

16. For the improvement and replacement of ship support facilities and for new concepts of shore depots \$0.5M in 1973 and \$1.0M subsequently should be planned pending a realistic assessment of needs.

17. In identifying other specialized facilities involving the use of advanced technology in academic research the assistance of the National Academy of Sciences Ocean Affairs Board in cooperation with the National Academy of Engineering Marine Board should be solicited. Tentative funding of about 5 to 10% of total ship support should be planned for.

18. Recommended funding for selected areas of facility support in the short and near terms is summarized in the following table. In many cases the arrangements shown are tenuous and in need of further study, but it does serve as an open starting point and inclusion rather than not is considered the lesser error.

SUMMARY OF RECOMMENDED FUNDING
(Millions of Dollars)

	1972				1973				1974				
	NSF	ONR	OTH	TOT	NSF	ONR	OTH	TOT	NSF	ONR	EPA	OTH	TOT
Research Ships	10.7	4.3	1.5	16.5	11.4	4.7	0.25	18.1	12.4	4.7	0.25	19.1	1.5
Operations	1.2	-	-	1.2	1.2	0.1	-	1.3	1.5	0.4	-	1.9	0.2
Equipment	0.5	-	-	0.5	0.5	-	-	0.6	0.7	-	-	0.7	0.2
Marine technicians	2.8	-	-	2.8	2.8	-	-	2.8	8.0	-	-	8.0	0.9
Replacement & Construction	15.2	4.3	1.5	21.0	15.9	6.8	0.25	22.8	22.6	5.1	0.25	29.9	1.5
(Total)	(15.2)	(4.3)	(1.5)	(21.0)	(15.9)	(6.8)	(0.25)	(22.8)	(22.6)	(5.1)	(0.25)	(29.9)	(1.5)
Shore Facility	0.9	-	-	0.9	0.5	-	-	0.5	1.0	-	-	1.0	-
Specialized Facility Support	0.2	0.5	-	0.7	0.4	0.5	-	1.3	0.6	0.5	-	1.7	0.2
Submeribles	0.1	-	-	0.1	0.1	-	-	0.1	0.1	-	-	0.1	0.1
BT Facilities	0.1	-	-	0.1	0.1	-	-	0.1	0.1	-	-	0.1	0.1
Aircraft	0.1	-	-	0.1	0.1	-	-	0.1	0.2	-	-	0.2	0.2
Other Spec. Facil & Oper.	0.1	1.0	-	1.1	0.5	0.9	0.3	1.7	1.0	1.0	0.3	2.3	0.2
(Total)	(0.5)	(1.5)	-	(2.0)	(1.1)	(1.4)	(0.7)	(3.2)	(1.9)	(1.5)	(0.9)	(4.3)	(1.5)
TOTAL	16.6	5.8	1.5	23.9	17.5	6.2	1.05	26.5	25.5	6.6	1.35	35.2	1.5

	1975	1976	1977	1978
Research Ships	21.1	22.6	24.1	25.6
Operations	2.1	2.2	2.4	2.5
Equipment	2.1	2.2	2.4	2.5
Marine Technicians	0.9	1.0	1.0	1.0
Replacement & Construction	8.0	8.0	8.0	8.0
(Total)	(32.1)	(33.8)	(35.5)	(37.1)
Shore Facility	1.0	1.0	1.0	1.0
Specialized Facility Support	1.9	1.9	2.0	2.0
Submeribles	-	-	-	-
B/T Facilities	-	-	-	-
Aircraft	0.5	0.5	0.7	0.8
Other Spec. Facil & Oper.	2.5	3.0	3.0	3.0
(Total)	(4.9)	(5.5)	(5.7)	(5.8)
TOTAL	38.0	40.3	42.2	43.9

Federal Support for Other Operations and Facilities

11. In 1974, NSF skip construction funds should be applied to the replacement of one large academic research vessel; and, with funds remaining, to the construction of at least one coastal research vessel according to the foregoing priorities.

Through UNOLS there have been identified and will continue to be identified specialized facilities which contribute to the effectiveness of academic marine research. These are usually on a case by case basis. To date only a few selected areas have received any close scrutiny. The failure of UNOLS to include other facilities does not imply non-support so much as the analysis of the need for such specialized facilities has not yet been completed.

12. It is recommended that the UNOLS concept of National Oceanographic Facilities be implemented (a) to broaden the cooperative use of facilities, and more important (b) to develop new applications of advanced technology for use by scientists.

13. Submersibles should be utilized more in university research than at present, both on an institutional basis and as National Oceanographic Facilities (including charter funding). Total support of about \$1.3M in 1973 and \$1.9M in 1974 should be about evenly divided between ONR, NSF, and NOAA (MUS&T Office). The two latter agencies should join in supporting at least two submersibles and a submersible "charter fund" as UNOLS National Oceanographic Facilities.

