

Report of Meeting
of
UNOLS REVIEW COMMITTEE
for
DSRV ALVIN
17-18 June 1976
Woods Hole, Mass.

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Submitted

Approved

R. P. Dinsmore
Executive Secretary, UNOLS
August 20, 1976

Adrian F. Richards
Chairman

DRAFT COPY

UNOLS REVIEW COMMITTEE
for
DSRV ALVIN
Summary of Recommendations
17-18 June 1976

1. The non-scientific use of ALVIN is usually more significant each year than planned for. It further contributes substantial funding support. Such use should, in the future, be included in the recommended schedule but care should be exercised that it compliments but does not supplant science work. The Navy should officially recognize the role of ALVIN as a national resource important to the Navy mission.
2. The formula for determining daily rate costs to users not participating in the joint funding arrangement for ALVIN should be changed to make those costs more realistic and equitable.
3. The future of ALVIN beyond the current ONR-NSF-NOAA funding agreement (1975-1977) will be the subject of a separate report. This report will reflect the following findings and recommendations:
 - . ALVIN is a vital tool for ocean science programs. It should be continued as a National Oceanographic Facility.
 - . It can be better utilized for science through longer range planning by groups of scientists working together identifying important problem areas and their solutions.
 - . Funding support for ALVIN should continue on a planned basis and in some way should reflect the role of ALVIN as a national resource as well as bear a direct relationship to the science it will undertake.
4. For Calendar Year 1977 - the Committee recommends the accomplishment of 23 projects totalling 178 use days. Specific assignments are contained in the Report.
5. Noting that the required support for the recommended 1977 program amounts to an estimated \$1,410,000, the additional required support over the current \$900,000 ONR-NSF-NOAA joint funding agreement should be apportioned as follows:

<u>Agency</u>	<u>Additional Funds</u>	<u>Total</u>
ONR	None	\$ 300,000
NSF	\$352,000	652,000
NOAA	None	300,000
Other	158,000	158,000
<hr/>		
Total	\$510,000	\$1,410,000

Report of Meeting
UNOLS REVIEW COMMITTEE
For
DSRV ALVIN

17-18 June 1976 — Woods Hole Oceanographic Institution

1. The third annual meeting of the DSRV ALVIN Review Committee convened on 17 June at the Woods Hole Oceanographic Institution.

Present were:

Dr. Adrian F. Richards, Lehigh Univ., Chairman
Dr. Robert Corell, UNH, Member
Dr. George Grice, W.H.O.I., Member
Dr. George Keller, O.S.U., Member
Dr. Arthur E. Maxwell, W.H.O.I., Member
Dr. Claes Rooth, Univ. Miami, Member
Dr. Karl K. Turekian, Yale, Member

Mrs. Sandra Toye, NSF, Observer
Dr. Bruce T. Malfait, NSF, Observer
Dr. Robert E. Wall, NSF, Observer
CDR. Van K. Nield, ONR, Observer
CDR. John Harlett, ONR, Observer
Dr. Alexander Malahoff, ONR, Observer
Dr. Bernard Zahuranec, ONR, Observer
Dr. Donald C. Beaumarriage, NOAA, Observer

Dr. Richard C. Dugdale, Bigelow Lab., UNOLS A/C Chairman
Capt. Robertson P. Dinsmore, UNOLS Executive Secretary
Mr. Larry Shumaker, W.H.O.I., ALVIN Manager
Mr. William M. Marquet, W.H.O.I., ALVIN Group
Dr. Robert A. Frosch, W.H.O.I.
Dr. Earl E. Hays, W.H.O.I.

In addition, the following scientists participated in the first days discussion of ALVIN operations and use:

Dr. Robert D. Ballard, W.H.O.I.
Dr. Bruce C. Heezen, L.D.G.O.
Dr. J. Frederick Grassle, W.H.O.I.
Dr. Holger W. Jannasch, W.H.O.I.
Dr. Roland Wigley, NOAA

2. Dr. Richards, Chairman, convened the meeting. He noted that the recent Annual UNOLS Meeting had appointed the following new members to serve for three years:

Dr. Robert Corell, UNH
Dr. Michael Gregg, Univ. Washington
Dr. Dennis Hayes, L.D.G.O.

He further noted that Drs. Hessler and Van Andel were unable to attend and that the terms of Drs. Murphy, Drake and Rooth are expiring. Membership status is summarized as follows:

- . To expire July, 1976
 Drake, Murphy, Rooth
- . To expire July, 1977
 Hessler, Keller, Van Andel
- . To expire July, 1978
 Richards, Turekian, Grice
- . To expire July, 1979
 Corell, Gregg, Hayes

3. The tentative agenda was introduced and approved. This is attached as Appendix A.

4. The role of ALVIN in selected science programs was discussed by the following scientists in terms of their accomplishments in the use of ALVIN:

- . Dr. Robert D. Ballard discussed the 1976 Cayman Trough work. He stressed the combined ship-sub efforts and the unique documented sampling which the submersible provides.

- . Dr. J. Frederick Grassle described the biology work at the Deep Ocean Stations in the recruitment, growth and mortality of deep-sea benthic populations.

- . Dr. Holger W. Jannasch discussed the work on the rates of biological and organic geochemical processes in the deep ocean. He stressed the importance of planned serial biological experiments at fixed deep ocean stations & noted the uniqueness of deep submersibles for this work.

. Dr. Roland Wigley described some fisheries use but submitted that most fishery problems are on the shelf within range of shallow subs such as PICES and NEKTON. He noted, however, that the forthcoming 200 mile limit may push fisheries work into deeper water.

. Dr. Bruce C. Heezen showed much of the results of his diving in the Puerto Rican Trench. He stressed the importance of visual observations and the need to do surface sampling before diving. Dr. Heezen further compared ALVIN operations to Navy (SEA CLIFF & TURTLE). Principal advantage of ALVIN is dedication to science and more favorable launch threshold.

. Mr. Larry Shumaker, ALVIN Operations Manager discussed the role of ALVIN in non-scientific missions -- chiefly Navy. These are largely short term, occasionally emergency operations which experience has shown to indicate a continuing requirement for ALVIN as the only deep submersible in the Atlantic Area. He noted that requests for Navy operations usually occur during the year on an opportunity and have been an important element in total ALVIN support. Mrs. Toye asked if the Navy has a formal recognition of this operational role. No known stated Navy requirement is known to exist.

There followed a lengthy discussion on the non-scientific role of ALVIN with general agreement that this ought to be recognized and provided for. Dr. Turekian submitted that non-scientific use should not interfere with the primary role of ALVIN as a scientific facility.

5. Mr. Shumaker reported on the 1976 operations of ALVIN. He presented data through 1 June which represented the Southern portion of the years operation. This included 126 operating days of which 73 were use days during which 49 dives were accomplished. Projecting through

the end of the operational year -- 1 September 1976 -- and additional 54 operating and use days* are anticipated with an estimated 37 dives. The 1976 operating schedule, cruise summary, dive summary, and operating statistics presented by Mr. Shumaker are attached as Appendix B.

6. Comparing actual 1976 Operations to that recommended by the Committee at its October 10, 1976 Meeting shows the following analysis:

	Research Sponsor	Use Days Recommended	Actual Use Days <u>1/</u>	Actual Dives <u>1/</u>
Biology Group: (JANNASCH, TURNER, GRASSLE, HAEDRICH, et. al.)	NSF & ONR	40	23	15
ROWE & COHEN	NOAA	10	10	8
ROWE	ONR	10	0	<u>2/</u>
COHEN & STAIGER	NOAA & NSF	10	0	<u>2/</u>
HEEZEN	ONR	18	18	5
EDWARDS	NOAA	10	0	<u>2/</u>
COOPER	NOAA	10	10	8
BALLARD	NSF	28	30	15
GINSBURG	NSF	10	0	<u>2/</u>
NEUMANN	NSF	8	0	<u>2/</u>
KELLER	NOAA	7	0	<u>2/</u>
CORLISS	NSF	3	3	3
ROELS - <u>3/</u>	NOAA	1	1	1
NAVFAC	Navy	<u>4/</u>	8	7
NAVELEX	Navy	<u>4/</u>	12	10
NUSC	Navy	<u>4/</u>	2	2
DYER	E.P.A.	<u>4/</u>	10	6
(Certification)	-	-	-	6
(Total)		165	127	86

Notes: 1/ Based on actual data through July 1, 1976 and projected through remainder of year.

2/ Eliminated from recommended schedule due to shortfall in actual funding for science operations.

3/ Standing recommendation from Committee recommendations of 2/19/75.

4/ Operations contracted for during year to support full year's schedule.

"Use Days" are defined as days underway ready for diving plus transit time specifically assigned to a particular project. Experience has shown that the average number of dives is about two-thirds of the use-days.

"Operating Days" are days away from Woods Hole except major overhauls.

