cost of Cape Hatteras, Cape Florida, plus Valdez, or 1½ times Wecoma, or 0.12 more than Knorr.

This tentative recommendation is for a major change in the UNOLS fleet. It should be reviewed by the Advisory Council again in the summer of 1983 in the light of actual 1982 and 1983 operations of all ships in Classes A and B and better estimates of funding and usage for 1984 and beyond. Such a review may, in fact, indicate demand for all six of these vessels in order to maintain a healthy U.S. program in oceanography. Anticipated possible sources for increased utilization of large vessels include ONR Special Research Opportunity funds.

After this 1983 review, a firm recommendation will be made as to whether an A or B class vessel must be retired or several smaller vessels, and specifically which vessel, ~~the MELVILLE or one of the others~~.

The present complement of special capability large vessels (Class B) is sufficient to meet the projected scientific needs in the near future. The SEA BEAM systems in the WASHINGTON and proposed for the CONRAD and ATLANTIS II are currently of major importance to the Geology and Geophysics community but future uses by biologists, chemists and physical oceanographers may grow. The backlog of high quality Geology and Geophysics projects that can use these tools is sufficient to keep demand high until possible use by other disciplines increases. The multi-channel seismic (MCS) capabilities of the CONRAD and WASHINGTON are essential tools for modern geophysics. While it is

CHRONOLOGY OF REPAIRS TO

VOITH CYCLOID PROPULSION UNITS

R/V MELVILLE

DATE	LOCATION	SUMMARY OF WORK
Jan. '69	Ft. Lauderdale, Fl.	Repaired reduction gear bearing.
Oct. '69	Jacksonville, Fl.	Repaired loose blade caps on after cycloid.
Feb. '70	Campbell Marine San Diego, Ca.	Repaired blade bearing, after cycloid.
May '70	Campbell Marine San Diego, Ca.	Regular Overhaul Replaced kinematics in after cycloid.
Oct. '70	Taylor Smith Co. Port Louis, Mauritius	Replaced blade seals, and replaced studs and nuts on after cycloid. Studs and nuts were manufactured by Fuji-Denki (Japan) and were installed in the blade bearing caps and drive flange (driving sleeve) of after cycloid.
Jan. '71	Taylor Smith Co. Port Louis, Mauritius	Replaced ring gear after cycloid.
Mar. '71	Afric Marine Mombassa, Kenya	Repaired propeller support in response to reported problem in Knorr.
Mar. '72	Campbell Marine San Diego, Ca.	Regular Overhaul Replaced pinion gear after cycloid.
Aug. '73	Campbell Marine San Diego, Ca.	Replaced 2 blades forward cycloid.
Sept '73	Dillingham Shipyard Honolulu, Ha.	Replaced blade seals after cycloid.
Feb. '74	William Cable, LTD Wellington, New Zealand	Replaced studs and nuts on forward cycloid. Studs and nuts, manufactured by Voith (Quality A2) with rolled threads, were installed in the blade bearing caps and drive flange (driving sleeve).

ENCLOSURE (1)

CHRONOLOGY OF REPAIRS TO

VOITH CYCLOID PROPULSION UNITS

R/V MELVILLE

DATE	LOCATION	SUMMARY OF WORK
July '74	Campbell Marine San Diego, Ca.	Regular Overhaul Replaced 2 blades forward, and all blade seals aft.
Feb. '76	Bethlehem Steel San Pedro, Ca.	Regular Overhaul Replaced blade seals aft.
Dec. '76	San Diego Marine San Diego, Ca.	Replaced 1 broken blade forward cycloid.
July '77	San Diego Marine San Diego, Ca.	Regular Overhaul Replaced 5 blades on fwd cycloid, and all blade seals both units. Installed new nuts on forward and after blade caps, and new nuts on main flange on rotor.
June '80	Campbell Marine San Diego, Ca.	Regular Overhaul Replaced blade seals, gland rings, and O rings in both cycloids.
Mar. '82	SIO Marine Facility San Diego, Ca. Nat. Steel under Tech. Dir. Paul Diehl	Re-aligned after shaft to align with after cycloid clutch and main engine.
Aug. '82	Campbell Marine San Diego, Ca.	Regular Overhaul Lowered both rotors and conducted complete P/M both units. Details provided in enclosure (2).

Subj: Report of work conducted on the cycloid propulsion system in R/V MELVILLE

Location: Campbell Marine Industries, San Diego, California.

Date: 28 July - 18 Sept 1982 (ship actually in drydock 29 July - 2 September 1982).

1. The following is a brief description of major work performed on the forward and after cycloids:

   a. All blades removed and inspected. Blade bushings and blade sleeves inspected. Two forward bushings were rotated 180°. Inspected blade cap studs. All were found to be within specifications.

   b. Completely disassembled interior of both cycloid housings. Inspected pinion and ring gear, steering control rod, bushings, main babbit rotor bearing and rotor roller bearing. Gears, pinions and bushings were in very good condition. After main rotor bearing had some wear and scratches. Bearing was scraped-in where necessary. Lowered both rotors to dock. Opened up rotors, inspected and cleaned Kinematics.

   c. Removed heavy corrosion from hull rotor cavities and exterior of rotor. Conducted ultrasonic inspection of the plating in the cavity. Painted areas with three coats of epoxy. Replaced rotor zincs in after rotor and installed zinc anodes in forward rotor cavity. Note: The forward rotor cavity had no zincs previously installed.

   d. Disassembled and cleaned all steering servos.

   e. Replaced the following parts: Rotor maintenance seals, main rotor oil and water seals, gland rings, blade seals, coupler sleeve. Machined forward cycloid oil flange ring. Replaced all required "O" ring seals. Repaired cracks in skirt of after rotor and bent plating in skirt of forward rotor.

   f. The following are pertinent readings for the forward and after cycloids:

      (1) Forward:

      Ring gear pinion .30MM
      Blade movements 3.2 MM (Max Spec 15 MM).
      Ring gear bolts torqued to 2000 lbs.
      Rotor bolts torqued to 2800 lbs.

      All Kinematic bushings were found to be in "as new" condition.

      (2) After:

      Ring gear backlash to pinion 0.325 MM
      Blade movement 4.6 MM (Max spec 16 MM)
      Rotor bolts torqued to 3600 lbs.
      Ring gear bolts torqued to 2000 lbs.

      All Kinematic bushings were in good condition and did not need replacement.

   g. All work was performed under the direction of a Factory Technical Representative from the Voith Factory in Germany.

   h. The cycloids were dock tested on 3 September 1982. Sea trials conducted on 9 September 1982 which included a one hour full power run. All tests were satisfactory.

ENCLOSURE (2)

TEXAS A&M UNIVERSITY
COLLEGE OF GEOSCIENCES
COLLEGE STATION, TEXAS 77843

Reply to
Department of
OCEANOGRAPHY

23 September 1982

Dr. Bruce H. Robison,
Chairman, UNOLS Advisory Council,
Marine Science Institute,
University of California at Santa Barbara,
Santa Barbara, California, 93106.

Dear Bruce,

Your draft final report on the academic fleet has been received. Needless to say we are most pleased and encouraged that the Council found our arguments in favor of retaining GYRE in the Gulf persuasive. We will do our best, as always, to justify your continued confidence.

Your points relative to GYRE operations are well taken. We will try harder to emphasize utilization of GYRE by our own faculty and others in the Gulf area, and to give first priority to use of the ship in the Gulf and Caribbean. I am sure I can count on our colleagues in the scheduling groups to assist in this.

With regard to consolidation of research operations in the Galveston area, you are probably aware that this was tentatively investigated a couple of years ago but not pursued. We have been in contact with Dr. Maxwell of the University of Texas, and I feel that the climate is much better now for reopening negotiations. Your nudging us in this entirely logical direction is appreciated.

I provided earlier some general comments on the first draft, and see that some of these were reflected in the present document. Other remarks are still valid, and I am sure you will give them all the consideration they merit.

Personally, I'd like to commend you for being able to arrive at a set of recommendations -- something which I was not able to get people to do earlier. While I might not agree with everything you propose, you deserve tremendous credit for coming up with a plan of some sort.

Sincerely,

T. K. Treadwell

cc: Mr. Barbee, Dr. Spencer, Dr. Maxwell

Great Lakes and Marine Waters Center

Great Lakes Research Division
Michigan Sea Grant Program
Great Lakes Resource Management Program

Alfred M. Beeton, Director

September 30, 1982

Captain William D. Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Dear Bill:

Thank you for sending the revised draft recommendations of the Advisory Council and the notice of the 15 October meeting in Washington.

Although I will not be able to attend the meeting myself, I am trying to arrange for Michigan to be represented. We are concerned with the problems facing the entire UNOLS fleet, and we want to be active participants in their resolution.

I have several comments about the revised recommendations. First, I was pleased to see that the Great Lakes have received their due recognition as one of the Nation's coastlines and that the Laurentian is included as a Class E vessel in the UNOLS fleet. We are looking into new ways to become more cost-effective in our vessel use in the Great Lakes. One way that is being considered is creation of a Great Lakes consortium of ship users along the lines of the Northeast consortium

Second, we in the Great Lakes continue to suggest that projects funded by Federal agencies in addition to NSF and ONR be considered eligible for UNOLS support. If this suggestion is properly explored, it could result in the UNOLS budget being augmented by contributions from agencies such as EPA, NOAA, and Corps of Engineers.

Third, I am distressed that the funding problem is so dire that any ship, and especially a ship having the capabilities of the Melville, must be laid up. In the present and foreseeable economic climate, it is unlikely any ship, large or small, which is lost from the UNOLS fleet will be replaced. Such diminishment of our National research resources may well be irreversible. Perhaps extreme measures of this nature are needed to bring enough attention to the problems facing ship operations to increase their budgeted funding.

Sincerely,

Phil Meyers

P. A. Meyers
Acting Director

PAM:jh
cc: G. Gamota

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INSTITUTE OF MARINE RESOURCES
OFFICE OF THE DIRECTOR

MAIL CODE A-028
LA JOLLA, CALIFORNIA 92093

1 October 1982

Captain William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

Dear Captain Barbee:

I have just read the draft report forwarded to UNOLS Members for comment by Chairman Robison. I am also aware of George Shor's letters documenting errors in reference to Melville's condition and schedule status.

There are only two ships (following shift of Atlantis II to Alvin tending) in the U.S. Academic research fleet which can handle large equipment items, and operate effectively in bad weather; these are Knorr and Melville. To retire either of these permanently would severely cripple our national deep sea oceanographic capabilities.

In my own experience Melville has been a very successful wide-ranging ship. A good example was the Indomed expedition in which I led the multidisciplinary first leg (a MANOP site survey operation) in October 1977, after which she crossed the Atlantic and the Mediterranean to work successfully for Geosecs in the Indian Ocean. I had another leg, deep towing in the Mediterranean in mid-1978 and then on her way home used her again on two multi-group geophysics and Alvin legs on the EPR at 21°N in the spring of 1979. Melville has proven herself in Antarctic waters in several Drake Passage operations and polar program biology. From successful support of Geosecs to the presently scheduled complex DARPA equipment handling operations and the 20°S Deep-tow work scheduled for 1983 her capabilities have been and continue to be needed.

The idea that these two ships and R/V Thompson could in any sense be considered interchangeable seems strange, to say the least. Thompson may be perfectly good in her own way, but she has no record of successful worldwide operation, cannot hold a large scientific party, is of a class which prudent operators would not send to the Antarctic and, unlike others of her type, she has no deep sea winch for dredging, trawling or handling near- or on-bottom systems such as Deep-tow, Angus or RUM III. There is no significant Melville or Knorr expedition that I can recall which could have been carried out on Thompson.

