

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

REPORT OF FOURTH ANNUAL MEETING

DSRV ALVIN REVIEW COMMITTEE
23-24 MAY 1977
WOODS HOLE, MASSACHUSETTS

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JUNE 1977



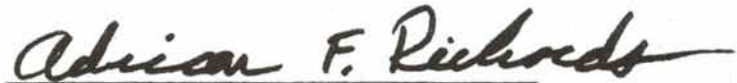
This Report combines the results of the Fourth Annual ALVIN Review Committee Meeting with material documenting calendar year 1976 and thus constitutes the Annual Report on this National Oceanographic Facility from the ALVIN Review Committee to the UNOLS Advisory Council and funding agencies.

Prepared by



Thomas Stetson
Executive Secretary
UNOLS

Released by



Adrian Richards , for the Committee
Chairman
ALVIN Review Committee

Summary of Committee Action

The following recapitulates action taken by the ALVIN Review Committee at the 23-24 May, 1977 meeting.

- . Approved in principle the Tentative Recommended Schedule included in this Report. (p. 7)
- . Declared the Pacific a major operating area (within operational limits) for 1979. (p. 7)
- . Declared 1980 open; allow competition until May 1978 when a decision should be made. (p. 7)
- . Endorsed need for Digital Data Logger, Camera System, Science Van Echo-sounder, and Transponder. Est. at \$94.5K. (p. 6)
- . Requested Executive Secretary to redo ALVIN flyer to better elicit information.
- . Requested formation of interim *ad hoc* subcommittee to organize an independent evaluation of the ALVIN Group's plan to upgrade the ALVIN/LULU System. (p. 8)
- . Request W.H.O.I. Management to (a) ascertain if confusion is generated by the use of terms Chief Scientist vs. Scientist-in-charge when applied to ALVIN operations; (b) ensure significant departures from the Committee's recommended schedule are endorsed by W.H.O.I. Administration and relayed to the Committee Chairman; (c) work with ALVIN Group to ensure complete archiving of data is performed for each dive or program, including data gathered by escort vessels.
- . An Executive Committee will be established to handle items demanding immediate attention. (p. 8)

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

ALVIN REVIEW COMMITTEE Fourth Meeting

0830, Monday May 23 & Tuesday May 24, 1977
W.H.O.I., Clark Laboratory, Rm. 237

AGENDA

1. Introduction, Richards
2. Selected Past Year Scientific Accomplishments
 - . Galápagos Re-Visited, Corliss
 - . Biology Highlights, Jannasch
3. Report on 1977 Diving Season, Shumaker
4. ALVIN System
 - . Use Day Redefined, Dinsmore
 - . LULU Upgrading, Shumaker
 - . Instrumentation, Marquet
 - . Data Archiving, Cruise Reporting, Stetson
 - . Science Coordination, Richards
5. Funding Agreement; Comments & Discussion by Supporting Agencies
6. 1978 Requests
 - . Summary
 - . Proposal Review
 - . 1978 Schedule
7. Long Range Plans
 - . Stanford Workshop
 - . Long-Range Schedule 1979 & Beyond
 - . ALVIN System Upgrading
 - . Support Vessel(s)
 - . 20,000 ft. conversion
8. Future Role of Committee vis-a-vis Management and Supporting Agencies
9. Elect Chairperson
10. Any other Business that May Properly Come Before the Committee

Please make your own travel arrangements, UNOLS Office will help if requested. Travel expenses for the Committee are reimbursed by UNOLS.

Luncheon will be served on both days. Please bring packet to meeting.

PLEASE PLAN TO STAY AT LEAST UNTIL 1700 ON TUESDAY

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

ALVIN REVIEW COMMITTEE

MINUTES OF MEETING

May 23 - 24, 1977

W.H.O.I., Clark Laboratory, RM. 237, Woods Hole, Mass.

The draft agenda was adopted with slight modification to the order of items. Discussions ranged widely during the two day meeting and some of these topics plus additional agenda items are reported on under Item 10, "Other Business."

1. Introduction. Two new Committee members were welcomed. The Chairman commented he felt substantial progress had been made during the past year, specifically:

- . A new three-year funding agreement (1978-1980)
- . Articulation of short range (<3 yr) and long range (>3 yr) recommendations
- . A smoother working relationship between the Committee, W.H.O.I. and NSF
- . Identification of SUBDEV GROUP I submersibles for possible civilian use
- . Deep Submergence Group's plan to upgrade ALVIN/LULU system
- . ALVIN user community moving to develop plans more than one season in advance

But, however good the above may sound much remains to be done. Some problems follow:

- . Develop plans to implement recommendations for ALVIN system upgrading and eventual replacement
- . Define better the responsibilities and action areas of the Committee, W.H.O.I. Administration, ALVIN group, and supporting agencies
- . Develop better working relationship with Navy submersible programs
- . Continue to develop user long-range plans for the effective scientific and technical use of the ALVIN system, perhaps by promoting topical or regional workshops
- . Apparent lack of concern for a coordinated ALVIN program by biologists compared to earth scientists

- . Emphasize to scientists that adequate proposal information must be furnished Review Committee
- . Given present operating mode, there is still a need for a scientific coordinator

Dr. Richards said in closing "One small era has passed. I am pleased to have been Committee Chairman during these formative years under UNOLS. I would like to thank all persons who have spent much time and effort in working in support of the ALVIN system."