The estimated profile of 1976 use by agency sponsoring research is:

	USE DAYS		DIVES
	Recommended	Actual	
NSF	84	48	27
NAVY *	38	48	30
NOAA	43	21	17
EPA	-	10	6
total	165	127	80

(* The 38 recommended Navy use days were all ONR. Actual Navy use was 26 for ONR and 22 for Naval systems activities)

A projected profile of discipline use for 1976 shows:

	No. Dives	% Dives	Use Days	Use % Days
Tests and Certification	6	7%	-	-
Geology	23	27%	51	40%
Biology	31	36%	43	34%
Ocean Engineering	20	23%	23	18%
Mixed Environmental	6	7%	10	8%
Total	86		127	

7. Mr. Shumaker distributed copies of a draft report - DSRV ALVIN: A Review of Accomplishments - which was prepared by his office. This report gives the history of ALVIN, a narrative of scientific and Navy dives and a compilation of all publications and reports of ALVIN work. Comments of the Committee and reviewers are requested. When completed the report will be distributed separately.
8. Dr. R. A. Frosch reviewed the 1975 funding support arrangements for ALVIN and the various impacts on ALVIN scheduling and operations.

Starting with a full schedule of 164 use days recommended by the Committee at its Oct. 10, 1975 Meeting and estimated to cost \$1,370,000 (including a \$140,000 1974 deficit) cuts were made on Jan. 26, 1975 to an 80 use day schedule when foreseeable funding was limited to \$1,010,000 for support of scientific missions. The schedule reductions were made in consultation with Federal Agency Representatives and using priorities set by the Committee at its October 1975 Meeting.

As the year progressed, additional missions were added or proposed so that by mid-June the anticipated funding was \$1,317,029 to provide for the current schedule of 127 use days. A summary of Dr. Frosch's discussion is contained in Appendix C.

9. A profile of 1976 ALVIN support and use data shows the following:

	SUPPORT	USE DAYS	DAILY RATE
NSF	\$ 474,000	} 95	\$ 11,358
ONR	300,000		
NOAA	305,000		
EPA	78,000	10	7,437
Navy Systems	160,000	22	
	\$ 1,317,000	127	\$ 10,370

The seemingly unequal rates between the NSF-ONR-NOAA "joint funding" use and the "extramural" support occurs because the latter is computed on an ONR formula using the previous 12 months costs whereas the former comes from a negotiated figure. Costs are actually based upon "operating days" which for 1976 is projected at 180. On this basis, (and excluding the \$140,400 prior year deficit), the actual operational 1976 daily rate cost is \$6,537. Because extra missions are opportunistic in nature, use days and operating days for those operations are very nearly the same, whereas the regularly scheduled and planned use must account for transits and maintenance which are not reflected in "use days".

It was the opinion of the Committee, however, that a more equitable scheme be devised for apportioning costs of missions outside of the joint funding arrangements.

10. Dr. Frosch next described the new ALVIN/LULU escort policy which is intended to increase the overall safety of transit and diving operations but utilize a failsafe communications - quick reaction support arrangement as an alternative to an on scene escort which has occasionally proven to be of dubious value. Under this arrangement a positive communications plan with the U.S. Coast Guard will bring support within 3 hours when operating within 200 miles of U.S. coasts. Backup on-scene radars

and underwater telephones are included as part of the new policy. A draft copy of the new escort policy was circulated and is included as Appendix D to this report.

11. The Federal Agency observers present were invited to express their views and comments.

Mrs. Toye (NSF) noted that the science schedule cutback in the 1976 schedule was done in direct consultation with the Federal observers to the program and in accordance with the Committee priorities. She stated that all interested parties were represented and any dissatisfaction with the 1976 schedule has little basis. She advised that NSF is adding an additional \$74,000 support to cover an additional biological science cruise for which the Committee had expressed an urgency.

Dr. Wall (NSF) pointed out the various interfaces (i.e. Facilities, IDOE, oceanography) within the National Science Foundation and suggested that the Committee as well as ONR and NSF recognize these varying roles.

Commander Nield (ONR) expressed optimism that ALVIN is an increasingly more effective tool for science. He hoped to see more development in handling systems and integration with other systems (deep tow, ships, etc.)

Dr. Zahuranec (ONR) noted a limited interest by ONR biology in submersibles but that for those few projects where underwater work "rounds out" surface studies it is more effective and less costly to use submersibles than develop automatic systems.

Dr. Malahoff (ONR) opined that almost all Navy programs interact with the sea floor and that a submarine geology has a continuing relation with Navy missions. Elements such as sediment dynamics, bottom boundary layer, bottom structure all pose a role for the "ALVIN-Scientist team". He suggests longer range planning including meetings with ONR program managers for getting scientists involved with ALVIN interested in the ONR Mission.

Dr. Beaumarriage stressed the greater interest by NOAA in shallow water biology where less expensive submersibles than ALVIN could be utilized. He described the deep missions proposed for this year will require the one-third interest by NOAA in the joint funding arrangement.

12. The Chairman introduced the request by the UNOLS Advisory Council that the Committee develop a position regarding the support of ALVIN as a National Oceanographic Facility beyond the current ONR-NSF-NOAA funding agreement which terminates in 1977. Specifically, discussions are needed which address the following:

- (1) An assessment of the recent role of ALVIN for doing good science.
- (2) Is there a continued need for this capability? As a National Oceanographic Facility?
- (3) Has the current support arrangement been satisfactory? Why?
- (4) How can the support arrangement be improved?
- (5) What procedures can and should be instituted to assure the most effective use of ALVIN?

As an initiated step for this, a working group (Ballard, Grassle, Richards, Dinsmore) prepared a draft report which was circulated to the meeting participants. Members were requested to review this draft during the evening and to submit comments at the beginning of the second day's session.

13. A detailed discussion was undertaken on the development of future programs for ALVIN in the 1977 time frame and beyond. Dr. Ballard reported on the two workshops recently held as examples of planning efforts for the development of submersible programs. These were:

- . East Pacific Rise workshop, April 26-27, 1976 at Scripps Institution. This was for the purpose of developing a broad geological investigations of the East Pacific Rise.
- . ALVIN Planning Workshop, May 24, 1976 at Woods Hole Oceanographic Institution. This was for the purpose of bringing together biologists to discuss areas of future interest and effort utilizing ALVIN.

Reports of these workshops are being prepared and will be distributed separately. It was agreed that significant programs for ALVIN use are

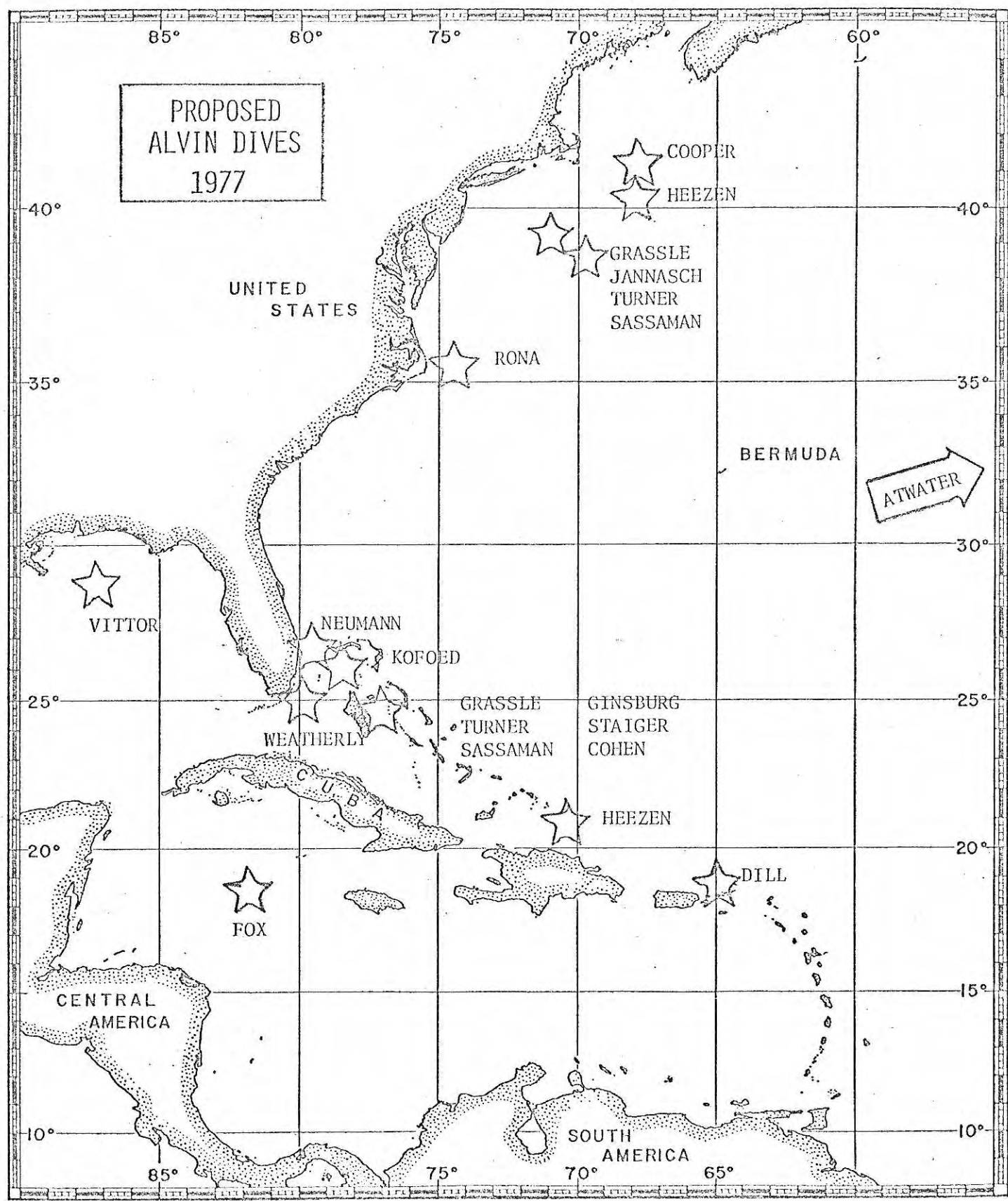
best developed over a multi-year frame utilizing workshops such as these.