It seems to me that the first order of business is to make a concerted effort to convince the sponsoring agencies that there are ways of making up what this report appears to project as a 4 million dollar shortfall. If that is unsuccessful, and if there is a new rule among us that says that all current operators must forever have at least one ship, then it would make more sense for UNOLS to recommend transfer of Washington or Melville to the University of Washington, with retirement of Thompson. This would certainly leave those of us who intend to continue and expand our involvement with sophisticated near- or on-bottom deep ocean activities and multidisciplinary operations in a viable condition, rather than all of us having to use a single east-coast-based ship.

The implication of much of this, including my own remark above about convincing sponsors that they should make up the shortfall, is that somehow "the fleet" must be funded on some completely block basis rather than that the operating insitutions and the scientific users should go out and sell their sponsors on new programs, and that the users as individuals should decide on which ships are most useful through the medium of making their requests for the particular ship or type of ship which is best for their work. We seem headed for a bureaucratic era in which some small group will decide what the fleet composition should be, rather than letting the marketplace decide.

As one investigator who plans to continue near-bottom work and to move toward a need for on-bottom manipulative capabilities I feel strongly that we should keep both Knorr and Melville in operation - they represent a national asset with capabilities not duplicated (as the standard AGORs are) in either the Navy or the NOAA fleets.

Sincerely,

F N Spiess

Fred N. Spiess

CC: George Shor
Roger Larson

rh

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INSTITUTE OF GEOPHYSICS AND
PLANETARY PHYSICS, A-025
SCRIPPS INSTITUTION OF OCEANOGRAPHY

LA JOLLA, CALIFORNIA 92093

1 October 1982

Captain William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

Dear Captain Barbee:

I have read a copy of the UNOLS Advisory Council "Report of the UNOLS Fleet Workshop, August 18-20, 1982" first with disbelief, then several more times with increasing levels of anger. If the proposals contained in this document actually take effect, American oceanography will have been dealt a severe and thoroughly unnecessary blow. These proposals already have acquired great mass and momentum, and I am not optimistic that an individual letter such as this can do much to derail them, but I must at least try.

I concede the principal opening argument, that funding for ocean science is insufficient and that the UNOLS fleet must be trimmed, shortsighted though this is as a matter of national policy. Whether or not the federal agencies (NSF, ONR) have been energetic and politically astute in trying to correct this situation, or have simply accepted it as a *fait accompli*, is a separate question. Close study of it would be enlightening, but let us set it aside for now. How, then, to go about distributing the damage dictated from on high?

The report begins by defining classes of vessels. As in many other areas of life, control of the agenda or terms of discussion is critical. We find that a "Class A" has been set up including *Knorr*, *Melville*, and *Thompson*. Nice try, but it just won't work. There is really only a two-ship class at the top, *Knorr* and *Melville*, and there are numerous important scientific programs which can only be accomodated on one of these two ships for reasons of scientific party size and/or load-carrying capacity and/or deck space, etc., etc. In addition *Melville* has been kept radioactively clean, for geochemical work involving low-level radioactivity in natural isotopes. I will not enlarge this letter by listing details of all these programs; no doubt scientists involved directly in them will write separately. Indeed, I have never sailed on *Knorr* or *Melville* myself, though I do have a pending proposal which requires use of one of them in 1984 and 1985. But I think I know enough about the kinds of science which these two ships support to realize that they are in a class by themselves, not parts of a three-ship class and still less parts of a six-ship ("Class A & B") mob.

It therefore follows that the recommendation to retire *Melville* is not a proposal to cut "Class A & B" by 1/6 but rather a proposal to cut the true top class by 50%. 50% is hardly a "modest undersupply" (p. 11) if viewed in these terms. All the words which go into defining Classes A and B, then into lumping the two together, and finally into cutting out *Melville*, are intended to obscure these facts and to soften the blow, but they deceive nobody.

One might expect to find that the proposed reduction of first-rank ships from two to one would be based at least in part upon close study of projected use for these ships. After all, as the report admits. such ships are "the backbone of the U.S. academic, blue-water, global research fleet," and one should not lightly excise one verterbra from a two-vertebrae spine. But Table 2c seems to support a very different conclusion. "Classes 1 and 2," which include the same ships as A and B, have low numbers of excess days, while the small ship classes, (4 and 5) have substantially larger numbers, by factors of three to four. Footnote 4 struggles to excuse this situation, but the lack of data to support its claims makes it less than compelling, and in any event it is hard to credit such excuses to the extent of factors three to four. And if we do credit footnote 4, presumably we may also credit footnote 1, which improves the big-ship efficiency picture.

At this point the innocent reader might suppose that, in the face of the projected use figures, the small ships will be recommended for a drubbing even more severe (by a factor of three to four?) than the big ships, to keep things equitable. Instead, he finds a proposal for a change of funding mechanism (item 4, p 15) which, it is later admitted (p. 31), "represents no financial saving." Now even the most innocent of readers must see what is going on. In starkest terms, it is this:

1. No operating institution should lose its only ship
2. Since most single ship institutions operate small ships, this defines great numbers of small ships as exempt from cuts
3. Therefore the only way to save enough cash is to clobber a big ship.

Now premise #1 is eminently democratic and worthy, and I am sure nobody doubts that it is a Good Thing in the abstract. So is additional funding for the fleet. But we are not dealing in abstractions; we are dealing in the real effects of accepting premise #1 and following it to its logical conclusion. That conclusion, loss of 50% of the premier class of ships, would be devasting for U.S. oceanography, and anyone who thinks it could be rapidly repaired or undone at a later date is a fool. It is almost unimaginable that any ship resembling *Knorr* or *Melville* could be converted or built from scratch in this country in less than a decade, counting all the time needed to secure funding, plan the ship, etc. Resurrecting or building smaller ships later if funds increase is a far more likely and quicker process, since the necessary increments are smaller and the construction is less complex.

When the premise leads to such a result, one must back up and re-examne the premise. Why must all operating institutions continue to operate? What actually happens if one or more drop from the list? It is important to examine this question closely. The statement on p.18 derived from the NAS-OSB report and used as the basis for keeping all operating institutions going says that we should "continue the type of operation which does not separate seagoing oceanographers from the responsibility for management of research vessels." Fine. But is it true that a sea-going oceanographer at Institution X can have no "responsibility for management of research vessels" if X has no ship? Hardly. We already have regional and other scheduling groupings in which important inputs are made by scientists not affiliated with the operating institutions of the vessels in question. Surely scheduling is part of vessel management. The concept is capable of extension. For a small fraction of the money saved in proposed cuts, UNOLS could fund travel of scientists to operating institutions in order to meet with marine operations groups there, plan expeditions, etc. It is simply not true that the only way to follow the NAS-OSB advice is to not let any operating institution drop from that status. I submit that the whole problem should be readdressed with this idea in mind, it opens up many more ways to achieve the necessary economies. The iron boundary condition which emerges on p. 18 is that the highest good is "maintaining the maximum number of effective ship operating institutions," and that this is vital "regardless of budget levels;" this is clearly the sense meant to be conveyed. It is just not so. In fact, if carried to extremes, it becomes ridiculous. Suppose funding were so tight that there were only, say, six operating institutions each with a class D-F ship. There would be no blue-water capability worthy of the name. But by substituting one class C ship for two or three smaller ones, a national ability to study the deep ocean could be achieved. Does anyone seriously believe that it is more important to keep all six small-ship operators in business than to allow the nation to learn about the global ocean?

On the subject of specific reasons for nominating *Melville* for execution, I will say little. Some of the arguments presented are silly, some have slightly more substance, and all have been addressed capably by George Shor in his September 27 letter to you. Again the argument that "each coast retains a Class A vessel," when in fact one of two top-class vessels has been removed, appears; it does not gain validity by repetition.

Finally, it astonishes me that the following approach was not even mentioned, let alone proposed. Let us concede (as I do not) the argument for retaining all operating institutions, and let us then conclude that we must get rid of a big ship. At very little difference in dollars, one could transfer *Melville* to the University of Washington and retire *Thompson*. No operating institution would be out of business, and the capability of the fleet would be enormously greater. But this is only of a very large number of astonishing features in the report.

Sincerely,

Robert A. Knox
Associate Research
Oceanographer

cc: G.G. Shor
Dr. D. Spencer

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF GEOLOGICAL SCIENCES

SANTA BARBARA, CALIFORNIA 93106

October 5, 1982

Mr. William Barbee
UNOLS Office, WB-15
University of Washington
Seattle, Washington 98195

Dear Mr. Barbee:

I have kept close track of the development of recommendations for adjustments to the academic fleet in the face of reduced federal funding. I am a member of the Ocean Science Board and was a reviewer for the Mullin OSB report on fleet recommendations. I carefully read the initial draft of the UNOLS Advisory Council report on possible scenarios for ship lay-ups which was circulated during July. I agreed with its carefully considered recommendations that the least damage to the fleet could be accommodated by the retirement of several mid-size ships, a conclusion consistent with background material presented in the OSB report on "Academic Research Vessels 1985-1990".

I am shocked and dismayed by the sudden reversal of the recommendations presented in the latest draft of the UNOLS Advisory Council report, which retains the mid-size ships at the expense of laying up Melville. Taken together, Melville and Knorr are unique, invaluable, and irreplaceable national resources for oceanographic research. As deep sea research becomes more sophisticated with towed and remote instrumentation as well as highly detailed studies, the demand increases for large, highly maneuverable research platforms. This demand will increase in the future while the need for ships which have difficulty maneuvering or maintaining station is likely to decrease. Laying up either Melville or Knorr would represent a misinformed large step backward in the make-up of the academic fleet. I have used Melville as Chief or Co-Chief scientist on 8 legs, and have been highly satisfied with its performance in each case. Its poor performance in 1981 was due to an unfortunate series of errors which have been remedied. The one time I was left with no choice but to use a mid-size vessel when I needed Melville or Knorr, my scientific program was seriously compromised as well as the safety of some scientific personnel and equipment. I would not settle for such a compromise again.

I am in total disagreement with the present draft of the report of the UNOLS Advisory Council, and urge them to return to their original position.

Sincerely yours,

Ken C. Macdonald

Ken C. Macdonald

KCM:ed

UNIVERSITY OF CALIFORNIA, SAN DIEGO

ISOTOPE LABORATORY A-020
SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIFORNIA 92093

TELEPHONE: (714) 452-3260
TWX NUMBER: 910-337-1271
CABLE ADDRESS: SIOCEAN, LA JOLLA

4 October 1982

Captain William Barbee, Executive Secretary
UNOLS Office -- WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Dear Sir:

I have just seen the UNOLS draft report which recommends the retirement of R/V Melville. As one of the remaining non-large-program users of Melville, I am appalled at this suggestion. With Atlantis II being refit for ALVIN mothering, Washington dedicated to Seabeam use, etc., I think this is a very serious error in judging future work in oceanography. Every year we have more difficulty in scheduling deep-water oceanographic research, and the number of near-shore oceanographers continues to increase. The type of work that I and many others at SIO do would suffer badly if Melville were retired. This would be especially ironic in view of the excellent operating condition which we now have for Melville. As I leave for the first leg of BENTHIC Expedition--aboard Melville--I hope very much that UNOLS will look seriously at the scientific work accomplished on Melville in the past several years and reconsider. It is the Class C ships which should be eliminated, and their programs merged on to the Class A and B ships -- this is the efficient way to run a fleet of oceanographic ships.

Sincerely,

H. Craig/vkc

H. Craig
Professor of Geochemistry
and Oceanography

cc: D. Spencer, WHOI

hc/vkc

DEPARTMENT OF EARTH AND PLANETARY SCIENCES

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

October 6, 1982

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

Dear Captain Barbee:

A copy of the draft report of the UNOLS Advisory Council Fleet Workshop (18-20 August 1982) was forwarded to me recently by Drs. Knox and Shor of Scripps along with cover letters expressing concern that the report recommends retiring Melville from the UNOLS fleet. I share their concern, since the loss of the Melville would have serious impact on large ship availability, particularly in the Pacific. As a physical oceanographer, I will express concerns relevant to the type of work I do, and leave oceanographers of other persuasions to do the same.