2. Selected Past Year Scientific Accomplishments

Dr. Corliss reported on the recent Galápagos expedition in an enthusiastic manner. Good weather contributed to morale and 24 dives out of 24 planned were accomplished. He went into some detail of the workings of the OSU geochemical sampling equipment which records conductivity, temperature, depth, dissolved oxygen, and pH. As all are aware from press notices, the discovery of submarine biological communities deriving energy from volcanic vents (H₂S?) was more than a fascinating by-product. Nearly 95,000 photos were taken on the expedition.

Dr. Jannasch reported on his in-situ incubation studies in which samples were left at deep stations for periods ranging from 1 week to 15 months. Subsequent analysis indicates decreased microbial activity. He showed Viewgraphs of recently developed apparatus for collecting deep samples of water and/or sediment and designed so that temperature and pressure remain unchanged even when transported back to the lab. These pressure vessels permit in-out access as well. (See "Microbial Life in the Deep Sea" by Jannasch & Wirsén, Scientific American, June 1977, pp. 42-52).

3. Report on 1977 Diving Season. Mr. Shumaker reported the present diving season was going well despite LULU engine repairs in Panama. See Figure I for ALVIN/LULU 1977 cruise track. He mentioned possible cancellation of the Dyer August dives may impact the remainder of the schedule. This led into a discussion of ALVIN frame problems which was deferred.

4. ALVIN System

a. Use Day. Capt. Dinsmore defined "Use Day" as an operating day assigned for the accomplishment of a scientific or operational mission. This does not include vehicle/pilot certification operating days or non-diving transit legs except transits unique to single-user, distant projects. It does not include in-port days except when the major objective of the day is to install or otherwise service users' equipment; does include days of departure and arrival. This definition is used in the draft agency funding agreement.

b. LULU Upgrading. A presentation was made by Mr. Shumaker based in part on the Stanford Workshop recommendations setting forth what the ALVIN group at Woods Hole would like to see be done. See under Item 7 for