14. As a result of their reviews of the draft ALVIN report (Section 10 above), Committee members reported their comments and recommended revisions. Based on the comments Dr. Maxwell proposed that the Committee's Report be structured somewhat differently from the original UNOLS Advisory List although addressing the same essentials. It was agreed that the Report would comprise the following:

- I. Scientific Uses of ALVIN
 - a. Past Results
 - b. Future Plans
- II. Administrative Arrangements
 - a. UNOLS ALVIN Review Committee
 - b. Scientific Workshops
 - c. Communications with Scientific Community
- III. Funding Arrangement
 - a. Present 3 year period
 - b. Future recommendations
- IV. Technical Improvements
 - a. Submersibles
 - b. Support Ship
- V. Summary of Recommendations

Based on the comments received it was agreed that Drs. Maxwell and Rooth with the assistance of Dr. Ballard and the Executive Secretary would compile another draft for circulation to the Committee.

15. The meeting then turned to the business of reviewing the proposed use for ALVIN in 1977. The Executive Secretary summarized the proposals received. A summary table is given by Appendix E and shown on Figures 1 and 2. He noted that a total of 24 requests are pending representing 210 dives on or about 333 use days.



HONJO

CORLISS
LONSDALE

Figure 1

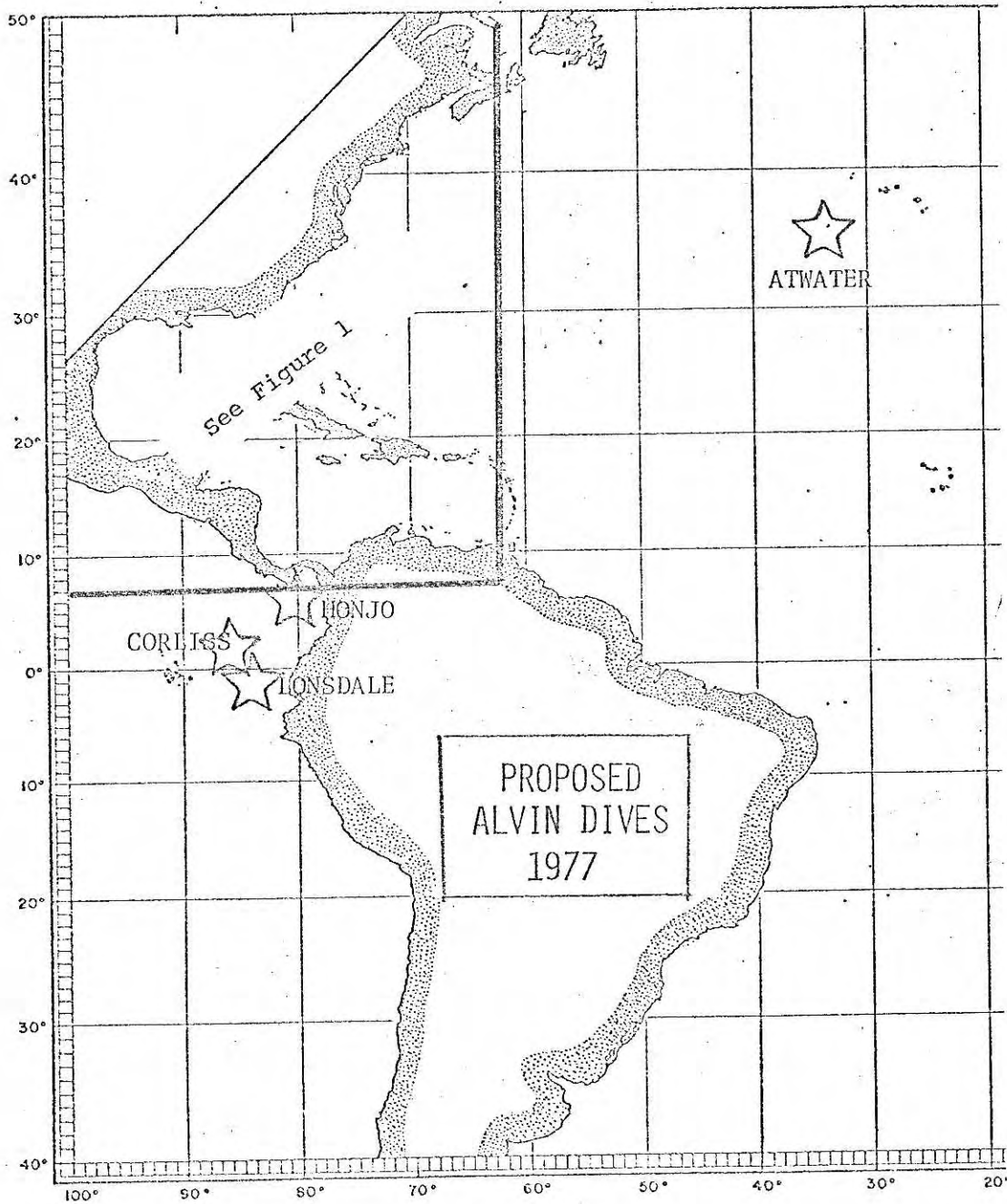


Figure 2

A profile of proposed use for 1977 is as follows: (showing comparisons with 1975 and 1976)

	1975	1976	1977
<u>General</u>			
Total number of proposals.....	25	30	24
Number of dives requested.....	115	160	210
Number of use days requested.....	171 days	246 days	333 days
Number of principal investigators....	25	31	21
Number of academic labs.....	10	14	18
Number of Federal labs.....	4	4	3
Number of Other labs.....	1	1	0
<u>By Area</u>			
Northern area (north of Delaware)			
Proposals.....	12	14	7
Use Days	83 days	91 days	85 days
Mid-Atlantic Area (Del. to Georgia)			
Proposals.....	4	3	1
Use Days	17 days	27 days	10 days
Southern Area (Florida, Bahamas & Carib.)			
Proposals.....	12	13	15
Use Days.....	72 days	114 days	152 days
Other (Pacific & Mid-Atlantic)			
Proposals	—	—	4
Use Days	—	—	76 days
By Agency Funding Research (or proposed to fund)			
ONR.....	43	50	66
NOAA.....	36	49	70
NSF.....	77	113	187
Other.....	10	17	0
Unspecified.....	5	17	10
<hr/>			
Total	171 days	246 days	333 days
<u>By Discipline</u>			
Biology.....	118	115	150
Geology.....	39	94	165
Physical.....	11	23	12
Engineering.....	13	14	6
<hr/>			
Total	171 days	246 days	333 days
<u>Comparison with Woods Hole</u>			
W.H.O.I.....	59	89	43
Other.....	112	157	270
<hr/>			
Total	171 days	246 days	333 days

Of the 333 proposed use days, 60 have been specified by NOAA as its share of the Interagency Agreement.

16. Mr. Shumaker advised that a full operating year might comprise about 180 use days depending on extent of transits and time of starting. He noted that additional dives, normally reckoned at about 2/3 of use days could be undertaken by better use of "transit" use where batteries can be recharged during transit steaming. He further suggested that transit south and certification could be accomplished during December 1976 which would allow the user year to start promptly after New Years. Additional funding would have to be provided for the calendar if this is to be accomplished.
17. The Committee discussed whether its recommendations should address a full operating year or part of a year which would be supported by the joint funding agreement. It was agreed that a full year should be the consideration.
18. In reviewing the 24 proposals for ALVIN use the Committee continued its previous basis of
- (a) Scientific merit
 - (b) Demonstrated need for submersible time
 - (c) Feasibility for ALVIN operations
- Submitted material was carefully examined and those not meeting (b) and (c) above were excluded. The remaining were rank ordered. At this point those requests not providing sufficient information for sound scientific judgements were accorded minimum ranking.

Of the twenty-four proposals reviewed, two did not demonstrate a justifiable need for submersible time, and one did not prove feasible by reason of location or time constraints.

Of the remaining 21 proposals, all merited scientific consideration to some extent. Two of these the Galapagos Rift and the mid-Atlantic Ridge programs were major geology and geophysics projects of which only one was considered feasible for 1977 in view of other constraints. In view of previous approval of the Galapagos Rift program at the October 1975 meeting, it was recommended that the mid-Atlantic Ridge project be resubmitted for a future year.