My colleagues and I do deep ocean moored array work, often in remote regions of the ocean. Such work requires ships with large amounts of deck space and large deck load capacities. With the conversion of half of the large ships to non-physical oceanographic specialization (Atlantis II, Conrad, and Washington), only three ships are left which will be available to do mooring work of this type (Knorr, Melville, Thompson). Of these, Thompson is the smallest, thus least satisfactory for large scale work of this type. In the past two winters I have worked from the Thompson, setting six intermediate moorings on a cruise. This required a deck load near the capacity of the ship. Were these surface moorings, we could not have done the work, simply because of the increase in hardware. My colleagues and I have plans to set and recover up to eight moorings of the surface or near surface type in an upcoming program in the equatorial Pacific. This work requires a ship of the Knorr/Melville class. Thompson is simply too small.

Cutting the Melville from the UNOLS fleet would severely limit the scope of moored array efforts possible in the Pacific. Large scale moored arrays could be set only from Knorr under such circumstances. In practice this restricts operations to the Atlantic, where most such work has been done. The UNOLS Advisory Council recommendation to remove the Melville from the fleet is one to significantly limit our horizons of discovery.

I do not feel strongly about the distribution of ships among the UNOLS institutions. Some institutions are more effective at managing ship resources than others. My main concern is that the sort of work my colleagues and I do will be severely hampered by the removal of the only suitable ship for the projects we plan from the Pacific. Management and maintenance notwithstanding, Knorr and Melville are still the most versatile ships we have from which to carry out programs involving large amounts of hardware. I object to any plan that would delete either ship from the fleet without suitable replacement.

Sincerely,

Charles C. Eriksen

xc: George Shor
Derek Spencer

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

DIVISION OF OCEAN SCIENCE
OCEAN SCIENCE RESEARCH SECTION

October 5, 1982

Dr. Bruce H. Robison
Chairman, UNOLS Advisory Council
c/o Marine Science Institute
University of California, Santa Barbara
Santa Barbara, CA 93106

Dear Dr. Robison:

Derek Spencer just dropped off a draft copy of the UNOLS Advisory Council report on the academic fleet. I think you have all done a good job. The report is easy to read and well-focused. And, it provides lots of food for thought. Congratulations!

I understand that the final report is to be submitted to NSF and ONR on 15 October, and in reading it through I found a few places where minor revision or clarification might be useful. One is just a simple edit in Table 2a (p. 10) which shows "Oceanus" as the institution operating the Oceanus.

A more significant error which ought to be corrected (to protect the innocent, put the blame on the guilty, or give credit where credit is due) is the frequent reference to the NSF/ONR Task Group - or in some places - Task Force. It was in fact solely an NSF Task Group and its activities and products should be so referenced. Places in the text where I noted this error are: p. 8 - top, p. 10 - footnote to Table 2a., p. 11 - top - twice, p. 14 - middle, and p. 19 - Note 2 on Figure 3.1.

In the middle of page 1 of the Introduction, the statement is made that, "Additional statistics indicate that many "very good-to-excellent" proposals for marine science projects were being declined." I've attached some information from our proposal data files which doesn't appear to support the statement as put very much. Nevertheless, I believe the sense of what's being said is correct. I'd suggest you consider dropping the word - excellent - and the quotation marks and let it read - many very good proposals.

Finally, the discussion on page 5 concerning the notorious imprecision of ship use projections for the smaller classes seems overblown to me. There's no question that some imprecision is present. But, from the records I have in hand (see my attached memo with tables sent to Dirk Frankenberg last June), the "variation" cited is very questionable at

best. What is clear in the data is that these projections are generally optimistic - though probably not as optimistic as those contained in 1983 UNOLS proposals and mentioned in this part of draft report. All in all, I get the impression that equivocal statements have been included in this section to bolster the conclusion reached in the last sentence. I have no problem with the conclusion - it seems quite reasonable to me. But, I would urge deleting the sentence evidencing notorious imprecision and perhaps the sentence preceding it. In a real sense they detract from the credibility of this paragraph.

On another topic, I keep hearing good reports about the WASP from all sorts of returning travelers. It sounds like it's going very well. I'm sorry I've missed it but suspect there will be other opportunities.

Best Regards,

Original Signed By

Robert E. Wall
Head

Attachments

UNITED STATES GOVERNMENT

memorandum

DATE: September 28, 1982

REPLY TO ATTN OF: R. Wall RW

SUBJECT: Data on the Decline of "Highly Rated" Proposals

TO: OSRS Group Leaders

The introduction in the UNOLS Advisory Council's draft "Report of the UNOLS Fleet Workshop" held in August 1982, states, with regard to NSF/OCE, that "Additional statistics indicate that many "very good - to - excellent" proposals for marine science projects were being declined." I was a bit surprised at this and thought it worth looking into. The attached table is provided for your information. It's reasonably self-explanatory.

Bob

Attachment

cc: Gross
La Count

OPTIONAL FORM NO. 10
(REV. 1-80)
GSA FPMR (41 CFR) 101-11.6
5010-114

Excellent to Very Good Proposals Declined
(FY77 - 80 for OS, FY81-82 for OSRS)

	Proposals with Ave Mail Review Ratings better than Very Good (ie. < 2.0)			Ave Panel Ratings (where available) of those Declined			
FY	# Acted on	# Declined (by Program)	%	# ≥ 3.0	> # ≥ 2.5	> # ≥ 2.0	> #
77	78	6 (B-5, G-1)	8%	3	2	0	0
78	103	13 (B-1, G-9, C-3)	13%	3	3	2	1
79	123	21 (B-8, G-6, C-6, P-1)	17%	19	0	1	0
80	86	14 (B-10, G-4)	16%	8	0	5	0
81	168	13 (B-10, G-3)	8%	6	3	4	0
82	164	17 (B-12, G-4, C-1)	10%	6	6	4	0

June 11, 1982

Dr. Dirk Frankenberg
Marine Science Institute
University of North Carolina
Chapel Hill, North Carolina 27514

Dear Dr. Frankenberg:

As a background exercise for myself in putting together the ship needs projections for 1983-88, I did a quick run through of the May 1979 projections which the IDOE and OS staff provided you for your report to the OCE Advisory at that time.

Comparisons of your, my and others numbers are shown in the attached tables. The numbers clearly show that projections of this sort are a pretty squirly business and that they have tended to err on the optimistic side at least in recent years. More important to me and the main reason for writing you is the rather large discrepancies between some of our numbers. As far as I know, they were derived from the same set of data, assume a constant level of research support, and reflect only OCE's projected needs. I could easily accept $\pm$ 10% or even $\pm$ 20% in this sort of exercise. But more than that and I start to wonder what's going on. I can't explain it. If you've any ideas please let me know.

Good luck with the summer AC activity.

Bob

Attachment

TABLE 1 - Use-Day Projections by Class for CY1981 OSRS/NSF Ship Needs

Class	(1)	÷(4)	(2)	÷(4)	(3)	÷ (4)	(4)
1	1280	1.49	1190	1.39	585	921 1.07	ca 550
2					336		309
3	1520	1.77	1030	1.20	1031	1.20	860
4	915	2.03	530	1.18	542	1.20	450
5	595	0.92	835	1.30	834	1.30	643
Totals	4310	1.53	3585	1.28	3328	1.18	2812

Notes:

(1) Developed from NSF/OS and NSF/IDOE staff projections of May 1979 by Frankenberg and presented to the OCE Advisory Committee at that time. (OS and IDOE use only?)

(2) Developed from the same staff projections as in (1) by R. Wall in January 1982. (OS & IDOE use only)

(3) Developed by NSF/OFS staff from proposal and UNOLS data in December 1981. (All NSF)

(4) Developed ~~by~~ from UNOLS ~~office~~ data in May 1982. (All NSF with shift of about 130 days Knorr time to DOE for TTO)

TABLE 2 - Use-Day Projections by Class for CY1983 OSRS Ship Needs

Class	(1)	(2)	(3)
1	1200	1190	365
2	1495	1030	535
3	950	530	825
4	715	835	300
5			470
	4360	3585	2495

Notes:

(1) Developed from NSF/OS and NSF/IDOE staff projections of May 1979 by D. Frankenberg and presented to the OCE Advisory Committee at that time. (OS and IDOE use only(?))

(2) Developed from the same staff projections as in (1) by R. Wall in January 1982. (OS & IDOE use only)

(3) Developed from NSF/OSRS staff projections of December 1981 at the - 12% (81-83) decrement level as per TABLE 2 in Projections document. (OSRS use only).

SKIDAWAY INSTITUTE OF OCEANOGRAPHY
UNIVERSITY SYSTEM OF GEORGIA
P. O. BOX 13687
SAVANNAH, GEORGIA 31406

October 8, 1982

Mr. William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

Dear Bill,

I have many conceptual difficulties with the UNOLS Advisory Council's recommendation (or comments) on ship distributions and management. Unless an implicit assumption (not stated) is that the Council is recommending a reversion to "block funding" and need not be directly tied to specific justification provided by funded research projects a lot of the report doesn't make sense.

The primary consideration of the AC was obviously to protect the integrity of institutions now operating UNOLS vessels. If this is to be so, given the current funding climate, the burden of supporting the ships rests with the institution, not with any given funding agency. Contrarily NSF/ONR could agree to fully support just the right mix of ships to support only their programs. This move would drop put all "other" support which in toto is more important than that from ONR (Table 2b). Unless I've missed something completely over the past 10 years I see no difference between "protected by regular, annual proposal funding by OFS" (page 30) and "project-by-project support". Does anyone get NSF or ONR support that is not tied to specific projects and what institution does not return budgeted funds which were not committed to NSF projects (page 30)? In summary, and without endless point-by-point elaboration, I feel that if the Advisory Council is not recommending "block funding" the report is loaded with conceptual flaws and contradictions. If block funding is the recommendation the report should say so.

Specific to possible impacts of the recommendations on this Institution I repeat that I see no difference in using current OFS proposal formats or requesting support on a project-by-project basis. However, much depends on how the small ship funds are managed by NSF. Because management has been left to the Agency specific comments are difficult and perhaps useless. Finally, I can't see how a budget limit can be established for Class E and F ships. Funding levels obviously could be much higher or lower depending on specific justification, as they might be for "protected" ships.

Sincerely,

David

David W. Menzel
Director

DWM:dem

OLD DOMINION UNIVERSITY

School of Sciences and Health Professions
Center for Marine Studies • (804) 440-3939 • Norfolk, VA 23508-8512

October 6, 1982

Capt. William D. Barbee
UNOLS Office, B-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Dear Bill:

I have just reviewed the draft final report of the UNOLS Advisory Council on the composition, distribution, and use of the academic fleet for 1983-1988. Reading between the lines, I can well imagine the heated arguments that must have taken place during and in between the workshops. It is a real tribute to the members of the Advisory Council that they could finally agree (if indeed they did) to a report advising NSF and ONR how to cut their own fleet.

The introductory plea for more funding for ocean science is an essential precursor to such an exercise in self-amputation. I feel they have done a tough job well and will be interested to see how it is received by the funding agencies. The increased time for scheduling Class A and B research cruises may be necessary, but it will be fifficult for researchers to accept.

I pick my usual nits!

1) To the uninitiated, OCE, DPP, and OSOD (Note 4 of Table 2b) have no meaning.

2) The notations on Figures 3.1, 3.2, 3.3 with the arrows and "5.5 ships" etc. are not explained.

3) Good grammar requires five changes: P.8. para. 1, line 7, for "determines" read "determine",

P.18, final para., line 1, for "leads" read "lead".