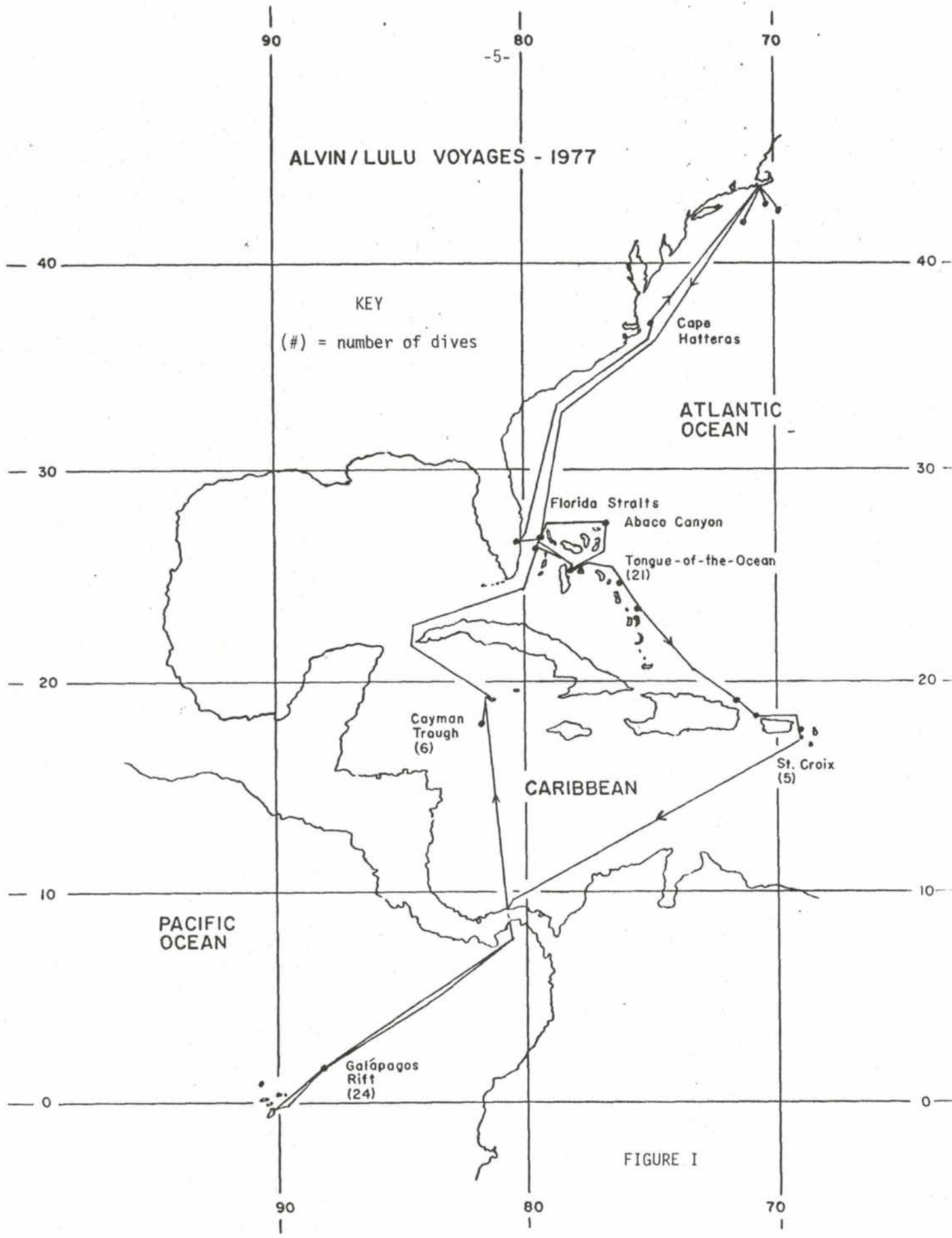


FIGURE I

action taken.

An option was suggested that if the scientific community recommended it, it is conceivable that ALVIN/LULU could be laid up for a year and all monies put towards upgrading.

c. Instrumentation. Mr. Marquet discussed the continuing program of upgrading ALVIN system instrumentation. Priority items to be funded are:

1. Digital Data Logger with:

Navigation	Altitude	
Time	Navigation transponders	
Pressure/Depth	Spares	
Gyro	Ship playback	\$ 50 K
2. Camera System & 2 Strobes		\$ 25 K
3. Echosounder for Science Van		\$ 11 K
4. Transponder for Relocating Remote Sites		\$ 8.5 K
	Est. Total	\$ 94.5 K

The Committee was asked to endorse these as priority items for upgrading instrumentation. Endorsement was forthcoming and is so recorded, recognizing the limitation imposed by the budget for such items.

d. Data Archiving/Cruise Reporting. Mr. Stetson introduced a memo from Mr. Wm. Dunkle, W.H.O.I. data archivist, indicating there was apparently no record of what samples or photos had been secured nor any indication as to where such might have gone on 13 recent dives. It is recalled this general problem was recognized and reported on by the Stanford Workshop. The Committee discussed the problem and recommended it be addressed by W.H.O.I. management.

e. Science Coordination. Dr. Richards indicated his belief that the present operating mode necessitates a science coordinator. Therefore, last December, he requested Dr. R. Ballard to so serve following a conference leading to this recommendation held with Capt. Dinsmore, Dr. Maxwell, Mr. Stetson and Dr. Richards. Miss Mary Johrde objected because of their experience with such coordination in similar circumstances had always been poor and requested that the appointment be withdrawn. When advised of this objection, Dr. Ballard informally resigned. The need for a science coordinator may be diminished if an Executive Committee is formed (see Item 10c).

A letter dated May 17, 1977 from Dr. G. Keller to Dr. A. Richards was introduced. It recognizes certain problems, some of long-standing, relating to ALVIN operations. The Committee went into executive session with W.H.O.I. administration representatives.

5. Funding Agreement. A draft copy of Memorandum of Agreement Concerning Support of DSRV ALVIN is appended. Agency representatives commented briefly on it.

- . It guarantees, within the availability of funds, support for the period 1978-1980.
- . Encourages a full use schedule of 180 use days rather than 150 as at present.
- . Establishes uniform cost structure for "inside/outside" users.

It was noted the report "The Continued Role of DSRV ALVIN" was not prepared in time for agency use in preparing the agreement. Woods Hole has agreed to a definition of "substantive" schedule change. It is recognized any change in ALVIN's schedule will impact the escort vessel.

6. 1978-1979 Requests. Requests for ALVIN use in 1978 were reviewed by the panel, a Tentative Recommended 1978 Schedule was composed and agreed upon in principle. This appears elsewhere in this report along with a table of requests for 1978 and 1979.

Action on individual proposals is detailed in the letters to potential principal investigators on file with UNOLS Office. App. A contains samples.

It was noted should Dr. Atwater et al. program be reduced, Dr. Fox's program was recommended for accommodation provided his proposal (as yet unsubmitted) survives the review process.

No specific recommendations were made on proposals in hand for 1979. The Committee declared the "Pacific to be a major operating area (within operational limits)" for 1979.

The Committee voted to leave the 1980 schedule open and to allow competition until May 1978, when a decision should be made.

The Committee's actions are summarized on Page 1 of this report.

7. Long Range Plans. Long range plans for the scientific use of ALVIN are treated as part of Section 6. Representatives commented as follows on future programs of their respective agencies.

a. NOAA - Dr. Beaumariage said programs emerging are:

- (1) OCSEAP (Outer Continental Shelf Environmental Assessment Program)
- (2) Sen. L. Weicker, Jr. has requested the help of NOAA in developing "a legislative base for a comprehensive national manned undersea science and technology program initiative," and input from Committee Members would be welcomed.
- (3) Developing interests in OCS Seattle northward to Alaska by 1980
- (4) Deep Ocean dumping?
- (5) Appeared to be East Coast emphasis for 1978-79.