19. Of the proposals recommended for accomplishment, the Committee applied its review judgements subject to constraints noted, and bore in mind the interests of the funding agencies. The Committee, therefore, recommended the following awards for ALVIN use in 1977:

Recommendations for 1977

<u>Proposal</u>	<u>Dives Requested</u>	<u>Use Days Requested</u>	<u>Use Days Recommended</u>
Biology Group (GRASSLE, TURNER, SASSAMAN)			
Tongue of the Ocean	14	20	10
Northern Deep Stas.	20	30	20
COHEN	8	12	5 <i>Note 1</i>
COOPER	9	13	10
CORLISS	15	40	40
FOX	8	12	10
GINSBURG	8	12	10
HEEZEN (South)	7	10	9
HEEZEN (North)	12	18	10
JANNASCH	8	12	10
KOFOED	5	7	5 <i>Note 2</i>
NEUMANN	12	18	5 <i>Note 2</i>
RONA	8	12	5
STAIGER	12	18	5 <i>Note 1</i>
WEATHERLY	9	13	4
HONJO	3	4	<i>Note 3</i>
LONSDALE	8	12	<i>Note 4</i>
Unassigned			
North	—	—	10
South	—	—	10
	166	263	178

Note 1 - Cohen & Staiger combined into one 10 day cruise

Note 2 - Kofoed & Neumann combined into one 10 day cruise

Note 3 - Attempt to include Honjo's work in transit for Galapagos Rift Project or move to Atlantic on opportunity basis.

Note 4 - Attempt to include Lonsdale in Galapagos Rift use period. No additional time or escort appears available. Otherwise defer to future year.

20. The profile of the 1976 recommended use arrangement by user benefits is:

Use by Agency

ONR	32 use days	18%
NSF	101 " "	57%
NOAA	25 " "	14%
OTHER	20 " "	11%
	<hr/> 178 " "	

Mr. Shumaker estimated that the cost of an operating year based on the recommendations shown would be \$1,410,000, but that such a figure should be used for preliminary purposes only. Based upon this, a preliminary profile of apportioned costs between user is:

ONR	-	\$ 254,000
NSF	-	800,000
NOAA	-	198,000
OTHER	-	158,000
		<hr/> \$ 1,410,000

Assuming that the ONR-NSF-NOAA joint funding agreement of \$300,000 for each agency, the excess costs over \$900,000 should be apportioned to show a final tentative recommended support by agency as follows:

<u>Agency</u>	<u>Tentative Recommended Support</u>
ONR	\$ 300,000
NSF	652,000
NOAA	300,000
OTHER	158,000
	<hr/> Total \$ 1,410,000

The "other" support shown is based upon 20 use days or a tentative daily use rate of \$7,900. Mr. Shumaker indicated that the Navy might be interested in the Southern unassigned time and that EPA had expressed an interest in continuing its 1976 work in the Northern dump sites.

21. Using the recommended use assignments and in cooperation with the Woods Hole Deep Submergence Group a tentative 1977 Operating Schedule was developed. This schedule is given in Appendix F.
22. The Committee summarized its recommendations for the future operations of ALVIN as follows, noting that this will comprise the major elements of the report to UNOLS and the Federal Agencies:
 - . The ALVIN should be continued as a National Oceanographic Facility.
 - . Funding support should be provided in such a way as to insure full operations by ALVIN but still attract new users and support elements.
 - . Planning for ALVIN use should not be on a year by year basis but over several years reflecting the development of first rate programs by groups of experienced scientists.
 - . The planning cycle for ALVIN use should include workshops and adequate information to attract new users and scientists into the program.
23. There being no further business, the meeting was adjourned.

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

DSRV ALVIN REVIEW COMMITTEE
Third Meeting - 17-18 June 1976
Woods Hole Oceanographic Institution

TENTATIVE AGENDA

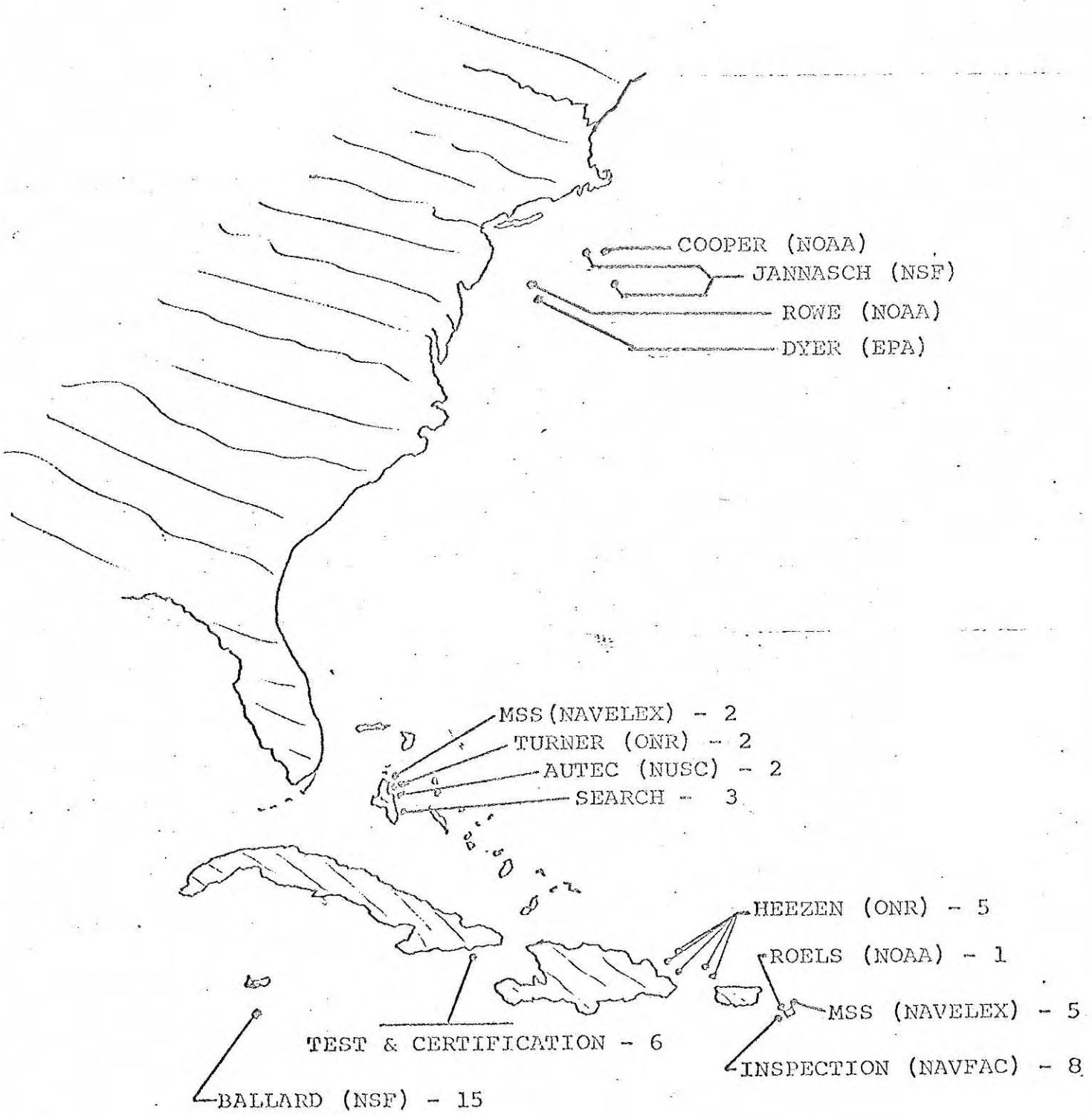
Convene 0830 - Thursday 17 June 1976
Carriage House Conference Center

1. Introduction - Dr. Adrian F. Richards, Chairman
2. Review of First Two Years of ALVIN Operations as a National Oceanographic Facility - Dr. Robert Frosch
 - . Administration - budgets
 - . Scheduling
 - . Operations
 - . Science
3. Role of ALVIN as an effective tool for science in terms of specific accomplishments and potential
 - . Dr. Robert Ballard - Cayman Trough
 - . Drs. Ruth Turner/Holger Jannasch - Benthic Biology
 - . Dr. Richard Cooper - Fishery investigations
 - . Dr. Bruce Heezen - Submarine Geological Processes
 - . Mr. Larry Shumaker - Navy requirements
4. Report on 1976 Diving Season - Larry Shumaker
5. Comments and discussion by Federal Agency representatives.
6. Summary of 1977 - Requests - R. P. Dinsmore
7. Review of 1977 requests and development of recommended schedule
8. Outlook for 1978 and beyond
 - . Development of future programs
 - Report of West Coast Meeting - Dr. Robert Ballard
 - Report of East Coast Meeting - Dr. Fred Grassle
 - . Support and Funding arrangements
 - development of UNOLS recommendations on the continuation of ALVIN as National Oceanographic Facility and the support funding incident thereto.
9. Other Business

ALVIN

USER DAYS 1976 (TO 1 JUNE) -----	73
TRANSIT	19
WEATHER	4
IN PORT OPERATIONS.....	2
DIVE DAYS	48
MAINTENANCE, STANDOWN & HOLIDAYS -----	46
DAYS LOST DUE TO LULU CASUALTY -----	9
NORTH/SOUTH TRANSIT -----	16
EAST/WEST TRANSIT -----	7
	<hr/>
TOTAL DAYS TO 1 JUNE	151