Same para., line 10, for "demonstrate" read "demonstrates"

P. 22, para. 3, line 1, for "indicates" read "indicate" ('data' is used as a plural word elsewhere in the report).

P. 23, para.1, line 3, "use days" should be hyphenated.

The placement of Class E and F vessels in a separtate category to be funded makes sense; and from a selfish viewpoint, I like the concept that the sixty additional Class E and F vessels operated by UNOLS Member and Associate Member institutions would also be elegible for project funding through the proposed mechanism.

In short, the report is well done. I will be glad to hear how it fares.

Best personal regards.

Sincerely,

Harris B. Stewart, Jr.
Director
Center for Marine Studies
Old Dominion University

cc: Dean Wallace
Bruce Robinson

HBS/dcd

School of Oceanography
Oregon State University
Corvallis, Oregon 97331 (503) 754-3504

7 October 1982

Dr. Bruce Robison
Marine Science Institute
University of California, Santa Barbara
Santa Barbara, California 93106

Dear Bruce:

I really don't have too many comments to offer on the final draft of the AC report on the fleet workshop.

The AC's stand on the MELVILLE is sure short of a definite recommendation; you're not living up to your charge from NSF and ONR. You should be making a firm recommendation as requested. Any such recommendation would be subject to review if the scene changed in 1984, anyway. But you guys should take a stand -- so it hurts. You know you can't win in this type of situation.

I find it hard to believe that when one considers the fleet as a whole that the VELERO IV doesn't end up on a hit list. Her limited capabilities, especially the lack of bow thruster make her less suitable for many projects than a number of other vessels. Since I cut my first oceanographic experiences on the VELERO IV, she has a soft spot in my heart, but it doesn't look like the AC really gave that one the thought needed. I suspect most of you on the AC feel that she should go, but you did not want to take a stand any stronger than you did. To recommend eventual retirement is a statement you can make relative to each of the UNOLS vessels. I suspect the lack of a strong position doesn't help NSF and ONR that much.

Overall, I do see a much more rational approach than that set forth in the earlier draft. I have made a number of comments in the margins of the report which may or may not be of any value.

I think Art Maxwell raised a number of points in his letter that should give the AC food for thought.

All the best,

George H. Keller
Associate Dean

cc: Capt. Wm. Barbee

University of Hawaii at Manoa

Hawaii Institute of Geophysics
2525 Correa Road • Honolulu, Hawaii 96822
Cable Address: UNIHAW

Office of the Director

October 8, 1982

Dr. William D. Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Dear Dr. Barbee:

Attached for your information are comments and suggested alternative recommendations which represent the University of Hawaii position on the UNOLS Advisory Council's final draft report on the academic fleet.

Most sincerely,

Charles E. Helsley
Director, HIG

CEH:ko

cc: NSF-OFS
ONR
UNOLS Membership

UNIVERSITY OF HAWAII

COMMENTS ON THE UNOLS ADVISORY COMMITTEE REPORT

ON THE UNOLS FLEET

The preamble of the report focus us on the real issue; namely the inordinate effort that has gone into reducing the fleet size and capability over the past half decade without an equivalent effort aimed at emphasizing the need and benefits for maintaining a vigorous oceanographic program. Earth and ocean sciences have changed in the past decade, but, if anything, their importance has increased rather than decreased as one would conclude from simply looking at the general level of support provided. This is especially true for the support available for oceanographic research--both for science and facilities.

The overall report attempts to respond to the charge given the committee; however, its usefulness appears to have been compromised by both the shortcomings of the charge and the data provided to the committee. The major issue is: Does the report accurately depict the level of funding available? Does the projected usage mix between A, B, C and D categories really reflect the true need for vessels? In our opinion, the funding picture is strongly biased by the ONR and NSF funds available and does not adequately represent the category generally referred to as "other." It is probable that at least 1 to 2 class "C" ship years are funded from the other category at present, and if so, there is no reason why this should not continue to be the case. Not all of this is "pure" science, but by providing support for vessels needed by "pure" science it is both useful and good for science in general. Moreover, the data gathered during these "applied" programs often contribute directly to the information pool needs of "pure science." Since most of the "other" funding goes to the class "C" and "D" vessels, there is nothing to be gained by reducing the number of vessels in this category--one is simply decreasing

the overall level of funding available, for it is unlikely this work will transfer to the larger, more expensive ships. On the other hand, some of the work now done by the "A" and "B" ships can be done by "C" ships often in a more cost effective manner. Thus, it is apparent that an error has been made by the Advisory Council when they concluded that there are too many class "C" ships.

Examination of committee report Figure 3.2 (p. 24) tends to confirm this for there appears to be a strong 1:1 correlation between the number of days used and the number of days available in the "C" category. In fact with the exception of 1978 and projected 1983, there are always more actual days than available days. This strongly suggests that class "C" ships are <u>always</u> fully utilized. Such a correlation is not present in the "A" or "B" categories where a chronic surplus of one ship is always present from 1979 on. We submit, therefore, that we should maintain the present complement of class "C" ships (substituting the MOANA WAVE for the KANA KEOKI as has long been contemplated by the University of Hawaii upon completion of the Navelex assignment). This would mean retaining 7 class "C" ships rather than the 6 suggested by the advisory committee.

The issue of funding for this "extra" ship can be solved by budgeting a 10 percent shortfall for all class "C" ships. These funds will come from unanticipated "other" sources such as DARPA, JOI Inc., oil companies, or state (or institutional) sponsored programs. The other 4 percent will of course come from work that would have gone to more expensive (larger?) ships.

<u>Class "A" Vessels</u>

Large ships are a different problem. The advisory committee has misled itself by separating these ships into two misleading and self-serving

categories: "national assets" and " special purpose (dedicated)" ships. In reality these ships are (1) large multipurpose and (2) intermediate-focused research ships. The tacit assumption that the ATLANTIS II is to be the ALVIN tender has further biased this discussion. Let us first look at the ALVIN issue.

The ALVIN can, in theory, be handled by many ships. Two ships presumably had ALVIN support in mind when they were designed; namely the MELVILLE and the KNORR. Why then convert the ATLANTIS II for this purpose? The recommended conversion is apparently driven by the desire to find some "dedicated" purpose for the ATLANTIS II, for if such a future is not identified she is clearly a candidate for retirement. Why not make the necessary conversions to the KNORR and MELVILLE? This alternative would not only remove one large ship, the ATLANTIS II instead of the MELVILLE, but it would also provide work for one-half ship year per year for the remaining large ships. Since there appears to be need for the other one and one-half ship years of large ship capacity, this solution should serve the community well. It has two other benefits as well: (1) both highly maneuverable cycloidal ships are preserved; and (2) one large multipurpose ship is kept in each ocean, and thus the amount of wasted transit time will be minimized. Moreover, it would provide greater flexibility in scheduling of ALVIN dives in various parts of the world, for the ALVIN could be shipped to join whichever ship would be in the appropriate area. There would be an added cost of $800K to $1 million for the second set of handling equipment and modifications, but this cost would probably be made up the first year by reduction in transit costs inherent in the "one mother ship" concept.

It should also be noted that the ALVIN can also be handled from the GYRE

or the MOANA WAVE, at least in theory. I don't know the conversion cost numbers but expect the lower operating cost of these ships would rapidly amortize whatever the cost might be. Incidentally, a stretched MOANA WAVE or GYRE would have more than enough lab and crew space to provide the necessary support functions.

To summarize recommendations concerning the large multipurpose ship category (KNORR, MELVILLE and ATLANTIS II), it is recommended that the ATLANTIS II be retired and use of the KNORR and MELVILLE as ALVIN support vessels as appropriate. Should there be inadequate work for the two remaining large ships, which is doubtful, then one could consider alternating lay-ups or extended maintenance periods as appropriate. Temporary lay-ups of these two ships, if necessary, should have minimum impacts for both operating institutions operate several large ships, and thus crew rotation and dock-side maintenance would tend to minimize loss of key personnel.

Class "B" Vessels

The issues with the intermediate-sized focused function ships (CONRAD, THOMPSON and WASHINGTON) have been biased by the presumed "uniqueness" of these ships for multichannel seismic (MCS), physical oceanography and seabeam, respectively. It is true that these capabilities are special, but hardly unique, for other ships can, and do, perform in these same capacities. Moreover, each of these ships is capable of general purpose work. Therefore all of these ships continue to be needed but none should be considered sacred. Their cost of operation is substantially greater than the class "C" ships but considerably less than the three large ships. Since their scientific capability is not much greater than the class "C" ships, but their cost is considerably more, they should be the prime targets if further lay-ups

(beyond the ATLANTIS II) are considered.

Research Vessel Reassignment

The advisory committee's recommendation for assignment of the ISELIN to Hawaii is illogical. All class "C" ships are not equal and surely institution factors such as make up of the sea-going faculty must be considered in such a recommendation.

The ship users in Hawaii are generally in four disciplines: Biological Oceanography, Chemical Oceanography, Marine Geology and Geophysics and Physical Oceanography. The average annual usage of the KANA KEOKI for the period 1977 through 1981 is 248 days per year, with a disciplinary distribution of approximately 30, 30, 120, 30, respectively, with 40 days provided by other UNOLS users. This work is primarily in the Central and Western Pacific but also has included substantial work in the Eastern Pacific and even the Atlantic (see attached ship track map). Since more than half of this work is in marine geology and geophysics, the ship has been, and needs to continue to be permanently equipped for general purpose marine geology and geophysics work. At the same time it needs to be available for biological, chemical, and physical oceanographic work and thus must have a variety of laboratory areas available as well as large A-frames, trawl winches, hydrographic winches, etc. Experience on the KANA KEOKI has taught us that at least 1200 square feet of laboratory is necessary to provide for the minimal needs of this diverse group of scientists.

An added constraint, at least as far as we are concerned, is that the ships have adequate space to handle the SeaMARC II mapping system recently developed by the Hawaii Institute of Geophysics. This requires an extensive computer facility, dark room, signal processing and EPC recording facility, work

space for making of mosaic maps, and deck space for a van, capstan, handling winches, and the towed portion of the SeaMARC system itself. As stated above, the space available on the KANA KEOKI is sufficient but very marginal for this purpose. We thus are convinced that, wheatever ship we operate, it must be capable of being a general purpose oceanography vessel but at the same time must be able to support a substantial marine geophysics effort including the SeaMARC II system.

Examination of the data available on the RV ISELIN suggests that the current layout of the ship would not accommodate this diversity of activity. The present laboratories are too small and could only be increased at the expense of reducing the open-deck area. Adequate laboratory facilities could be made by enclosing all of the starboard forward deck. Installation of the large Markey winch currently on the KANA KEOKI would consume about 12 feet of the starboard fantail leaving less than 25 feet of usable main deck area. This compares to the 36 feet currently on the KANA KEOKI, which is by experience altogether too small.

Thus we conclude that even an extensively modified ISELIN would be inadequate to accommodate the diversity of science that is currently been done by scientists in Hawaii. We therefore recommend that our request to use a modified (stretched) MOANA WAVE be considered carefully for it not only replaces the KANA KEOKI with a ship of comparable operating cost but would provide space for an adequate scientific party (greater than 20), the necessary laboratory space and diversity of laboratory spaces, and adequate deck space for large deep-sea trawls, SeaMARC II, moorings, and other general oceanographic activities.

What, then, would become of the ISELIN (or the CAPE FLORIDA if that is the University of Miami's desire)? The advisory committee suggests that a

new ship replace the VELERO IV in 1986. If Miami or UNOLS does indeed have a surplus of ships, why would anyone suggest building a new one in the same report that recommends removal of three existing vessels! The logic of this recommendation is certainly not evident particularly when the difference in operation costs between the CAPE class and Class "C" vessels is so small. Surely a more responsible suggestion would have been to retire the VELERO IV as soon as is reasonable and replace her with either the CAPE FLORIDA or the ISELIN leaving the remaining vessel at Miami. This course, however, should only be followed after a careful evaluation of Miami's program requirements and the long-term need for the ISELIN and the CAPE vessels on the east coast. In any case, one should surely reassign an existing underutilized ship before building a new one.