- b. NSF - S. Toye indicated that apart from the applications already before the committee, other long range NSF use would be diffuse and unpredictable. Their unsolicited proposal mode makes "planning" a different matter.
- c. ONR - Dr. Pyle said Navy has three programs coming up which are 1) benthic boundary layer studies, 2) OBS inter-calibration, possibly in Pacific, 3) geology and geophysical studies on the E. Pacific Rise.
- d. System Upgrading - Mr. Shumaker presented a plan for upgrading the ALVIN/LULU System, based in part on recommendations made at workshops. This addressed such improvements as upgraded tender and instrumentation and increased depth capability. The Committee did not endorse this plan nor did W.H.O.I. management. It is believed an independent evaluation of this plan as well as a look at other options was desirable.

To this end an *ad hoc* committee is to be formed to examine present plans as put forth by the ALVIN group as well as other options and the cost of each. This group should include a naval architect, a representative from the ALVIN group, and a member of the user community.

Initially, however, R. Ballard and W. Marquet should meet with R. Ramsey of MUS&T Office and formulate plans for this *ad hoc* committee. It is hoped to have a report in hand for supporting agencies by September 1st.

8. Future Role of Committee. Lack of time precluded spending much effort on this item, but new committee must obviously address both short and long term problems re ALVIN/LULU system. Some of these have been previously mentioned, others are flagged in the reports listed in Appendix F. It is planned to address these questions at the August 9th meeting.

9. Chairman-Elect. Dr. Robert W. Corell (UNH) was unanimously elected Chairman. He agreed to serve.

10. Other Business & Misc. Items. Included here are miscellaneous remarks and other items added to the agenda.

- a. Dr. Richards mentioned he had asked Dr. van Andel to keep the Committee apprised through his French connection (CNEXO) of their submersible effort.
- b. Lt. Christensen indicated conversion of SEA CLIFF to 20,000 ft. capability was commencing. He said Navy submersibles on West Coast are available provided user has DOD funding. They must also be careful not to attract work more properly done by commercial operators.
- c. Executive Committee. For problems demanding immediate attention, when gathering the Committee as a whole is not feasible, it was felt advisable to establish an Executive Committee. This may consist of the chairman, past chairman, plus one other selected to address a specific problem. It was suggested the new chairman would like flexibility initially in this matter, so no further action taken.

- d. Vote of Thanks. The present Committee wishes to express their thanks to the retiring Chairman for his efforts during his tenure.
- e. Next Meeting. In view of urgency of some matters the next meeting was set for August 9, 1977, location not firm.

Post-Meeting Developments

In connection with Item 7d (p.8) Messrs Ramsey and Bush of the MUS&T Office did meet with Mr. Shumaker, manager of the Deep Submergence Group on June 17th to discuss the plans for upgrading LULU. They also had opportunity to inspect both ALVIN and LULU.

On June 20th, Dr. Corell, the new ALVIN Review Committee Chairman met with Mr. Stetson and Capt. Dinsmore to acquaint himself with some of the concerns expressed in this report.

It was learned from Capt. Dinsmore that W.H.O.I. Administration endorses the plans for upgrading LULU. This was not made especially clear at the May 23-24 meeting.

Dr. Corell is in favor of an Executive Committee to consist of himself, the past Chairman and one other selected to address a specific problem. For the August 9th meeting, however, it is contemplated to invite the entire Committee, because of the urgency of some problems and the fact there are a number of new faces.

It has been learned subsequent to the meeting that at least two of the funding agencies (NOAA & NSF) are prepared to request quotes on an independent evaluation of the plans for upgrading LULU.

PARTICIPANTS

The following were present for all or part of the meeting:

ARC Members (with term)

A. F. Richards, Lehigh, Chairman	2/75-6/78
*R. W. Corell, U.N.H.	7/76-6/79
J. B. Corliss, OSU	7/77-6/80
M. C. Gregg, U. of Washington	7/76-6/79
G. D. Grice, W.H.O.I.	2/75-6/78
D. E. Hayes, L-DGO	7/76-6/79
*K. K. Turekian, Yale	2/75-6/78
R. D. Turner, Harvard	7/77-6/80
A. E. Maxwell, W.H.O.I., <i>ex-officio</i>	2/75-6/78

NOTE: Drs. Corliss and Turner were approved by action of the UNOLS Annual Meeting May 12-13, 1977, and replace Drs. Keller and Hessler respectively. Dr. Tj. van Andel tendered resignation Sept. 29, 1976. Dr. Corell was elected Chairman to succeed Dr. Richards.