ALVIN 1976



ALVIN 1976
DIVE UTILIZATION

	<u>1975</u>	<u>1976 (to 1 June)</u>	<u>1976 (Sched.)</u>
TEST & CERTIFICATION	3	6	
ENGINEERING (ARPA)	4(p)		
NON-SCIENCE SEARCH	1	3(p)	
MSS PROGRAM (NAVY)		7(p)	
SURVEY & INSPECTION (NAVY)		10(p)	
SEARCH (UNIV. OF MIAMI)	1		
BIOLOGY	38	2	22
GEOLOGY	9	20	
RADWASTE INVESTIGATION	2		6(p)
INSPECTION (LAMONT-ROELS)		<u>1(p)</u>	<u> </u>
TOTALS	58	49	28

1976 Cruise
Summary

CRUISE #	SPONSOR	DATES	LOCATIONS	CHIEF SCI	OPS DIR	PURPOSE
83-1	Joint agreement	12-11-75 12-19-75	Transit to Miami	none	none	Transit
83-2	Joint agreement	1-2-76 1-7-76	Transit to GTMO	none	Shumaker	Transit
83-3	Joint agreement	1-14-76 1-16-76	Off of GTMO	none	Shumaker	Test, tng & cert.
83-4	Joint agreement	1-23-76 1-25-76	Transit to G'town	none	Shumaker	Transit
83-5	Joint agreement	1-27-76 2-5-76	Cayman Trench	Ballard	Shumaker	Geology
83-6	Joint agreement	2-10-76 2-11-76	Cayman Trench	Ballard	Shumaker	Geology
83-7	Joint agreement	2-12-76 2-17-76	Cayman Trench	Ballard	Shumaker	Geology
83-8	Joint agreement	2-17-76 2-22-76	Cayman Trench	Ballard	Shumaker	Geology
83-9	Joint agreement	2-22-76 2-25-76	Transit to GTMO	none	Broderson	Transit
83-10	Joint agreement	2-28-76 3-6-76	Transit to San Juan	none	Broderson	Transit
83-11	Joint agreement	3-16-76 3-16-76	Transit to St. Croix	none	Shumaker	Transit
83-12	NAVFAC	3-17-76 3-24-76	Ops from St. Croix	Ballew	Shumaker	Inspection
83-13	Joint Agreement	3-26-76 3-26-76	Transit to Ch'sted	Roels	Shumaker	Transit
83-14	NADC and TRACOR GE	3-27-76 3-31-76	Ops from Ch'sted	Von- Pervandt	Shumaker	Inspection & search
83-15	NAVFAC	4-1-76 4-1-76	Off of Fr'sted	Ballew	Donnelly	Inspection
83-16	Joint agreement	4-1-76 4-2-76	Transit to San Juan	none	Donnelly	Transit
83-17	Joint agreement	4-4-76 4-15-76	PR trench & transit	Heezen	Donnelly	Geology & transit
83-18	NADC and joint agg.	4-17-76 4-21-76	TOTO	Turner	Shumaker	Biology & search

1976 Cruise
Summary (cont.)

CRUISE #	SPONSOR	DATES	LOCATIONS	CHIEF SCI	OPS DIR	PURPOSE
83-19	Joint agreement	4-21-76 4-21-76	Transit to Andros	none	Shumaker	Transit
83-20	NUSC & NAVELEX	4-22-76 4-29-76	TOTO	Santos	Shumaker	Search & recovery
83-21	Joint agreement	4-29-76 5-6-76	Transit to WHOI	none	none	Transit
84	Joint agreement	6-7-76 6-16-76	WHOI bottom stations	Jannasch	Shumaker	Biology
85	Joint agreement	6-22-76 7-1-76	NY bight dump site 106	Edwards	Shumaker	Ecology Biology
86	Joint agreement	7-7-76 7-16-76	Veatch Canyon	Uzmann	Donnelly	Geology Biology
87	EPA	7-27-76 8-5-76	Radwaste dump NY bight	Dyer	Donnelly	Radwaste recovery
88	Joint agreement	8-10-76 8-20-76	WHOI bottom stations	Jannasch	Donnelly	Biology

SUMMARY OF ALVIN DIVES - 1976

J	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
	12-10-75	604	W.H.O.I. Dock	ONR Testing	V. Wilson J. Donnelly	None	1430	1445	0-15		
	1-13-76	605	GTMO Harbor	ONR Testing & Training	J. Donnelly D. Foster	R. Hollis	1208	1220	0-12	10 ^m	
	1-14-76	606	GTMO Harbor	ONR Testing & Training	J. Donnelly L. Shumaker	R. Hollis	1535	1606	0-31	10 ^m	Post overhaul check & test of ARPA Arm
	1-15-76	607	19-50.5N 75-12.4W	ONR Testing & Training	J. Donnelly V. Wilson	B. Walden	0825	0951	1-26	850 ^m	Test ARPA Arm & Data Logger
	1-16-76	608	19-44.2N 75-12.7W	ONR Testing & Training	L. Shumaker J. Donnelly	None	0928	1505	5-37	3660 ^m	Test & Certi- fication. VB casualty.
	1-27-76	609	19-12.4N 81-18.1W	ONR Test Dive	D. Foster J. Donnelly	R. Ballard	1103	1111	0-8	120 ^m	Aborted due to UQC failure
	1-27-76	610	19-12.4N 81-18.1W	ONR Test Dive	D. Foster J. Donnelly	R. Ballard	1121	1445	3-24	1988 ^m	Tests satis- factory
	1-28-76	611	17-54.89N 81-41.59W	NSF Geology	D. Foster	R. Ballard J. deBoer	0959	1834	8-35	3639 ^m	68 lbs Rock Samples
	1-31-76	612	17-57.4N 81-36.2W	NSF Geology	J. Donnelly	J. Fox J. deBoer	0855	1606	7-11	3067 ^m	45 lbs Rock Samples
	2-1-76	613	17-57.9N 81-36.7W	NSF Geology	D. Foster	J. Fox R. Wright	0924	1753	8-29	3652 ^m	36 lbs Rock Samples

SUMMARY OF ALVIN DIVES - 1976 (CONT.)

Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
						Dive	Surf	Sub.		
2-2-76	614	17-56.6N 81-35.5W	NSF Geology	J. Donnelly	J. deBoer W. Sullivan	0929	1726	7-57	3487 ^m	3 lbs. Rock Samples
2-3-76	615	17-59.4N 81-35.8W	NSF Geology	D. Foster	K. Emery J. Fox	1028	1809	7-41	3075 ^m	112 lbs. Rock Samples
2-4-76	616	17-58.0N 81-36.8W	NSF Geology	J. Donnelly	R. Ballard T. vanAndel	0902	1709	8-07	3662 ^m	119 lbs. Rock Samples
2-10-76	617	19-08.9N 81-13.0W	NSF Geology	L. Shumaker	R. Ballard K. Emery	1006	1836	8-30	3084 ^m	
2-11-76	618	19-05.1N 81-19.7W	NSF Geology	J. Donnelly	R. Wright J. Fox	0925	1124	1-39	1600 ^m	Aborted due to loss of V.B. pressure indication
2-12-76	619	19-05.6N 81-19.9W	NSF Geology	D. Foster	R. Wright J. Fox	0936	1815	8-39	3657 ^m	
2-14-76	620	18-22.6N 81-43.8W	NSF Geology	L. Shumaker	R. Ballard J. Corliss	1025	1751	7-26	3663 ^m	44# Rock in- cluding layer 3 and 4
2-16-76	621	18-22.8N 81-45.1W	NSF Geology	J. Donnelly	K. Emery J. Fox	0916	1734	8-18	3187 ^m	
2-18-76	622	18-22.5N 81-46.1W	NSF Geology	D. Foster	R. Ballard E. Kristoff	1112	1820	7-08	2866 ^m	

SUMMARY OF ALVIN DIVES - 1976 (CONT.)

U	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
	2-19-76	623	18-24.6N 81-47.2W	NSF Geology	L. Shumaker	K. Emery R. Wright	0929	1801	8-32	3658 ^m	82# Rock
	2-20-76	624	18-21.2N 81-44.6W	NSF Geology	J. Donnelly	R. Ballard J. Fox	0926	1840	9-14	3657 ^m	
	2-21-76	625	18-22.8N 81-48.4W	NSF Geology	D. Foster	R. Wright K. Emery	0834	1455	6-21	2228 ^m	
	3-17-76	626	17-44.8N 64-56.6W	NAVFAC Inspection	D. Foster	R. Dill W. Gardner	1316	1842	5-26	1097 ^m	
	3-18-76	627	17-45.5N 64-57.8W	NAVFAC	D. Foster	R. Dill A. Sutherland	1352	1532	1-40	1135 ^m	Aborted to take George Gibson to hospital
	3-20-76	628	17-45.3N 64-57.7W	NAVFAC Inspection	D. Foster	R. Dill R. Ballew	0934	1538	6-04	1220 ^m	Inspected one array & 1400 yards cable
	3-21-76	629	17-44.6N 64-58.7W	NAVFAC Inspection	L. Shumaker	D. Wells R. Ballew	1006	1728	7-22	1108 ^m	Inspected two arrays & 4300 yards cable
	3-22-76	630	17-42.9N 64-57.2W	NAVFAC Inspection	D. Foster	A. Sutherland J. Williams	0942	1506	5-24	980 ^m	Inspected two arrays & 4000' cable

SUMMARY OF ALVIN DIVES - 1976 (CONT.)

Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
						Dive	Surf	Sub.		
3-23-76	631	17-41.7N 64-57.1W	NAVFAC Inspection	L. Shumaker	A. Sutherland R. Kirkpatrick	0949	1318	3-29	935 ^m	Inspected one array and cable
3-24-76	632	17-43N 64-55.2W	NAVFAC Inspection	D. Foster	J. Brown J. Williams	0920	1730	8-10	1161 ^m	
3-26-76	633	17-48N 64-47.5W	NOAA Inspection	L. Shumaker	L. Von Hem- elrych K. Haines	1040	1732	6-52	766 ^m	
3-27-76	634	17-49.8N 64-42.4W	NADC Search	D. Foster	L. Von Per- vandt F. Hogg	1308	1919	6-11	2350 ^m	
3-29-76	635	17-49.8N 64-42.4W	NADC Search	L. Shumaker	L. Gagne J. Wood	1008	1825	8-17	2527 ^m	
3-29-76	636	17-50.9N 64-40.8W	NADC Search	D. Foster	F. Hogg J. Bolan	1522	2025	5-03	2000 ^m	
3-30-76	637	17-50.4N 64-44.7W	NADC Search	L. Shumaker	J. Kennedy W. Mellis	1124	1843	7-19	2772 ^m	
3-31-76	638	17-52.9N 64-41.1W	TRACOR/GE Search	D. Foster	R. Mosey R. Pich	1004	1822	8-18	3610 ^m	Insp. deep moor surface to bottom
4-1-76	639	17-45.9N 64-59W	NAVFAC Inspection	D. Foster	J. Williams D. Magnuson	0735	1104	3-29	980 ^m	Insp. array & 3000' cable

SUMMARY OF ALVIN DIVES - 1976 (CONT.)

U	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
	4-5-76	640	18-38.2N 67-24.3W	Geology	D. Foster	B. Heezen M. Rawson	0923	1715	7-52	3662 ^m	Hill climb 2732 ^m 3.2 mi. horizontal
	4-6-76	641	19-13.5N 67-40.9W	Geology	J. Donnelly	B. Heezen W. Nesteroff	1007	1800	7-53	3660 ^m	
	4-7-76	642	19-14N 68-38W	Geology	D. Foster	B. Heezen R. Lynde	0928	1722	7-54	3666 ^m	
	4-8-76	643	19-44.9N 68-43.1W	Geology	D. Foster	B. Heezen M. Rawson	0944	1759	10-14	3644 ^m	
	4-10-76	644	19-31.9N 69-10.2W	Geology	D. Foster	B. Heezen W. Nesteroff	0846	1646	8-00	3542 ^m	
	4-17-76	645	24-53.2N 77-40.2W	ONR Biology	L. Shumaker	R. Turner L. Cole	1106	1824	7-18	2071 ^m	
	4-18-76	646	24-53.2N 77-40.2W	ONR Training	D. Foster	R. Turner R. Hollis	0943	1818	8-35	2163 ^m	
APPENDIX B	4-19-76	647	25-13.7N 77-45W	ONR Training	L. Shumaker	J. McCarthy	1449	1919	4-30	2830 ^m	
	4-20-76	648	25-18.2N 77-45W	NADC Salvage	D. Foster	F. Bliss J. Brown	1326	2214	8-48	2806 ^m	Recovery
	4-22-76	649	23-41.3N 77-36.6W	NUSC Inspection	L. Shumaker	J. Santos R. Ricci	0924	1558	6-34	1836 ^m	Inspection

SUMMARY OF ALVIN DIVES - 1976 (CONT.)

Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
						Dive	Surf	Sub.		
4-23-76	650	23-41.1N 77-36.8W	NUSC Inspection	D. Foster	J. Santos R. Ricci	0925	1544	6-49	517 ^m	
4-25-76	651	23-14.2N 77-33.4W	NAVELEX Search	L. Shumaker	R. Hollis J. Kirby	1127	1950	8-23	1180 ^m	
4-26-76	652	23-14.2N 77-33.4W	NAVELEX Search	D. Foster	E. Barrett C. Brown	0932	1838	9-06	1196 ^m	
4-28-76	653	23-14.2N 77-33.4W	NAVELEX Search	L. Shumaker	J. Kirby J. Snow	0849	1841	9-52	1187 ^m	
6-4-76	654	Woods Hole Harbor	ONR Test	D. Foster	W. Page R. Hollis	1445	1512	0-27	65'	
6-8-76	655	39-45.7N 70-41W	Biology	L. Shumaker	C. Wirsen R. Turner	1208	1248	0-40	600 ^m	Aborted - ground Svc bus
6-8-76	656	39-45.7N 70-41W	Biology	L. Shumaker	C. Wirsen R. Turner	1525	2032	5-07	1829 ^m	
6-10-76	657	38-18.4N 65-35.6W	Biology	D. Foster	K. Smith L. Cole	1304	2101	7-57	3651 ^m	
6-15-76	658	39-45.7 70-41	Biology	L. Shumaker	H. Jannasch J. Farrington	1003	2012	10-04	1771 ^m	
6-24-76	659	38-50N 72-31W	Biology	D. Foster	K. Smith L. Boyer	0946	1740	7-54	2196 ^m	Located all 3 B.S.

SUMMARY OF ALVIN DIVES - 1976 (CONT.)

U	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
	6-26-76	660	38-49.8N 72-31.1W	Biology	L. Shumaker	G. Rowe W. Gardner	0950	1958	10-03	2215m	
	6-27-76	661	38-50N 72-31W	Biology	D. Foster	R. Harbison L. Madin	0948	1216	2-26	600m	
	6-27-76	662	38-50N 72-31W	Biology	D. Foster	K. Smith L. Madin	1501	1758	2-57	620m	
	6-28-76	663	38-50N 72-32W	Biology	D. Foster	R. Harbison L. Madin	0925	1220	2-55	575m	
	6-28-76	664	38-50N 72-31W	Biology	D. Foster	R. Harbison L. Madin	1430	1846	4-16	1000m	
	6-29-76	665	38-50N 72-31W	Biology	L. Shumaker	G. Rowe K. Smith	0938	1914	9-46	2200m	
	6-30-76	666	38-50N 72-29W	Biology	D. Foster	J. McCarthy R. Haedrich	0655	1144	4-49	2300m	
5	7-8-76	667	39-51.4N 69-33.8W	NOAA	D. Foster	R. Cooper J. Schlee	1116	1735	6-19	693m	
	7-9-76	668	39-52.3N 69-35.8W	NOAA	J. Donnelly	J. Uzmann J. Schlee	1004	1622	6-18	1435m	
	7-10-76	669	39-47.1N 69-32.1W	NOAA	D. Foster	R. Cooper J. Schlee	0934	1504	5-30	1913m	
	7-11-76	670	39-52N 69-35.5W	NOAA	J. Donnelly	J. Uzmann J. Schlee	0942	1556	6-14	1510m	

ALVIN 1976

TO DATE 45 INDIVIDUALS HAVE MADE ONE OR MORE DIVES AS OBSERVERS ON ALVIN, REPRESENTING THE FOLLOWING 15 INSTITUTIONS AND ORGANIZATIONS:

FAIRLEIGH DICKENS UNIVERSITY

GENERAL ELECTRIC COMPANY

HARVARD UNIVERSITY

JAMAICAN GEOLOGICAL SURVEY

LAMONT-DOHERTY GEOLOGICAL OBSERVATORY

NAVAL AIR DEVELOPMENT CENTER

NAVAL ELECTRONIC SYSTEMS COMMAND (NAVELEX)

NAVAL FACILITIES COMMAND (NAVFAC)

NAVAL UNDERSEAS CENTER (NUSC)

OREGON STATE UNIVERSITY

STATE UNIVERSITY OF N.Y. AT ALBANY

SCRIPPS INSTITUTE OF OCEANOGRAPHY

TRACOR MARINE ACOUSTIC SYSTEMS

WESLEYAN UNIVERSITY

WOODS HOLE OCEANOGRAPHIC INSTITUTION

IT IS ANTICIPATED THAT THE FOLLOWING ADDITIONAL AGENCIES WILL PARTICIPATE IN OPERATIONS THIS SUMMER:

ATLANTIC ENVIRONMENTAL GROUP OF NOAA

ENVIRONMENTAL PROTECTION AGENCY

NATIONAL MARINE FISHERIES SERVICE

1976 ALVIN Funding

10 Oct. 1975: UNOLS Review Committee proposed cost apportionment

ONE	\$300,000
NSF	616,500
NOAA	<u>313,500</u>
Total	1,230,000

26 Jan. 1976: W.H.O.I. funding forecast

Joint Agreement	\$1,000,000	
NOAA Carryover	10,000	
Other Navy	<u>53,000</u>	(St Croix range)
Total	1,063,000	
Reduce deficit	<u>- 140,000</u>	(from 1975)
Available Total	923,000	

Recommendation to and agreement with ONR, NSF:
Reduce Schedule to 80 user days.