The misinformation given the committee about the reconversion of the MOANA WAVE requires clarification. By terms of the contract with Navelex (through the Military Sealift Command), the MOANA WAVE is to be reconverted to its original configuration and returned to Honolulu at Navelex expense. The cost of this reconversion has been estimated by a marine architect as $2.1 million which is comparable to the internal estimate made by Navelex previously. Navelex assures us that there is not a budgetary problem; the only issue being what changes are, by mutual agreement, to be omitted. Thus the statement on page 23,"These changes are unlikely to succeed within the budget proposed by Navelex," is totally without basis.

The cost of stretching the MOANA WAVE is estimated to be about $910,000, including marine architect's fees. The cost of increased habitability and lab space is estimated at an additional $225,000. The cost of the stretch and other modifications would, of course, have to be borne by NSF, ONR and

the University of Hawaii. However, the total cost of $1,135,000 is comparable to that being spent on other "mid-life" refits and is probably not much greater than the cost of outfitting some other ship, such as the ISELIN, for the scientific programs to be recommended in the Central and Western Pacific.

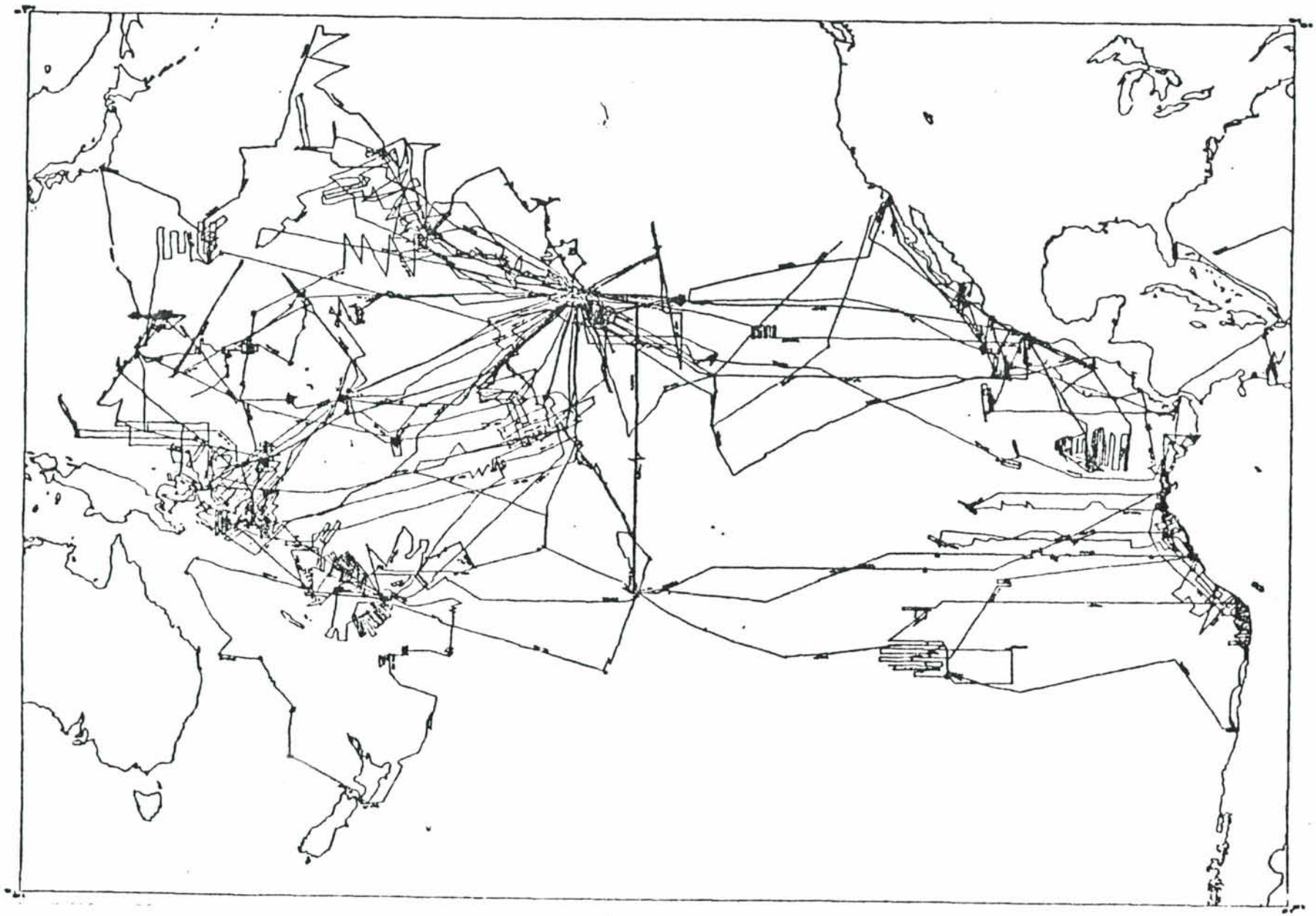
Summary

It is recommended that the Advisory Council reconsider their recommendations and incorporate within them some specific consideration of the "purpose and use" of the vessels. In the case of Hawaii, we are confident that this consideration has not been given. In view of this we advise that instead of the actions proposed by the advisory committee that the following actions be considered:

1. Retire the ATLANTIS II
2. Outfit both the KNORR and MELVILLE for support of the ALVIN
3. Substitute the MOANA WAVE for the KANA KEOKI
4. Retire the KANA KEOKI
5. Maintain seven class "C" vessels in the fleet
6. Retire the VELERO IV as soon as is reasonable
7. Replace the VELERO IV with a class "C" or "D" ship

This would reduce the fleet by three ships as would the Advisory Council plan, would not require the construction of a new ship in 1986, and would leave added capability in the Central and Western Pacific where it is needed.

HIG Cruise Tracks 1966 - 1981



unh
UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE 03824

UNH Marine Program
Marine Program Building
(603) 862-2994

October 8, 1982

Captain William D. Barbee
UNOLS Executive Secretary
UNOLS Office WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Dear Bill:

Attached is the response of the New England Cooperative Coastal Research Facility (NECCRF) Association to the second draft copy of the UNOLS Advisory Council's report concerning recommendations on the future composition, disposition and management of the academic fleet -- this response being solicited by Derek Spencer's letter of 1 October 1982. The Association, whose members include eighteen New England universities and laboratories with research interests in this region's coastal waters, is pleased to have this opportunity. Its comments are based on experiences gained during its ten years of existence during which time it very actively participated in activities leading to the eventual construction of the two new coastal research vessels as well as in other marine research related matters. Scientists from several of the Association's institutions have also conducted research aboard the R/V CAPE HATTERAS during its first year of operation.

The attached comments are both general and specific in nature. The first comment is, in effect, a statement largely reenforcing the Advisory Council's views on the current situation regarding federal support for marine science and, additionally, proposing certain action steps. Specific comments follow which focus on certain of the Council's recommendations of particular interest to the Association's members.

With best regards and good wishes for a successful UNOLS fall meeting.

Sincerely,

E. Eugene Allmendinger
Chairman, NECCRF Association

EEA:djc

Enclosure

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October 8, 1982

Captain William D. Barbee
UNOLS Executive Secretary
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With best regards and good wishes for a successful UNOLS fall meeting.

Sincerely,

E. Eugene Allmendinger
Chairman, NECCRF Association

EEA:djc

Enclosure

NECCRF ASSOCIATION COMMENTS

on the UNOLS A/C Report

on

RECOMMENDATIONS CONCERNING COMPOSITION, DISPOSITION, AND MANAGEMENT

OF THE ACADEMIC FLEET

1. THE SEVEN LEAN YEARS -- prepared for the Association by Robert M. Kidd of the Bigelow Laboratory.

During the 1970s, fifty-two nations, including the United States, participated in the International Decade of Ocean Exploration (IDOE), and thereby achieved significant advances in ocean science research through the shared work of a number of multi-national teams.

Yet, today our national funding of research in oceanography would require an additional $65 million in 1983, merely to match the level of our annual investment in the early years of that decade -- a "recovery" which would fail to make up the growth potential which was irretrievably lost in the intervening period.

The plain fact is that, for the past seven consecutive years, research monies from the National Science Foundation (NSF) Division of Ocean Sciences have steadily declined. At the time of this writing, there are 20% fewer scientists funded in this field than there were in 1975. And it is noteworthy that five of these lean years fell within the span of IDOE.

Clearly, the major problem our ocean science researchers face today is an insufficient -- and still dwindling -- national investment in basic science.

This problem is not confined to oceanographic research. Actually, it is a symptomatic corollary of a slackening pace in the support of all branches of science. For confirmation, we have only to look at a few of the relevant indicators: support for scientific equipment, support for graduate and post-doctoral training, support for science teaching in secondary schools and colleges.

In this age of rapidly expanding technology, when to stand still is to lose ground, we as a nation are forfeiting our leadership position by reducing our scientific commitment at a time when other countries are allocating a larger percentage of Gross National Product to the support of science. To take just one European example, France has announced a schedule of continuing increase year by year, with specific attention to the needs of oceanography.

In May of 1982, NSF and the Office of Naval Research (ONR) directed the Advisory Council of the University National Laboratory System (UNOLS), which operates research vessels owned by NSF, to:

> Develop specific recommendations on a ship-by-ship basis for the composition, distribution and management of the UNOLS fleet in the 1983-1988 time frame.

The directive left no doubt that the goal was a lower total expenditure, and the Advisory Council has responded by presenting a comprehensive document which addresses replacement, lay-ups, reassignments and retirements from the academic fleet.

What is wrong here, by the Advisory Council's own observation, is that they have been charged to deal with a symptom of the basic issue of under-investment in research support: "(The Council) deplores its assigned task to recommend reductions of a fleet that is already inadequate to support the excellent ocean science proposed around the nation." Its statement noted that shiptime support at one major oceanographic institution has declined from a figure representing 52% of its total expenditure in 1971 to the equivalent of 17% in 1981.

Concerned scientists and civic leaders must not accept a plan recommending reductions in the capability of the academic fleet. Adoption would accept the underlying premise that this nation is willing to abdicate its resolve to maintain its preeminence in the ocean sciences. It is our responsibility as citizens in a democratic society to heighten the awareness of the Administration and the Congress of the essential benefits which would follow from increased federal investment in science.

2. Class "D" Vessels and the ISELIN -- The Association concurs with recommendations concerning Class "D"vessels. In this regard, however, the redeployment of the ISELIN is viewed with apprehension -- this move being foreseen as causing a schedule overloading of the two Class "D" CAPE vessels. The overloading of these vessels is of particular concern to the Association as it is considered potentially threatening to the cooperative use of the CAPE HATTERAS for research in New England's coastal waters.

3. Class "E" and "F" Vessels -- While the Association's interests are not particularly affected by the recommendation relegating "E" and "F" Class vessels to a "project-by-project" funding status, such action is to be viewed as evidence of further erosion of national support for marine research. In recognizing that the CAPE HENLOPEN has been effectively used for New England coastal research, the Association assumes that this vessel will be appropriately funded in this new status.

4. Small Research Vessels -- The Association welcomes recognition of the small research vessels as being an integral and important component of the overall ship-facilities for conducting marine research. It strongly endorses the recommendation that NSF/OFS current funding be retained for these small vessels and concurs that eligibility for funding be based on compliance with UNOLS Research Vessel Safety Standards. Further, the Association believes that cognizance of these small vessels should remain with NSF/OFS.

5. Proposed UNOLS Scheduling Committee -- The Association agrees with the concept of the proposed UNOLS Scheduling Committee with the following proviso -- if vessels from classes below "A" and "B" are included in long-range voyage scheduling, appropriate representation from institutions operating these vessels should be on this Committee.

6. New Construction Funds -- If new construction funds become available, the Association feels that these funds should not necessarily be assigned to the replacement of the VELERO IV but should be allocated where the need is most acute.