* Absent

Other Observers & Participants

Dr. Donald C. Beaumariage	NOAA/MUS&T
Dr. William P. Muellenhoff	NOAA/MUS&T
Mrs. Sandra D. Toye	NSF/OFS
Dr. Bruce T. Malfait	NSF/IDOE
Dr. Thomas E. Pyle	NORDA, Mar. G & G Div.
Lt. Thomas Christensen	NORDA, Oc. Tech. Div.
Dr. Ferris Webster	W.H.O.I.
Capt. R. P. Dinsmore	W.H.O.I.
Mr. Lawrence A. Shumaker	W.H.O.I.
Mr. William M. Marquet	W.H.O.I.
Dr. Robert R. Hessler	Scripps
Dr. Holger W. Jannasch	W.H.O.I.
Mr. Thomas Stetson	UNOLS

1978-1979 PROPOSALS FOR ALVIN USE CONSIDERED AT MAY 23-24, 1977 MEETING

1978

INVESTIGATOR	ASSOCS.	DIVES	AREA	PURPOSE	ESCORT	SPONSOR	OPTIMUM	ALTERNATE	COMMITTEE ACTION (DIVES)
1. Atwater, T. M.I.T.	R. Ballard C. Hopson H. Johnson K. Macdonald T. vanAndel J. Peirce D. Stokes	30	FAMOUS Rift Valley	Tectonic structures	GILLISS	NSF 2	26JN-10SE	15JN-30SE	20
2. Farlow, J. Yale	K. Smith	2	120m S. of W.H.	Red crab in situ		NSF 1 ONR 1	1978	1979	(join with Cooper)
2a. Fox, P. SUNY, Albany	S. DeLong J. Dewey J. Francheteau W. Kidd	15	Oceanographer F.Z.	Structure	KNORR?	NSF 1	1AU-30SE	15JN-1AU	10
3. Grassle, J.F. W.H.O.I.	L. Morse	5	TOTO	Benthic populations		NSF 3	Winter JN, AU	Spring JL	13 (with Turner)
4. Harbison/ Madin-WHOI	N. Swanberg V. McAllister	10 8-10	3644m Bot. Sta. Sargasso, Carib.	Midwater zooplankton		NSF 1	Summer		--
5. Heezen, B. L-DGO	W. Ryan R. Lynde M. Rawson	10	Bahama escarp- ment	K & Tert. history		NORDA 3	Winter	Fall	8
6. Heezen, B. L-DGO	E. Bonatti R. Lynde	6	Atlantis F.Z.	Structure		NORDA 3	Summer	Fall	--
7. Heezen, B. L-DGO	M. Rawson W. Nesteroff R. Lynde W. Ryan	10	Hydrographer Canyon	Sediment transport		NORDA 3	Summer		--
8. Heirtzler, J. W.H.O.I.	J. Milliman F. Grassle R. Houghton	8	N.E. Sea- mount (Michael)	Geology	KNORR?	NSF 1	21 days	May/June	--
9. Jannasch, H. W.H.O.I.	C. Wirsen C. Taylor R. Cuhe1	6	DOS 1&2	Microbial decomp. organic matter	No	NSF 1	Summer		6
10. Rona, P. NOAA/AOML	D. J. Swift	8	Cape Hatteras	Shelf transport system coupling		NOAA 3	MY-JN		7
11. Musick, J. VIMS	G. Grant R. Wetzel C. Wenner	7	Norfolk Canyon	Nektonic community structure	EASTWARD	NSF 3	Late May	Early June	4-5

- 1 Proposal will be Submitted
- 2 Proposal Submitted
- 3 Funded

1978
INVESTIGATOR

INVESTIGATOR	ASSOCS.	DIVES	AREA	PURPOSE	ESCORT	SPONSOR	OPTIMUM	ALTERNATE	COMMITTEE ACTION (DIVES)
12. Neumann, A.C. U. of NC	H. Mullins A. Hine R. Wilber A. Myers R. Land	10	N.W. Prov. Channel geology	Deep carbonate bank margin		NSF 3	Summer	Spring	5
13. Rona, P. NOAA/AOML	R. Ballard	15	MAR @ 26°N	TAG Project		NOAA 1	May	Sept.	--
14. Ryan, W. L-DGO	B. Hecker B. Heezen	4	N.W. Prov. Channel DSUP Site 98	Benthic communities	No	NSF 2	open		4
15. Schlager, W. U. of Miami	N. James R. Hooke R. Slater P. Eros	8	N.E. Prov. Channel TOTO	Erosion, car- bonate studies		NSF	AP	MR, MY, JN	5
16. Turner, R. Harvard MCZ	F. Grassle H. Jannasch H. Sanders K. Smith	4 4 4 4	TOTO TOTO DOS 1&2 DOS 1&2	Boring, fouling molluscs		ONR 3	DE77- JA78 AP-MY78 JN-JL78 SE78		8 (with Grassle)
17. Uchupi, E. W.H.O.I.	R. Ballard J. Austin	10	Corsair Canyon	Stratigraphy		NSF 1	JN-AU	MY, SE	6
18. Dill, R. St. Croix	B. Heezen		St. Croix vicinity	Geology; Biology			Open		--
24. Cooper, R. NOAA/NMFS	J.R. Uzmahn J. Schlee D. Folger	9	Oceanographer Canyon	Biology; Geology		NOAA 3	Aug. 1-15	Aug. 16-30	8
25. Malahoff, A. NOAA/NOS	R. Embley D. Fornari	8	Baltimore Canyon	Slump Physiography		NOAA 3	June	Summer	5
26. Butler, J. Harvard		Open	Bermuda	Pet. in sediments		NSF 2	Open		--
27. Disney Prod. [Hessler]		Unkn.	Galapagos?	Movie			---		--