30 Jan. 1976: Proposal

NSF	\$400,000	
ONR	300,000	
NOAA	310,000	(with carryover)
Other Federal	<u>53,000</u>	(St Croix range)
	1,063,000	
Reduce Deficit	<u>- 133,500</u>	(1975, more precisely known)
	929,500	
Real total costs for 80 days	- <u>1,099,500</u>	
Estimated 1976 Deficit	- 170,000	

(Deficit to be reduced by savings or other dive sponsors)

1 April 1976: Internal Summary:

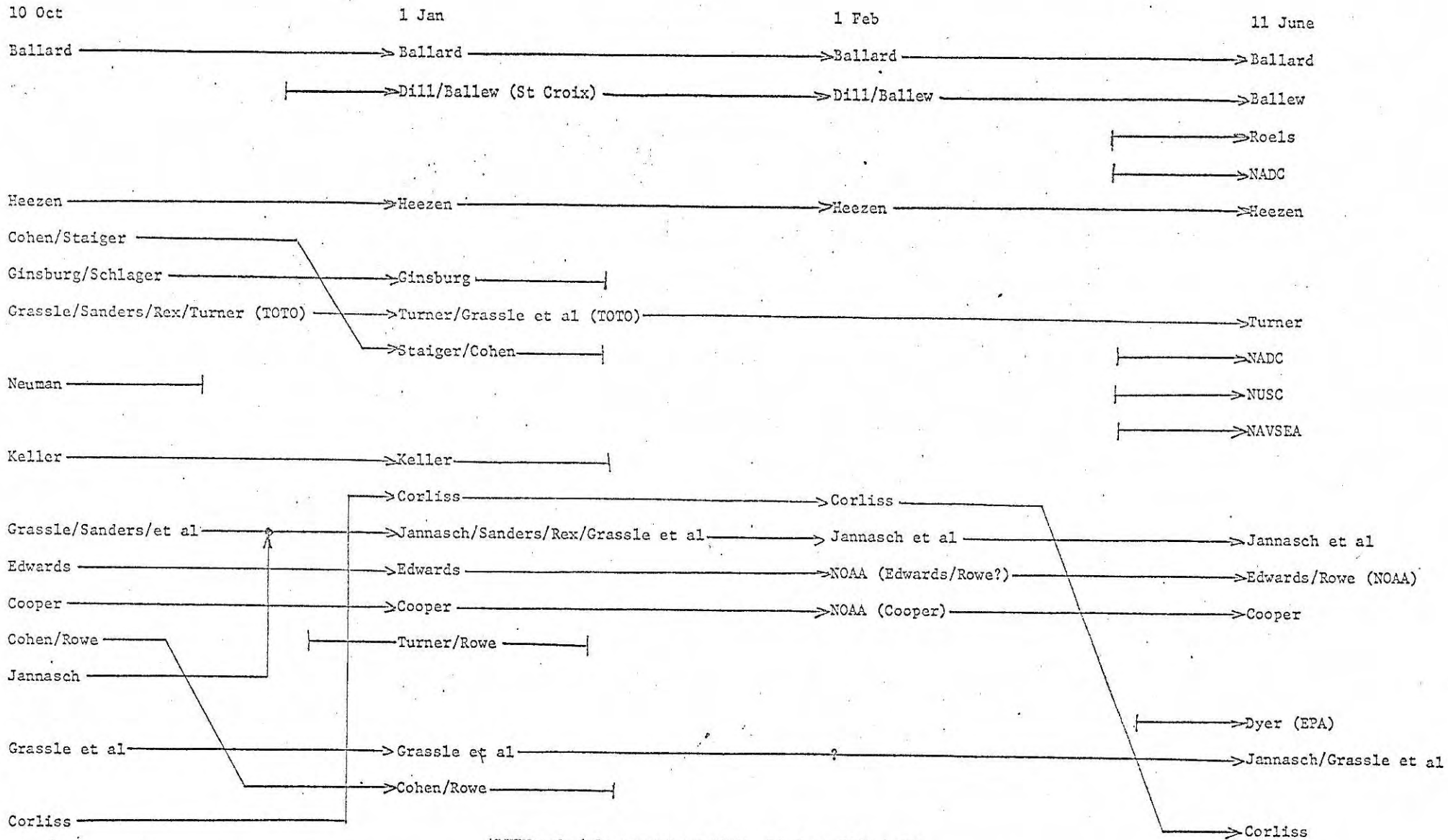
NSF	\$400,000
ONR	300,000
NOAA	310,000
St Croix Range	53,000
Deficit	<u>170,000</u>
Total required for year	1,233,000

10 May 1976: Proposals

To NSF for EPA:	\$ 62,500
NOAA	5,000

11 June 1976: Summary of status including new proposal

NSF	\$400,000	
ONR	300,000	
NOAA	<u>300,000</u>	(10,000 carryover retrieved for use for escort)
Basic Joint Total	1,000,000	
NOAA	5,000	
EPA (via NSF)	62,500	
Misc. Navy Tasks	<u>159,904</u>	(accounts receivable)
	1,227,404	
New Proposal to NSF	74,000	
EPA?	<u>15,625</u>	
Expected total income	1,317,029	
1975 carryover deficit	<u>- 133,500</u>	
Available for years operation	1,173,529	



ALVIN schedule gyrations 1976, 16 June 1976, RAF

INSTITUTION MEMORANDUM #8-76

Subject: R/V LULU Escort Policy
(This expansion of Institution Memorandum #2-71
replaces that Memorandum)

Escort requirements for at-sea operations involving R/V LULU

Since LULU has limited sea-keeping and support capabilities (as a function of her speed, size, configuration and equipment) arising from her special mission characteristics, situations will arise in which special support to LULU or the LULU/ALVIN system must be provided to insure the safety of the people involved, and to limit the nature of some risks involved in this complex engineering operation. This Memorandum sets out these situations and provides policy guidance for fulfilling the aim set forth above. It should be followed in such a manner that the means chosen will always increase the probability of a successful and safe operation. Mere pro forma compliance with the requirements set forth below, which might sometimes result in a decrease in the probability of success or safety of the planned operation, would not be in conformity with the intent of the policy.

The policy concentrates on support to LULU and to ALVIN when surfaced, since the principal safety requirements for ALVIN when submerged have been built into ALVIN itself in terms of its capability to surface, and since any rescue or support measures for the submersible while submerged involve requirements that are so massive that they must always be a very special operation.

- (a) General considerations affecting the need for an escort vessel include the mission, weather conditions expected in the operating area, proximity of accessible harbors, as well as the availability and proximity of pre-arranged on-call vessels or helicopters to the operating area. The decision as to whether or not an escort vessel is required rests with the Chairman of the Department of Ocean Engineering (subject to review by the Associate Director for Applied Oceanography and the Chairman of the Department of Facilities and Marine Operations) who will operate within the guidelines set forth below. Exceptions to these must be approved by the Associate Director for Applied Oceanography and the Chairman of the Department of Facilities and Marine Operations. Any vessel to be chartered by the Institution must be approved by the Marine Superintendent.

...../2

- (b) Conventional Oceanographic Cruises (Definition: At-sea operations which involve the collection of oceanographic information using conventional techniques not involving the use of submersibles or diver habitats.) The R/V LULU will require an escort vessel when operating at more than 48 hours steaming distance from an accessible harbor unless prior arrangements have been made for a stand-by vessel capable of reaching the operating area within 48 hours. (When operating at times or in areas where there is a high probability of severe weather, this time limit may, at the discretion of the Associate Director for Applied Oceanography and the Chairman of the Department of Facilities and Marine Operations, be reduced to 24 hours.)
- (c) Open Ocean Transits (Definition: Transits between ports or operating areas during which LULU may or may not be carrying a secondary system such as a habitat or submersible.) The same requirements as in the preceding paragraph shall apply.
- (d) Submersible Operations (Definition: Operations which involve the launching, surface controlling, and recovery of a manned submersible.) R/V LULU will require an escort vessel during all submersible operations unless:
 - (1) The dive site is within 30 miles steaming distance of an accessible harbor, or
 - (2) Prior arrangements have been made for quick reaction support (within 3 hours) to the operational site. (Quick reaction support may be ships or aircraft providing direct rescue capabilities or support to people on the surface, such as provision of rafts/boats, food, water, etc. as required by the situation on scene.)

When quick reaction support (not an on-scene escort) is to be used, the prior arrangements should include:

- (1) Agreement and understanding by the Coast Guard or other agency that the capability is in fact available;
- (2) A failsafe communications schedule with the reacting agency such that failure on LULU's part to send a regularly scheduled "operations normal" message, and failure to re-establish communication with LULU immediately thereafter, will result in automatic despatch of search and rescue capability (as pre-arranged) to the last known operations site;

- (3) Both LULU and ALVIN will be beacons so that they will be easy for search and rescue forces to find, and that they have such equipment that the search and rescue force can talk to either when on the surface;
- (4) LULU will be provided with a backup search radar capability. This is most important for cases in which we will depend upon backup land-based search and rescue, but should be provided in any case;
- (5) When quick reaction support is to be used, there must be firm provisions for best available weather and sea prediction for the area of operations to be available to LULU and ALVIN.