THE UNIVERSITY OF TEXAS AT AUSTIN
MARINE SCIENCE INSTITUTE
P. O. Box 7999, University Station
AUSTIN, TEXAS 78712

200 E. 26½ St.
(512) 471-4816

15 October 1982

Capt. W. D. Barbee
UNOLS Office WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

Dear Capt. Barbee:

I applaud the comments and observations made by Bill Gaither in his letter to you, dated Oct. 12, 1982. His suggestions are timely, realistic and reflect the views of many in the marine community. I'm sure that, in regard to some of the vessels in the UNOLS fleet, you have heard the story about the dinosaurs.

Sincerely,

Robby Moore

J. Robert Moore
Professor Marine Studies

JRM:lj

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SCRIPPS INSTITUTION OF OCEANOGRAPHY

GEOLOGICAL RESEARCH DIVISION
LA JOLLA, CALIFORNIA 92093

13 October 1982

Captain William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

Dear Captain Barbee:

I am writing in response to the UNOLS Advisory council draft report of 27 August 1982, and offer some thoughts on some issues addressed there.

I. On ship size and equipment: Since the majority of ships and ship operators have and use smaller ships I suspect that there is a tendency to underestimate the capabilities provided by the larger "full-service" ships as compared to "bare boat" operations. Marine geophysics and geology operations and some other fields have in common many data acquisition problems, specifically those related to navigation and general underway observations. When facilities for these are not provided by the ship operator, they must be furnished set up, debugged and operated by the scientist - users on a leg by leg basis. This results in an increase in cost to the user and causes the irretrievable loss of the scientist and technician time used in repeated setting up and tearing down of the same types of equipment not to mention the resulting use of primitive real-time displays of data and navigation which hinder ones judgement.

II. On the size of marine operations: joint operation of several ships offers advantages not available to one-ship operations the marine professions and trades are fields of intense competition for the services of capable individuals. The aggregate knowledge and experience available to a multi-ship operator will, given the same average level of competence, be greater than will be available to the small operator. This does not necessarily mean that the small operations will be less effective but certainly that more effort, expense or managerial talent will be required.

III. Ship classification. The ambiguous and arbitrary nature of the division between "A" and "B" ships seems not to add anything to the discussion.

LeRoy M. Dorman
Professor of Geophysics

cc. Dr. D. Spencer
Dr. G. Shor

LMD/slm

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GEOLOGICAL RESEARCH DIVISION
LA JOLLA, CALIFORNIA 92093

13 October 1982

Captain William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

Dear Capt. Barbee:

I am writing to express my consternation at the recommendation in the draft final report of the Advisory Council Report of the UNOLS Fleet Workshop to withdraw the R/V Melville from service in the academic fleet. I am a seismologist who works with ocean-bottom seismometers (OBSs) and am currently involved in DARPA's Marine Seismic System (MSS) program. I have used the Melville in the past (two legs in 1977) and have two legs (65 days) scheduled on her in January - March, 1983.

The upcoming DARPA program illustrates well the capabilities that the Melville has which are not shared by any other research vessel on the West Coast, including the other so-called "Class A" ship, the R/V Thompson. These operations require the recovery and redeployment of a bottom-processing package (BPP) weighing 11,000 lb to which is attached a 60,000' mooring and nearly 30,000' of torsion-balanced coaxial cable (which connects the BPP to a sophisticated seismometer installed in a DSDP drill hole). A special Pengo winch, 22' long, 8' wide and 9' high, is required to bring in the mooring and considerable fantail space is required for line handling. This ship must also be able to maintain station over the drill hole. A special study by Global Marine Development Inc. concluded that these operations were not feasible on AGOR-12 vessels. On the other hand, we shall have no problems accomodating this work on the Melville and, furthermore, will be able to conduct OBS recovery operations on the same leg.

The MSS installation in the South Pacific is designed to be reservicable, as will other MSS installations in the Northwest Pacific. Furthermore, we hope to develop a wire-line reentry technique which will allow the MSS to be deployed in open DSDP holes without the use of the D/V Glomar Challenger. The Melville is the only research ship based on the West Coast capable of accomplishing such operations; not only do we require her deck space and carrying capacity, but we also need her

excellent station-keeping capabilities. We therefore consider her continued support essential to the success of this program.

I have another, more general concern. We are standing at the beginning of a new era in marine seismology when ocean-bottom seismometers of new design (longer period, broader bandwidth, tri-axial) will be used to record earthquakes and explosions at considerable distances and for considerable lengths of time to study oceanic upper mantle structure. It is difficult to get the long deployment times necessary (several weeks or more) without the use of a ship that can support more than one large operation during the same leg. For example, in 1977 we deployed an OBS array off Acapulco, steamed to 21°N to do Deep-Tow work, and returned to recover the OBSs. This could not have been done on, say, the R/V Thompson or R/V Washington. To accomplish these same experiments using a lesser ship would have taken considerably more ship time, for which we probably would not have been funded.

Given the importance of this particular vessel to our projected research program, I therefore urge the Advisory Council to reconsider its recommendation.

Sincerely,

Thomas H. Jordan

Thomas H. Jordan
Professor of Geophysics

cc. Dr. D. Spencer
Dr. G. Shor

THJ/slm

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La Jolla, CA 92093

October 12, 1982

Captain William Barbee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

Dear Captain Barbee:

I am writing concerning the UNOLS Advisory Council "Report of the UNOLS Fleet Workshop."

As a physical oceanographer who has occasional need of large ships from which to deploy and recover moored and drifting instruments, I am quite concerned over the recommendation that the Melville be withdrawn from service. This recommdnation seems to be based on the notions that all "Class A" ships are comparable and that no operating institution should lose its only ship.

I cannot speak to the "save the only ship" approach--it is egalitarian and it may also be inefficient. But I can, and must, state that the notion of equivalence between the Washington/Thompson class and the Knorr or Melville is inaccurate. For moorings or large drifting buoys, the larger vessels are more capable by a factor of two or more. Without the use of one of these ships, programs which we will be carrying out over the next few years will require twice the ship time projected. This will not only significantly increase project costs (in ship operating and at-sea technician time), it will greatly reduce the ship time available for others.

I cannot speak to who should run the Melville, but to remove it from the Pacific coast will very much work to the detriment of my own plans, and those of many other west coast oceanographers. Times are tough and we may have more ship time than we can afford. But it would very much reduce our ship capability, as well as quantity, to retire the only large UNOLS ship on the west coast.

I sincerely hope that you will seek better informed information about how our ships are used before a drastic and regrettable decision is made. It

is nice for each institution to have a ship to run but not if this means giving up the ships we need to get some jobs done while retaining ships with lesser capability. The present recommendation definitely has aspects of King Solomon's approach to child custody - divide it equally even if everyone suffers.

Sincerely yours,

Russ E. Davis
Chairman
Ocean Research Division

RED:cb

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GEOLOGICAL RESEARCH DIVISION
LA JOLLA, CALIFORNIA 92093

13 October 1982

MEMORANDUM

Members, UNOLS Advisory Council

Gentlemen:

I am writing in support of the retention of the R/V Melville in the U.S. academic research fleet. I currently anticipate the award of a contract by the Defense Advanced Research Projects Agency (DARPA), which includes sixty days of R/V Melville time, to support the deployment, testing, recovery and redeployment of the Marine Seismic System (MSS) in a borehole to be drilled, simultaneously, by the D/V Glomar Challenger. I shall twice deploy an array of ocean bottom seismographs (OBS) around the drill hole and MSS and, after a 45 day recording period, recover the OBS's and the five ton MSS bottom recording package with its elaborate mooring system. The only ships in the academic fleet with sufficient load and A-frame capacity as well as deck space to recover this package are the R/V's Knorr and Melville. In addition, adequate space exists to support the OBS operation (2 large vans) and store 17 tons of class A and class B explosives.

The MSS program, if successful, will likely continue and, possibly, grow. We are currently exploring the development of a wire-line reentry system for R/V Melville which would permit independent reentry and exploitation of DSDP holes. The Melville is, of course, ideally suited to the task given its cycloid propulsion and positioning system. The enormous reduction in costs, vis-a-vis the Challenger or Explorer, of hole reentry could well make the expanded deployment of long - term borehole instrumentation practical. Again, only R/V's Knorr and Melville are suited for this task.

Finally, I'd like to point out the enormous and fundamental successes achieved during the RISE expedition to 21°N on the East Pacific Rise. R/V Melville supported Lulu/Alvin during this expedition, including

acting as "Hotel" ship, while facilitating large on-board science programs such as Deep-Tow and ANGUS and an OBS program.

The R/V Melville is an enormously valuable ship for academic research and, with R/V Knorr, is unique in its capability of supporting the high-technology, interdisciplinary and multidisciplinary experiments so typical of modern oceanography. We ask that you consider these important and unique attributes and their clear role in the oceanographic research of the present and future before making a decision regarding the future disposition of the academic fleet.

Sincerely,

John A. Orcutt
Associate Professor of Geophysics

cc. Dr. D. Spencer
Dr. G. Shor

JAO/slm

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11 October 1982

Dr. Derek Spencer
Chairman, UNOLS
WHOI
Woods Hole, Mass. 02543

Dear Derek:

We write in real concern about the underlying philosophy revealed in the draft report and recommendations of the UNOLS Advisory Council. While many will have written you about individual ships, this letter is intended to draw attention to a major problem that affects all oceanographers equally.

In the UNOLS Advisory Council report, the following facts are stated clearly in the first two chapters. We have no reason to disagree with these statements.

1. Financial support for oceanography has decreased greatly over the past five years. Funds are therefore inadequate to support all of the present ships.

2. The number of challenging and useful problems, and of competent investigators, has increased greatly over that same time period.

3. These new problems are primarily ones that use the large and intermediate ships (classes 1, 2, 3, or classes A, B, C); therefore demand for these ships is likely to increase.

4. "The six vessels in Classes A and B (1&2) are unique national assets, essential to the health and vitality of U.S. oceanography. The permanent retirement, without replacement, of any of these vessels will have deep and harmful effects on the national capability to conduct global research in the oceans and to carry out large-scale multi-investigator research in U.S. waters or adjacent regions."

No such statement as (4) was made about any other class of ships.

5. Use of Class A&B (1&2 in NAS report), which had dropped earlier, has increased significantly from 1981 to 1982, and is predicted to increase in 1983 to 4.7 ship years; it is suggested that 1983 may be anomalously low, and that use may increase even more in 1984. Projecting the 1981-83 use to 1984 suggests a demand for 5.6 ship-years; conversion of Atlantis II for Alvin-tending will reduce available time to 5.3-5.5.

6. Use of the present 7 Class C (class 3) intermediate ships, which has been close to capacity for some time, is expected to drop in 1982 and 1983 to about 6 ship years.

7. Use of the Class 4 ships (UNOLS 4 Class D ships, plus one Class E) has historically been only at 69% of capacity, and is expected to drop to 38% in 1983.

8. Use of the Class 5 (UNOLS E and F, less one) ships has historically been at only 77% of capacity, and is expected to drop to 62% in 1983. All of these statistics are taken from Table 2b, checked against the original NAS report.

From this, the Council reached the following conclusions, in their recommendations:

A. Class 5 ships should have their funding mechanism changed, but should continue to be funded at present levels (approximately 60% of full operations), and all should be retained.

University of Miami
Miami, Florida 33149

OFFICE OF THE DEAN
Dorothy H. and Lewis Rosenstiel
School of Marine and Atmospheric Science
4600 Rickenbacker Causeway (305) 350-7519

Ref.: 100-313:AB:jl 11 October 1982

UNOLS OFFICE WB-15
c/o Captain William Barbee
School of Oceanography
University of Washington
Seattle, Wa. 98195

Attention: Bruce H. Robison, Chairman,
UNOLS Advisory Council

Dear Sir:

Re.: Draft Final Report of Advisory Council's Recommendations for Composition Distribution and Management of Academic Fleet for 1983-88 dated 27 August 1982.