- 1 Proposal Will be Submitted
- 2 Proposal Submitted
- 3 Funded

1979

INVESTIGATOR	ASSOCS.	DIVES	AREA	PURPOSE	ESCORT	SPONSOR	OPTIMUM	ALTERNATE	(NO COMMITTEE ACTION TAKEN ON 1979 PROPOSALS)
19. Grassle, J.F./ Sanders, H. W.H.O.I.	w/Jannasch below	4	Galapagos Rift area	Infaunal organisms		NSF 1	N078-FE79	One yr. later	
20. Jannasch, H. W.H.O.I.	C. Wirsen R. Cuñel	4	Galapagos Rift area	Bio. activity at submarine vents		NSF 1	N078-FE79	One yr. later	
21. Thompson, G./ Bryan, W. W.H.O.I.	H. Dick M. Mottl R. Ballard	15-20	Kane F.Z. 24°N	Rock sampling	KNORR or AII	NSF 1	Fall '79		
22. F. Spiess S.I.O. R. Ballard J. Dewey P. Fox C. Hobson W. Kidd R. Larsen B. Luyendyk K. Macdonald W. Pittman et al			E. Pacific Rise 21°N & 9°N	Geology, Geophysics		NSF, ONR 1	21°N early '79? 9°N early '80?		
23. Kofoed, J. NOAA/AOML	R. Bennett	10	Wilmington Canyon	Mass. phys. props. bottom current		NOAA 3	AP-MY	MY-JN	
24. Smith, K. S.I.O. R. Hessler H. Sanders J. Childress P. Jumars			San Diego Trough Patton Escarp.	BBL Dynamics at Deep Ocean Stations					

-13-

1 Proposal Will be Submitted
2 Proposal Submitted
3 Funded

APPENDICES

The following Appendices are attached to round out documentation for the National Oceanographic Facility DSRV ALVIN for the calendar year 1976.

- A - Following the meeting, letters were written to each potential principal investigator informing him of the Committee's action. Samples of two such are included. Copies of actual letters are available for Committee use and to other interested parties from the UNOLS Office.
- B - A copy of the agencies' funding agreement is attached covering the period 1978-1980.
- C - Investigators wishing to make use of Navy research submersibles will find how to proceed here.
- D - The LULU Escort Policy is appended for general information. Additional copies are available from the Deep Submergence Group at Woods Hole.
- E - A summary of calendar 1976 dives with location, sponsor, and purpose is tabulated.
- F - The reports listed in this Bibliography are available from the UNOLS Office or Deep Submergence Group, both at W.H.O.I.
- G - A profile of proposed use comparing years 1975-1978 is presented.
- H - A sample DSRV ALVIN Time Request is appended.

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

ALVIN Review Committee

Page 2
June 1st, 1977

June 1st, 1977

SAMPLE LETTER

Dear Dr.

At its recent meeting the UNOLS ALVIN Review Committee reviewed your request for submersible use for calendar 1978. A total of 26 proposals representing approximately 91 investigators with requests for more than 200 dives were considered. The Committee based its recommendations on scientific merit and demonstrated need for submersible use as well as feasibility for and continuity of ALVIN operations.

The attached very tentative schedule represents the Committee's current recommendations. Please note your assignment in this recommended schedule. Note also, there is no assurance that all programs shown will be funded at this time. If reductions occur, amendments will be made to the schedule based on the foregoing criteria and the priorities of the funding agencies.

We note the nature of your operation may not require an escort vessel but if one is required the Deep Submergence Group (DSG) may be able to obtain coverage from the USCG.

From your vantage point, the dates proposed for the use of ALVIN probably seem comfortably distant. But for your program to be smoothly integrated into the remainder of the schedule, you should begin now to ensure research support for the project and to identify the dates by which various other aspects of logistics and personnel planning must be completed, if you have not already done so.

If you do not already have full support for the proposed research activity, you should take steps immediately to secure it, or at least, to obtain a general commitment from the potential funding source(s). Until the research program has been favorably evaluated by the funding agency, your access to ALVIN is tentative. This uncertainty affects not only your plans, but those of the researchers scheduled to use the boat before or after your group. Even if the proposed ALVIN work is

to be carried out under an existing research grant or contract, the funding entity should confirm that the shipboard program is a relevant and appropriate aspect of the larger project.

Up to this point, your contact with the ALVIN Review Committee has probably been channeled through the Executive Office of UNOLS. The Committee via the UNOLS Office will be pleased to hear from you throughout the development and execution of your cruise; however, your primary point of contact from this point forward should be the DSG at W.H.O.I. The DSG will work with you to prepare for and carry out the cruise and you should request an ALVIN User Manual if you do not have one. You may reach them by telephone at (617) 548-1400, Ext. 407 or by mail at the following address:

Mr. Larry Shumaker, Manager
Deep Submergence Group
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

In the rare event that DSG principals are away, direct inquiries to:

Capt. R. P. Dinsmore
W.H.O.I. (617) 548-1400, Ext. 510

If you are going to develop a more detailed statement of the scientific objectives and work plan for the cruise than already received, it would be helpful if copies were provided to both the UNOLS Office and the DSG. If you prefer, this requirement can be met by sending copies of the research proposal(s), with, of course, any proprietary or personal material deleted.