14. The bathythermograph facilities at Scripps Institution and Woods Hole should be supported through 1974 at a total level of about \$100,000 after which time those activities should be consolidated into the general data system of the respective institution.

15. The role of aircraft for university research has not been fully defined by UNOLS. Pending this, it is recommended that in 1973 support of the Scripps Institution aircraft be continued as an interim National Oceanographic Facility for one-half of its available flight time at a funding level of about \$60,000.

Federal Support for Small Vessels and Boats

Whereas almost the entire academic research fleet of ships over 100-ft. in size receives direct Federal Support, only a small fraction of the smaller coastal vessels are so funded. In general, those which are Federally funded have proved to be capable, effective and well operated ships; and those which are not, are little or ineffectively used. The need for capable coastal research vessels has been identified as a priority item by UNOLS. Presently six boats in the 65-ft. range are funded in the amount of about \$0.5M.

8. In order to provide for capable small coastal research vessels, the number of craft now receiving direct support should be about doubled, and \$0.5M of new funds supplied to meet this need. These funds, commencing in 1973, should come equally from NOAA and EPA who have clear responsibilities for funding research in the coastal zone.

Ship Construction and Replacement

New construction of academic research vessels has been funded to the extent of \$2.8M in 1972 and 1973 by NSF. Navy which has built and owns eleven ships of the fleet has no present plans for academic ship replacement. At present, the replacement cycle for the UNOLS fleet is about sixty years. The coastal zone area has been identified as bearing the greatest need for new and replacement vessels. This need further extends to institutions which can gain access to ship use on a cooperative basis.

9. Both NSF and Navy should continue plans for academic research ship replacement based on a 15-20 year amortization. This will require coordinated funding of about \$8M per year commencing in 1974.

10. Based on the coastal zone having been identified as the area most in need of additional ship facilities, NSF ship construction funds for 1973 should be allocated to construct at least two vessels according to the following priorities:

1. Replacement of existing cooperative coastal research vessels.
2. Replacement of institutional coastal research vessels.
3. New construction of cooperative coastal research vessels.
4. New construction of institutional coastal research vessels.

("Cooperative" is defined as a vessel operated by an institution or consortia on behalf of the needs of all academic institutions in a given region.)

Federal Support for Ship Operations

Funding projected by Federal Agencies (ONR and NSF) for 1973 operations of the existing UNOLS academic research fleet appears to be adequate at about \$17.6M. It is estimated that costs will rise about 8% per year in the period 1974-1977. Apart from operating costs, shipboard equipment and marine technicians are critical areas which are not now adequately funded.

4. The projected figure of \$17.6M should be continued as the operating funds in 1973 for the existing UNOLS academic research fleet. During the period 1974-1977 funding should be increased about 8% (about \$1.5M) annually.
5. The renewal and upgrading of shipboard equipment are key factors in effective ship operations. Lack of funds for equipment now constitutes one of the greatest deficiencies in ship support. In 1973 at least \$1.3M should be allocated specifically for ships equipment; thereafter an amount equivalent to about 10% of the total support for ship operations should be reserved for equipment.
6. The development of higher performance ship operations together with the use of shared equipment both within institutions and on an interinstitutional cooperative basis has accentuated the need for trained marine technicians funded separately. This concept should be established at major laboratories and separately funded. Pending further experience about \$0.9M per year should be allotted for this purpose.
7. Direct funding of research ship operations by ONR and NSF has resulted in a highly effective utilization of academic research ships as well as a means for cooperative use of ships by outside scientists. Present levels of support by NSF and ONR should be continued and, in addition, agencies such as NOAA, the Atomic Energy Commission, Environmental Protection Agency and others whose research programs are supported by the existence of these ships should consider participating in the "block funding" arrangement of university research vessels.

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM
(UNOLS)

ADVISORY COUNCIL REPORT
July, 1972

SUMMARY AND RECOMMENDATIONS

The University-National Oceanographic Laboratory System (UNOLS) provides for an annual report by its Advisory Council on the utilization and support of research vessels. This is the first of such reports which are intended for the use of Federal Agencies having responsibilities for funding oceanographic research and facility usage at academic institutions. This summary consolidates the conclusions and recommendations which are presented in the text of the report.

Ship Scheduling and Access

UNOLS ship schedule coordination meetings were held in November 1971 and May, 1972. Scientists from non-ship-operating institutions did not participate to the extent anticipated. In order to increase participation in this program the following recommendations are offered.

1. In 1973 two ship schedule coordinating sessions should be held; one each on the east and west coasts. They should be as accessible as possible to working scientists. Wherever possible, other regional and consortia meetings should undertake to coordinate ship requirements and to keep UNOLS informed of their activities.

2. Broad and timely distribution of UNOLS tentative ship operating schedules should be made well in advance of scheduled meetings. Schedules should contain detailed scientific program information and cruise tracks.

3. There should be the closest possible coordination between the UNOLS Office and Federal ship operating activities for the purpose of information exchange and effective utilization of ship time.