In circumstances where an escort is provided because the entire operation is out of range of easy shore reaction:

- (1) The escort should be equipped with an underwater telephone kit (over-the-side transducer) so that backup communication to ALVIN while submerged is available; (The Institution will make such a kit available.)
 - (2) While failsafe communications arrangements to shore probably cannot be made in all circumstances, there should be an especially strong attempt for regular, more than daily, "ops normal" messages to be sent to someone outside of the immediate operating area.
- (e) Diving Habitat Operations (Definition: Operations involving the support of a bottom sitting diver habitat.) R/V LULU will require an escort unless she is equipped with a recompression chamber and qualified medical personnel and is operating within 48 hours steaming distance of an accessible harbor.
- (f) Other Operations Requiring R/V LULU to Remain in Operating Area (Definition: Operations such as deep-sea drilling or similar activities in which R/V LULU is not free to leave scene of operation for extended period.) The requirements set down in paragraph (b) shall apply in this case, unless other specifications are made by the Associate Director for Applied Oceanography and the Chairman of the Department of Facilities and Marine Operations.

Paul M. Zyg

ALVIN USE REQUESTS

1977

07/15/78

INVESTIGATOR	INST.	NO. DIVES	AREA	ASSOCIATE INVESTIGATORS	PURPOSE	SPONSOR
GRASSLE	W.H.O.I.	5 10	Tongue of the Ocean W.H.O.I. Bottom Stas.	Sanders (W.H.O.I.)	Recruitment, growth and mortality of deep-sea benthic populations	NSF
JANNASCH	W.H.O.I.	8	W.H.O.I. Bottom Stas.	Wirsen (W.H.O.I.)	Rates of biological and organic geochemical processes in the deep ocean.	NSF
SASSAMAN	W.H.O.I.	1 2	Tongue of the Ocean W.H.O.I. Bottom Stas.	Grassle (W.H.O.I.)	Population and community structure of bathypelagic amphipods in the North Atlantic Ocean	NSF
TURNER I	HARVARD	4 4	Tongue of the Ocean W.H.O.I. Bottom Stas.	Sanders (W.H.O.I.) Grassle (W.H.O.I.)	Life History and ecology of the Xylophaginae and the contribution of wood & other plant material to nutrition	ONR
TURNER II	HARVARD	4 4	Tongue of the Ocean W.H.O.I. Bottom Stas.	Shumaker	Studies of Deep Sea Fouling Communities	ONR
	<i>(Biology Group)</i>	14 28	<i>Tongue of the Ocean W.H.O.I. Bottom Stas.</i>			
ATWATER	M.I.T.	20	Mid-Atlantic Ridge (FAMOUS Area)	MacDonald (SIO) vanAndel (OSU) Hopson (UCSB) Hall (Dalhousie)	Volcano tectonic evolution of rifted mid-ocean ridges and distributions of reversely magnetized rocks & their tectonic implications	NSF
CORLISS	OSU	15	Galapagos Rift	Von Herzen (W.H.O.I.) Dymond (OSU) Edmond (M.I.T.)	Hydrothermal processes on the Galapagos Rift	NSF

1977

INVESTIGATOR	INST.	NO. DIVES	AREA	ASSOCIATE INVESTIGATORS	PURPOSE	SPONSOR
DILL	W.I.L.	7	Virgin Islands	Ogden (W.I.L.) Moore (LSU) Burk (U. Tex) Gladfelder (W.I.L)	Canyon Investigations off St. Croix	(Unspec.)
FOX	SUNY (Albany)	8	Cayman Trough	DeBoer (Weslayan) Bryan (W.H.O.I.) Thompson (W.H.O.I.)	Crustal Layers (Layers 3 & possibly uppermantle) exposed along the fault- scarps of the mid-Cayman Rise	NSF
GINSBURG	MIAMI	8	Tongue of the Ocean	Hooke (Minn) James (Mem. U.) Slater (Colo)	Comparative morphology of erosional and depositional platform slopes around the Tongue of the Ocean	NSF
HEEZEN I	L.D.G.O.	12	George's Bank	Rawson (L.D.G.O.) Nesteroff " Lynde " Ryan "	Processes of sediment trans- port & erosion in outer por- tions of George's Bank Can- yons and contour current phenomena	ONR
HEEZEN II	L.D.G.O.	7	Puerto Rico Trench	Rawson (L.D.G.O.) Lynde " Rycin "	Geology of the flanks of Navidad, Silver and Gentry Banks on or near the north wall of the Puerto Rico Trench	ONR
HONJO	W.H.O.I.	3	Panama Basin	Takahashi (Queens) Erez (W.H.O.I.)	In-situ Δ pH and other elec- trictrolytic measurements in-sediment, at interface and water above the deep sea floor	NSF
LONSDALE	SCRIPPS	8	Carnegie Ridge	Mayer (SIO) Karas (SIO)	Abyssal sand dunes and a maganese nodule field study; sedimentation processes under influence of fast episodic currents	NSF

ALVIN USE REQUESTS

1977

INVESTIGATOR	INST.	NO. DIVES	AREA	ASSOCIATE INVESTIGATORS	PURPOSE	SPONSOR
NEUMANN	U.N.C.	12	Bahamas	Land (Texas) Bayer (Miami) Martens (OSU)	Lithified biohermal structures of the mar- gins of carbonate plat- forms	NSF
RECKSIEK	Moss Landing	5	Monterey Bay	Frey (C,F&G)	A survey of squid spawn- ing grounds in Monterey Bay	NOAA (Sea Grant)
STAIGER	U. Miami	12	Tongue of the Ocean	Cohen (NMFS) Rowe (WHOI)	Ecology of benthic fishes of Tongue-of-the Ocean	NSF
VITTOR	U. Alabama	12	Northern Gulf of Mexico	Crozier (Aia) Hopkins (UWF)	Fishery potential of the slipper lobster.	NOAA (Sea Grant)
WEATHERLY I	F.S.U.	4	Florida Straits	Cacchione (USGS)	Sediment Dynamics Experiment in the East Miami Terrace Trough	ONR
WEATHERLY II	F.S.U.	5	Florida Straits	Cacchione (USGS)	Secondary Flows in the Florida Current Bottom Boundary Layer	ONR
COHEN	NMFS	8	Tongue of the Ocean	Staiger (RSMAS) Pawson (Smithsonian) Rowe (WHOI)	Quantitative estimates of benthic fishes and large invertebrates in the deep sea.	NOAA
COOPER	NMFS	9	New England Slope	KELLER (OSU) Lambert (AOML) Folger (USGS)	Biology and Geology of New Eng- land continental shelf sub- marine canyons	NOAA
KOFOED	AOML	5	Bahamas	Keller (OSU) Lambert (AOML)	Sedimentary processes in submarine canyons	NOAA
RONA	AOML	8	Hatteras		Shelf sediment transport to the ocean basin.	NOAA

RECOMMENDED
TENTATIVE SCHEDULE

UNOLS ALVIN
REVIEW COMM.
6/18/76

RESEARCH SUBMERSIBLE ALVIN

1977

DATES	USE DAYS	AREA	INVESTIGATOR(S)	PROGRAM	RESEARCH FUNDING AGENCY
29 Nov - 8 Dec '76		TRANSIT TO TONGUE OF THE OCEAN, BAHAMAS			
9 Dec - 22 Dec '76	0	TOTO	Sea Trials and Certification		
3 Jan - 11 Jan	9	Bahamas	Staiger Cohen	Deep Fish Populations	NOAA NSF
14 Jan - 22 Jan	9	Bahamas - Puerto Rico	Heezen	Deep Sea Erosion	ONR
24 Jan - 31 Jan	8	St. Croix	Unassigned	Unassigned	Unassigned
1 Feb - 9 Feb		TRANSIT TO PANAMA			
10 Feb - 25 Mar	40	Galapagos I.	Corliss/Von Herzen	Hydrothermal Processes	NSF
26 Mar - 3 Apr		TRANSIT TO GRAND CAYMAN ISLAND			
5 Apr - 14 Apr	10	Cayman Trough	Fox	Crustal Layers along Faults	NSF
18 Apr - 22 Apr		TRANSIT TO MIAMI			
25 Apr - 28 Apr	4	Florida Straits	Weatherly	Sediment Dynamics & Current	ONR
1 May - 10 May	10	Tongue of the Ocean	Ginsburg	Erosion & Deposition	NSF
12 May - 21 May	10	Tongue of the Ocean	Turner/Grassle Sassaman	Biology	NSF ONR
24 May - 2 June	10	Florida Straits	Kofoed Neumann	Sedimentary Processes	NOAA NSF
5 June - 9 June		TRANSIT TO CAPE HATTERAS AREA			
10 June - 14 June	5	Cape Hatteras	Rona	Cont. slope & upper cont. rise sediments	NOAA
15 June - 18 June		TRANSIT TO WOODS HOLE			
19 June - 4 July		MAINTENANCE @ WOODS HOLE			
5 July - 14 July	10	Woods Hole Deep Stations	Jannasch	Deep Sea Biology	NSF
19 July - 28 July	10	Woods Hole Deep Stations	Turner/Grassle Sassaman	Deep Sea Biology	ONR NSF
2 Aug - 11 Aug	10	Atlantis Canyon	Cooper	Megabenthic Studies	NOAA
12 Aug - 22 Aug		MAINTENANCE @ WOODS HOLE			
23 Aug - 1 Sept	10	George's Bank	Heezen	Sediments transport	ONR
6 Sept - 15 Sept	10		Unassigned	Unassigned	Unassigned
20 Sept - 29 Sept	10	Woods Hole Deep Station	Turner/Grassle Sassaman	Deep Sea Biology	ONR NSF