Sincerely yours,

Thomas Stetson for
ALVIN Review Committee

TS/sjw

Encls: Escort Policy
1978 ALVIN Schedule

- cc: A. Richards
R. Corell
T. Christensen
W. Mueltenhoff
S. Toye
L. Shumaker

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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ALVIN Review Committee

June 1st, 1977

SAMPLE LETTER

Dear Dr.

At its recent meeting (May 23-24) the UNOLS ALVIN Review Committee reviewed your request for submersible use for calendar 1978. A total of 26 proposals representing approximately 91 investigators with requests for more than 200 dives were considered. The Committee based its recommendations on scientific merit and demonstrated need for submersible use as well as feasibility for and continuity of ALVIN operations.

The attached very tentative schedule represents the Committee's current recommendations as a result of this meeting. There is no assurance that all programs shown will be funded at this time. If reductions occur, amendments will be made to the schedule based on the foregoing criteria and the priorities of the funding agencies.

The Committee regrets your program was not accommodated. Since 1979 will be declared a "Pacific year" the Committee encourages you to develop your request and re-submit for 1980, if the work is to be done from ALVIN.

Sincerely yours,

Thomas Stetson for
ALVIN Review Committee

TS/sjw

Encl: 1978 ALVIN Schedule

- cc: A. Richards
- R. Corell
- T. Christensen
- W. Mueltenhoff
- S. Toye
- L. Shumaker

MEMORANDUM OF AGREEMENT CONCERNING SUPPORT
OF DSRV ALVIN

In the belief that DSRV Alvin is a unique national asset and provides a significant capability to the oceanographic research community; and in the further belief that a reasonable assurance of operating support is a necessary pre-condition to the establishment of a sound scheduling and utilization program, the Department of the Navy, the National Oceanic and Atmospheric Administration (NOAA), and the National Science Foundation (NSF), hereafter referred to as the supporting agencies, agree to the following:

I. GENERAL PROVISIONS AND UNDERSTANDINGS

1. Within the limits imposed by Congressional action and/or the availability of funds, the agencies will provide support for operating costs of DSRV Alvin for a period of three years, from 1 January 1978 through 31 December 1980. Funds will be provided in accordance with the formula set out in Section III, below.
2. Woods Hole Oceanographic Institution (WHOI) will operate DSRV Alvin during this period as a National Oceanographic Facility (NOF) of the University National Oceanographic Laboratory System (UNOLS). Proposals for use of Alvin by WHOI personnel shall be subject to the same reviews and constraints as all other proposals.
3. A Review Committee for DSRV Alvin named by UNOLS will examine requests to use Alvin and recommend to the operating institution those programs most appropriate for scheduling. Final selection of projects and establishment of scheduling priorities remain at the discretion of the supporting agencies. The Committee develops long range scientific utilization plans to encourage high quality investigators and programs and to maximize the future use of Alvin for multidisciplinary scientific and technological research. The Committee also provides recommendations to UNOLS and WHOI with respect to new techniques and instrumentation, operating policies, support and use arrangements, and other matters bearing on the furtherance of Alvin and other manned undersea platforms for oceanographic research.

4. Title to Alvin is retained by the Navy, and nothing in this agreement shall be construed as impinging upon the basic conditions controlling the assignment of the vessel for operation and maintenance to WHOI by the Navy. The submersible Alvin must be maintained in a material condition which will allow uninterrupted Navy submersible certification. If a situation arises in which primary Navy assets cannot perform a search and recovery mission, and it is within the capability of Alvin, the Navy retains the right under such an emergency to preempt Alvin scheduling. The costs during such a mission would be funded by the Navy in accordance with Section III, paragraph 7, below. Preempted projects would be appropriately rescheduled.

II. SCHEDULING AND UTILIZATION

1. The unique capabilities and logistic complexity of Alvin require careful planning to ensure effective and economical use. To this end, the following general principles should be observed in establishing utilization plans and schedules:

- Outlines of major programs including scientific objectives, operating areas, and probable sources of support should be identified at least two years in advance;

- Opportunities for smaller-scale or short-lead time programs to fill in schedule or take advantage of scientific or geographic circumstance should be carefully preserved;

- A "full use schedule" of approximately 180 use days per year should be planned to minimize unit costs.

2. Scheduling necessarily involves several iterations and extensive consultation among the principals. In general, however, the following cycle should be followed:

- X - 18 to 36 months -- Review Committee recommends to WHOI operating areas and key programs for the out-years based on scientific proposals and agency plans.

- X - 12 to 24 months -- Funding agency decisions confirm or reject major scientific programs; shorter lead-time programs develop to round out schedule.

-X - 9 to 12 months -- Operator institution proposes tentative schedule and operations budget for review by Review Committee and the supporting agencies.