The Rosenstiel School of Marine and Atmospheric Science (RSMAS) of the University of Miami has reviewed the subject draft and takes strong objection to the conclusions and recommendations of the draft. Insofar as the recommendations and conclusions affect RSMAS operated vessels, we do not believe that they are supported by information available to us.

RSMAS recommends in strongest possible terms that both the ORV Cape Florida and the ORV Columbus Iselin be retained in service under RSMAS operation.

Table 1 represents our current understanding of the schedule of these vessels for calendar year 1984.

While significant perturbations of this usage pattern might occur because of funding shortfalls that might develop because of a failure to renew proposals, even under current worst case projections, 1984 usage of the Columbus Iselin already appears to be approximately a minimum of 220 days. Such projected usage, fifteen months before the beginning of calendar year 1984, shows a remarkably robust user interest in this vessel by RSMAS scientists and by their colleagues. Removal of this vessel would present RSMAS and the east coast community with a serious deficiency in adequate Class C oceanographic vessels.

RSMAS is particularly disturbed by the proposal contained in the draft report to remove the Iselin to Hawaii.

Each UNOLS operating institution has evolved its particular ship resources to fit its major ship users. At RSMAS our ships were designed for:

1) Physical oceanographic array deployments of as many as 15 deep sea mooring with anchor weights of 5000 lbs. as in the GATE or POLYMODE, numerous Florida Straits experiments such as STACS (through 1987), South Atlantic Bight, Blake Plateau Experiments (Lee, et al through 1984).

2) Geological Sampling with long cores and heavy dredging.

3) Deep net tows requiring a stern ramp and large deck area.

4) Winter work in the Straits of Florida and east of Cape Hatteras.

The ORV Columbus Iselin was designed by RSMAS to meet specific ongoing needs for large deck area, major winch capability and reasonable sea keeping ability at a reasonable price. While ORV Cape Florida meets many other needs for coastal work, lighter gear handling, smaller or less numerous moorings, it does not replace COLUMBUS ISELIN (or GILLIS) for the above purposes.

The Columbus Iselin has effectively served as a regional facility for research in the Gulf Stream, western Atlantic and the Carribean for the past 10 years. The RSMAS ship operation home is ideally located for staging investigations into these areas thus reducing the costs of dead-heading. Past activities and future plans show a strong interest in research requiring mooring deployments in the southeast. The Columbus Iselin was specifically designed for this type of work and the nearest vessel with her mooring capabilities is 4 days steaming time from Miami. As an example, if the Columbus Iselin were to be removed from the area, a ship from the northeast area would be required to travel a total of about 8 days dead-heading on a round-trip whenever it was desired to accomplish mooring activities in the Florida Straits or Caribbean.

With the early retirement of GILLIS, (when Cape Florida became available), RSMAS has already made a major sacrifice in its deep sea capability. The tentatively proposed removal of COLUMBUS ISELIN poses an unacceptably large further reduction in the ability of RSMAS to serve its own scientists and those of their colleagues at other east coast institutions. With the further removal of RV Atlantis II from general Atlantic service and other

large ships committed to the Pacific, we suggest that UNOLS reexamine it's priorities and retain both Cape Florida and Columbus Iselin in service with MIAMI as a base.

When GILLIS was removed from the academic fleet, RSMAS never envisioned loss of COLUMBUS ISELIN. The institution has always viewed COLUMBUS ISELIN as a permanent, pivotal facility upon which the majority of seagoing programs depend.

In view of the planned programs for COLUMBUS ISELIN in 1984 and beyond, coupled with the loss of GILLISS at the end of 1979, RSMAS considers that the loss of COLUMBUS ISELIN would adversely impact its institutional viability for the next decade. The proposed transfer of COLUMBUS ISELIN is viewed as being devastating to presently planned programs and to the long-term growth potential of RSMAS.

Alan Berman

Ref.: 100-313:AB:jl 11 October 1982

TABLE 1

Current projections for ship day usage of the ORV COLUMBUS ISELIN:

	1984
Funded Program at RSMAS	122
Renewal Program at RSMAS	14
New Program	44
Average External Usage	96
	276

DEPARTMENT OF EARTH AND PLANETARY SCIENCES
54-814
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

October 12, 1982

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

Dear Captain Barbee:

I just recently received the UNOLS Advisory Council Report on the UNOLS Fleet workshop, 18-20th August 1982. Since I have a number of comments, I will attempt to discuss them in some degree of order.

The first problem with this document is that it strictly addresses the consequences of a reduced or tight budget and does not discuss the causes. I think we should all ask why the budget is inadequate. I think we would agree that the present peer-review system fairly and effectively eliminates most "bad" science from being funded. A great deal of the recent large ship blue-water oceanographic research has produced stunning results. One need only mention the ridge crest vent work with its implications for heavy-metals exploration, geochemistry, water chemistry, convective deep water circulation and implications for the origins of life to convince any lay person, voter or congressman that big-ship oceanography is important, exciting and should be funded. So why has the share of the pie for large ships been declining so over the last ten years? The decisions must be being made within NSF and ONR. Granted a voter whose parent, spouse or child has just died of cancer may find bio-medicine a more worthy recipient of his tax dollars; oceanography does not sell big on the 6 o'clock news, while cancer and toxic shock syndrome do. We of the oceanographic community have failed our public relations needs. We should ask ourselves what an effective PR campaign might cost and is it too late. We should not sacrifice our academic oceanographic fleet to bail out an OMD program that should be funded by the oil industry and not by academic institutions.

The second point I have argued with Bob Wall many times. Again it is a cause versus consequence question. NSF claims there is not a need for six large ships. I claim that if six large ships were available and adequately funded they would be fully utilized. Good scientists are not going to waste their time writing good proposals to use ships that they know will not be funded. As stated in the UNOLS document, NSF Ocean Sciences supports 20% fewer scientists in 1980 than 1975.

Cont/-

Numerous good scientists have left academic research because spouses and children find it hard to live on unfunded NSF proposals. If the large ships are cut from six to five this year, I envision a cut from five to four in three years until eventually only two ships will be left; one in the Pacific and one in the Atlantic both of which will spend most of their time in foreign ports "showing the flag" for State department reasons.

Research scientists may be willing to wait a year or two to get a ship to a particular area of interest remote from the U.S. but few, if any, will wait five years. With fewer big ships how often do you envision U.S. academic oceanographic ships working in Indonesian waters, the Bay of Bengal, the Indian, South Atlantic or far South Pacific oceans? Not often enough to keep on-going research projects supplied with data or dedicated scientists enthused enough to keep submitting well-thoughtout proposals that may be funded but put off for years awaiting an available ship (i.e. Steve Cande's Chile Rise work that waited three years). As the wait grows longer for U.S. ships, more of us will find that our urgent area of interest has been well-surveyed by English, French, German, Japanese or Russian ships and consequently no longer urgent.

My third point concerns my own research. I do heat flow and marine magnetics research. Neither work requires a whole ship even of a class D size but my interests lie remote from the U.S. (Andaman Sea, Banda Sea, Scotia Sea, Bouvet Triple Junction and other such places). Consequently my research fits nicely as ancillary programs on other scientists' cruises. Large ships are the only ones that have the flexibility and size to accommodate important ancillary programs without overcrowding quarters, lab space and desk space. I hope UNOLS will consider the impact on ancillary programs such as mine before they eliminate class A ships. Having just returned from a cruise on R/V S.P. Lee, which is clearly a dedicated class B ship, it was difficult although not impossible to carry out my heat flow program on such a ship. An additional ancillary program would have found no lab space, no bunk space as well as the exceedingly cramped deck space that I encountered.

The fourth point I would like to make specifically concerns R/V Melville. Every time I have worked on Melville the ship has performed well without any problems. The twin cycloids and their excellent manueverability provide superior station keeping ability. Melville is spacious and roomy which is perhaps why we were psychologically able to survive a 42-day cruise aboard her. If Melville had a NAVSTAR system it would become one of the best platforms for performing deep-water oceanography that required any degree of precise positioning for both long experiments - launch and recovery of bouys and moorings and short term station work such as piston coring and heat flow work that suffers severely from ship drift on pullout.

Cont/-

In conclusion I can only surmise that Melville was suggested for retirement because a UNOLS committee, each member of which has a vested interest in protecting their own ships, looked at the list of ships and noted that Scripps operated more ships than anyone else. I think it would be infinitely better if an impartial committee of ship users could make the final decision.

Sincerely yours,

Lawrence D Lawver

Lawrence Lawver

LAL/jlp

c.c. George Shor, Scripps Institute of Oceanography
Derek Spencer, Woods Hole Oceanographic Institute

UNIVERSITY OF DELAWARE
NEWARK, DELAWARE
19711

COLLEGE OF MARINE STUDIES
OFFICE OF THE DEAN
ROBINSON HALL
PHONE: 302-738-2841

October 12, 1982

Captain William D. Barbee
UNOLS Executive Secretary
UNOLS Office WB-15
School of Oceanography
University of Washington
Seattle, WA 98195

Subject: UNOLS Advisory Council Report
on August 18-20, 1982 Workshop

Dear Bill:

This is written in response to Derek Spencer's invitation to comment on the Advisory Council's second draft report titled "Report of the UNOLS Fleet Workshop August 18-20, 1982."

I have read this revised report transmitted to members with Bruce Robison's letter of August 27, 1982. First, let me say that it is a much improved report, clearly reflecting Council consideration of member inputs at the Boulder workshop. There are several observations that we at the University of Delaware want to make.

1. We want to commend the Advisory Council for recommending that the cost of all vessels should be stated clearly in all [research] proposals. (Refs: page 15; Recommendation 5, p. 34; and p. 41). This is an absolutely essential step to encourage investigators using a single ship, or sharing a ship, to select the most cost-effective platform. If this recommendation is implemented there may, over the next two or so years, be a natural movement away from the Class A and B ships to Class C and D ships.

2. We take issue with the Advisory Council's analysis of Class D ships and specifically the statement that there is "a close match to demand from funded, scientific projects" (top of page 27). We contend that on the east coast there are now four Class D ships in operation and competing for academic science (i.e., CAPE FLORIDA, CAPE HATTERAS, CAPE HENLOPEN, and EASTWARD--see attached advertisement from September 1982 Sea Technology). We have no opinion about the west coast situation where VELERO IV and ALPHA HELIX operate.

3. We object most strongly to the "down classing" of the CAPE HENLOPEN from Class D to Class E. The statements made on page 29 indicate a serious lack of appreciation by the Advisory Council of (1) what coastal ships were designed to do and (2) the differences in operating characteristics of the CAPE HENLOPEN and the WARFIELD. The criterion

which should be applied in assigning a vessel to a particular class is its ability to perform satisfactorily at sea in comparison with other ships of the same class. Remember, the purpose of coastal ships, as defined by the April 12, 1972 report of the UNOLS Working Group on Coastal Zone Research Vessels used to justify to Congress the construction of the "Cape Class" was that they "be specifically adapted for coastal applications" where "Projects tend to be short in duration and tend to have very short lead times." Coastal ships should not be judged as small, blue water, oceanographic ships. The CAPE HENLOPEN is fitted with 12 scientific berths and can accommodate 14 scientists if necessary. Endurance has not been a limitation. Users are uniformly satisfied that the ship performs at sea as well or better than larger vessels. See attached user comments. Only twice in six and one half years of operation has green water crossed her working deck.

The WARFIELD is a ship of entirely different design and thus has different performance characteristics when working offshore in adverse weather. For the Advisory Council to use the same rationale for placing the CAPE HENLOPEN in Class E as used for the WARFIELD (page 29) is to demonstrate beyond all reasonable doubt their individual and collective lack of appreciation of either ship.

4. We believe that all UNOLS ships should be available in a free-market system with each investigator required to demonstrate, with his or her proposal, that the platform(s) requested provide the most cost-effective method of conducting their proposed research. If such a system is put into operation, at least four benefits should accrue to the oceanographic community within one or two years. These are:

   (a) A natural selection of which ships are needed in the nation's oceanographic fleet.

   (b) An understandable rationale for ship retention or lay-up that could be used to defend budget requests.

   (c) Competition by ship operators to provide the best possible service to ship users.

   (d) Elimination of the lingering suspicion that ocean science research project support decisions are made, in part, to fill the schedules of block-funded ships and thus justify their continued operation.

It is quite conceivable that with the free-market system in operation, Class A and B ships would be in less demand and Classes C, D, E and F would be in greater demand.

5. The rationale for retiring VELERO IV sounds reasonable (page 27). The solution recommended; i.e. "replacement of VELERO IV with a new ship in about 1986." may be reasonable if full consideration is given to relocating CAPE HATTERAS to southern California at the end of the present five year operating contract with Duke. This action would relieve the oversupply of coastal ships on the east coast noted in point 2 above.

We hope that these comments will be useful and will be incorporated in the final recommendations of the Advisory Council.

Sincerely yours,

W. S. Gaither, Dean

/mko
cc: UNOLS Members
G. Gross & R. LaCount, NSF
K. Kallum, ONR
R. Schneider
W. Owen
CMS Oceanography Faculty

USER COMMENTS ON R.V. CAPE HENLOPEN PERFORMANCE

The "Cape" or "Coastal Zone Research Vessel" (CZRV) class is designed to perform oceanographic work in the shelf, shelf/slope break, and portions of the slope. Long range and endurance are not as necessary as they are for deep sea oceanographic ships. What is necessary is for the "Cape" class ships to perform routine and special oceanographic functions in the coastal area. The R/V CAPE HENLOPEN has proven ability to perform these functions. Biological, chemical, marine geology/geophysics, and physical oceanographic cruises have been performed by the CAPE HENLOPEN. Trawling, plankton tows, CTD and rosette casts, box coring, current meter emplacement and mooring recovery, bottom photography, and sub-bottom profiling have all been performed successfully by the CAPE HENLOPEN.

The following comments are indicative of the CAPE HENLOPEN's success as a full fledged "Cape" class vessel:

MARINE BIOLOGY

"The CAPE HENLOPEN is a good ship for its size and the crew, although few in number, were just plain great!...travel time between stations was minimal due to ship's speed."

Dr. L. S. Murphy, Bigelow Laboratory for Ocean Sciences

PHYSICAL OCEANOGRAPHY, including current meter mooring recovery:

"Ship and crew performed admirably. Working with the University of Delaware continues to be a pleasure. CTD survey with Delaware technicians went flawlessly."

Kenneth Hunkins, Lamont-Doherty Geol. Obs.

"I wish to thank you and your people for what was for us a very successful and enjoyable cruise during April aboard the R/V CAPE HENLOPEN. Captain John Gay and his crew were both pleasant and professional in carrying out their duties and in helping us with our tasks. It was the unsolicited opinion of several of the science crew (including myself) that the cruise was one of the most pleasant in many years."

Wilford Gardner, Chief Scientist
Lamont-Doherty Geol. Obs.

"We feel that the high percentage of mooring recovery...would not have been possible without the considerable assistance of the HENLOPEN crew."

Michael Rawson, Project Manager, Lamont-Doherty Geol. Obs.

"The CAPE HENLOPEN is the most efficient and cost effective vessel of the platforms we have used for the Canyon and Slope studies during 1981-82. The ships' crew are extremely helpful at all times and are a major factor in being able to conduct our oceanographic work 24 hrs./day. The HENLOPEN is very versatile for its size; we have conducted 3 separate sampling procedures during each leg. We have now used the HENLOPEN for 5 cruises during the Baltimore Canyon and slope studies and have not been adversely affected by the size of the vessel--even with a full complement of 10 scientists (plus 2 technicians from University of Delaware).

The CTD van and rosette sampler has functioned very well in all weather conditions. The data acquired using the optional CTD equipment has more than repaid the per-day cost of this equipment.

From a total of 5 cruises we have lost very little time due to weather. The HENLOPEN is able to work in sea conditions on an equal basis with just about any class C&D vessel in the UNOLS fleet--and probably some of the Class B as well. Contrary to prior thoughts, it was not necessary to return to Lewes during heavy weather conditions; the few times it was too rough to work, we waited out the weather on station.

Shore support facilities and personnel should be rated as excellent."

Michael Rawson, Program Manager
Lamont-Doherty Geol. Obs.

GEOLOGY - Box coring

"The best cruise I have ever been on in 18 years. Felt the safest during box core operations at sea of any time in my life."

E. A. Kennedy (formerly of Texas A&M University)
Tereco

MEASUREMENT OF DIRECTION WAVE SPECTRA IN FULL GALE CONDITIONS:

"We are convinced that our measurements of ocean waves have been very successful. The success is largely due to your excellent arrangement, very kind assistance of the staff of your college, and excellent support of the CAPE HENLOPEN's crew."

Hisashi, Mitsuyasu, Research Institute for Applied Mechanics,
Kyushu University

"The cooperation of Captain John Gay, III and the crew was greatly appreciated for it enabled us to be 90% operational at the time of the storm which insured us of a highly unique data set. The professional attitude of this crew is a credit to your university."

Thorndike Saville, Jr., Technical Director
Coastal Engineering Research Center

CTD Transects:

"After preliminary analysis of the data acquired during our summer of oceanographic sampling in the South Atlantic Bight, it is clear that we have an excellent data set, thanks in a large part to the outstanding crew on board the CAPE HENLOPEN. Their willingness to operate the ship at a pace such that we could acquire nearly synoptic data over a large part of the Bight was especially critical to our success. What other ship is approaching 10 knots before CTD is on deck!"

Larry P. Atkinson, Associate Professor
Skidaway Institute of Oceanography

GEOPHYSICAL SURVEY - Winter Conditions on Georges Bank and in Mid Atlantic:

"May I express our complete satisfaction in the vessel, for the good service of the crew and for the cordial and efficient relationship with Mr. Owen."

Joseph DeLerno, Vice President
Offshore Navigation, Inc.

"I feel confident that a major factor in the success of the operation can be attributed to the helpfulness and professionalism of the Captain and crew of the CAPE HENLOPEN. The efficient control of variables such as on-line steering and vessel speed control, helped produce high-quality side scan sonar data."

Wayne J. Cox, Associate Marine Geologist
Intersea Research Corporation

The above comments show that the R/V CAPE HENLOPEN is not only performing as a full "Cape" class ship but is doing it <u>well</u>.

October 12, 1982

JOINT PROGRAM
IN
OCEANOGRAPHY
AND
OCEANOGRAPHIC ENGINEERING

EDUCATION OFFICE
Dean of Graduate Studies
Dr. Charles D. Hollister

OFFICE OF THE PROVOST
M.I.T. Director
Prof. John G. Sclater

8 October 1982

Dr. Ronald R. Lacount
Oceanographic Facilities Support
Section
National Science Foundation
1800 G Street N.W.
Washington, DC 20550

Dear Dr. Lacount,

This letter is a direct outcome of the letter by George Shor to William Barbee at the UNOLS office, and concerns the outcome of the UNOLS Advisory Council draft report which recommends the lay up of the Melville.

As a past personal user of the Melville, and as a person with a group that is involved in one to two months of sea time in the deep oceans each year, I am concerned for a number of reasons by the decisions that may be made on the basis of the UNOLS Advisory Council report.

First, though I appreciate the difficulty of the community having to self police hard and unpleasant cuts in budget, I do not think the ultimate decision should be left to UNOLS alone. Operators of ships have too large a personal interest in the survival of their own operation to cut rationally or even in the national interest on a subject so close to their own hearts and interests. "You do not put twelve alley cats in a box with the stipulation that only ten can get out without expecting a God Almighty fight and a total mess." If Triage operations have to be applied to our ships, then the final decision should be made by a group representing the whole community and not just the operators of the ships. Personally, I thought this was one of the items with which the Ocean Sciences Board of the National Academy was set up to deal.

Second, about ten years ago, a student of mine, Dallas Abbot, and I did a survey of the literature in oceanography to estimate how many publications resulted from work done on certain ships over a five year period. The major conclusion from this report was that the larger the ship, the more publications that resulted. Though this may be a somewhat crude method of measuring scientific effectiveness and certainly needs to be redone, it demonstrated to me and Bob Dinsmore, to whom we gave our results, that cutting out one large ship to maintain two small ships was not the most effective way of promoting effective science. I believe that before such a critical step as removing a large ship like the Melville is taken, some effort to evaluate the science

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that will be lost by doing this should be made.

Third, why cut the Melville? It is the only ship in the fleet stationed in the Pacific that can do large scale Physical and Chemical Oceanographic programs. Agreed, there have been problems with the ship, but I do not see that they have been much worse than those concerning either the Conrad or the Atlantis II in recent years.

Fourth, in a period of contraction, it is essential for the visibility of our field that the large coherent elements do not get reduced below the level of effective survival. I am a deep sea scientist. For my research I need well run ships involved in global research. When all is said and done, this can only be accomplished at Institutions committed to such research. These are the major ones, of which, Scripps and Woods Hole are the premier. Cutting out the major deep sea ship of one of these Institutions is a big step with implications that are not necessarily immediately apparent. Anyway you look at it, it represents a reduction of commitment to the deep sea that is not necessarily justified by present reduced levels of funding.

I appreciate the hard and industrious effort that the UNOLS Advisory Council made to match the outlay of funds with the money we obtain to run the ships. However, it is my contention that, though they are the right group to advise, they are the wrong group to make the final decision on the problem. I feel this is a decision which should be handled by an ad hoc committee of the National Academy of Sciences and that it should have on it, in addition to representatives of the operators, a broad-based group of eminant oceanographers who are not tied to specific institutions. In addition, I feel that the scientific output from research on a particular ship or from a particular group should play a substantive role in any decision that is made.

Sincerely yours,

John G. Sclater, Director
MIT/WHOI Joint Program Office
MIT 26-167

JGS:ma

MOSS LANDING MARINE LABORATORIES

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October 21, 1982

Captain William D. Barbee
UNOLS Executive Secretary
UNOLS Office WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

Dear Bill:

Here are my comments on the UNOLS AC report on the August 18-20 workshop.

1. I agree with eliminating the MELVILLE from the UNOLS fleet. I think this unfortunate, but it is the only way to realize the substantial savings necessary to achieve a better balance between funds for science and funds for ship operations.

2. The ISELIN move does not seem to have much support, at least at Miami or Hawaii. I don't have any better ideas, other than to suggest that this issue be rethought.

3. I am especially pleased that all proposals will have ship cost esimates in them. This may provide some incentive for the use of smaller, less costly ships.

4. I really don't understand how ships ended up in the D and E categories. For example, EB SCRIPPS and CAYUSE have relatively large operating ranges (Mexico, South America, Hawaii, the Pacific northwest, etc.). Although they are both small, they serve important NSF research programs in relatively distant waters. Nevertheless, both are now in Class E. On the other hand, VELERO operates almost exclusively in the Southern California Bight. VELERO isn't that much bigger than CAYUSE and SCRIPPS, yet she is allowed to remain in Class D. Was this decision based on the fact that VELERO costs about $1,000,000 a year to operate, while CAYUSE and EB SCRIPPS cost about half this?

I am not asking that CAYUSE be upgraded to Class D. I think each member of the community has to contribute in some way to the solution of our current problem. However, in fairness to SIO and MLML, I believe that VELERO should also be assigned to Class E.

In conclusion, I think that the Advisory Council has listened to the community, has made some difficult decisions, and has come up with a plan that is fair to all.

Best regards,

John H. Martin
Director