-X - 6 months -- Operator institution completes arrangements for operations support and carries out specific pre-cruise planning and preparation with users. Operator institution ensures compliance with certification procedures.

-X -- Conduct cruise

3. Ultimate responsibility for implementing the schedule rests with the operating institution, which shall give appropriate consideration to the recommendations of the Committee, the requirements of the supporting agencies, and its own financial and operational responsibilities. Substantial changes not of an emergency nature must be approved in advance by the supporting agencies.

III. FUNDING

1. The provisions of this section apply to "Operations Costs" for DSRV Alvin and R/V Lulu only. The following categories of costs are specifically excluded from coverage under this agreement:

- Scientific project costs
- Costs of escort vessel(s) when required

2. The supporting agencies agree that they will guarantee utilization of DSRV Alvin for not less than the following number of use days per calendar year during the period covered by this agreement:

- National Science Foundation -- 90
- National Oceanic and Atmospheric Administration -- 30
- Department of the Navy, Office of Naval Research -- 30

3. The term use day as used in this Agreement is defined as an operating day assigned for the accomplishment of a scientific or operational mission. This does not include vehicle/pilot certification operating days or non-diving transit legs except transits unique to single-user, distant projects. It does not include in-port days except when the major objective of the day is to install or otherwise service users' equipment; does include days of departure and arrival.

4. Within the general framework outlined in paragraph 2, above, the signatory agencies may, by prior mutual agreement, trade some or all of the commitment within a given year among themselves. Changes made in accordance with this provision will be documented in writing by the parties, and such letter of agreement shall include provisions for reimbursement or other funding arrangement. Changes made in accordance with this provision shall not be deemed to alter the basic provisions of paragraph 2, above, in succeeding years.
5. The remaining portion of the schedule (approximately 30 days) may be made available at cost for additional use by the supporting agencies or their grantees or contractors, or other users.
6. The Woods Hole Oceanographic Institution shall prepare an operation plan and budget each year for prior review and approval by the principal supporting agencies.
7. All operating costs for use of DSRV Alvin by Federal agencies or their grantees or contractors, including, but not limited to, the signatories of this agreement, shall be distributed in direct proportion to time utilized. Daily rates for all users shall be established in accordance with regular Federal accounting and auditing procedures.
8. Solely for coherence of administration and accountability, funds provided by the principal supporting agencies under this agreement will be transmitted through a single grant or other arrangement administered by the National Science Foundation, which shall incorporate a statement of responsibilities of the parties consistent with this agreement.

IV. TERMINATION

1. Approximately one year before the termination of this agreement, the supporting agencies, UNOLS, and WHOI will review and evaluate the DSRV Alvin program to determine the future disposition and use of the system.
2. This agreement may, by mutual agreement, be renewed or extended.
3. An agency wishing to terminate this agreement prior to the established termination date of 31 December 1980, or alter its obligations hereunder must provide written notice to the other participants at least six months in advance.

V. LIAISON

1. For the Department of the Navy, Director, Ocean Research Office, NORDA
2. For the National Oceanic and Atmospheric Administration, Director, Manned Undersea Science and Technology Program
3. For the National Science Foundation, Head, Office for Oceanographic Facilities and Support

Date: _____

Signatures:

Stephen J. Franko, Chief
AAEO Branch
Division of Grants and Contracts

For the National Science Foundation

Donald C. Beaumariage, Director
Manned Undersea Science and Technology
Program

For the National Oceanic and
Atmospheric Administration

Robert J. Lundegard
Chief Scientist (Acting)
Office of Naval Research

For the Department of the Navy

Civilian Access to USN Submersibles

Access to Navy submersibles may be possible if Navy priorities warrant it and if you have DOD funding. In any event, a proposal of work should be directed to the proper program manager as listed below. Before doing so, initial contact should be made with Lt. Thomas Christensen, NORDA, Ocean Technology Division at (601) 688-4725, Bay St. Louis, Mississippi.

Naval Oceanographic Research & Development Activity (NORDA)

Bay St. Louis, Mississippi

Dr. Edward Lange	Physical Oceanography Div.
Dr. E. J. Green	Chemical Oceanography Div.
Dr. Thomas E. Pyle	Marine Geology & Geophysics Div.
Dr. Eric Shulemberger	Oceanic Biology Div.
Dr. Hugo F. Bezdek	Ocean Acoustics Div.

<u>Submersible Name</u>	<u>Location</u>	<u>Operating Depth</u>
SEA CLIFF	San Diego	6,500 ft.
TURTLE	San Diego	6,500 ft.
TRIESTE II	San Diego	20,000 ft.
NR-1	New London	2,300 ft.

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.

- (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. Zyr

SUMMARY OF ALVIN DIVES - 1976

Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time		Depth M/Ft.	Remarks
						Dive	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. VS 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

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	1620	7-08	2866 ^m	

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	3658m	82# Rock
2-20-76	624	18-21.2N 81-44.6W	NSF Geology	J. Donnelly	R. Ballard J. Fox	0926	1840	9-14	3657m	
2-21-76	625	18-22.8N 81-48.4W	NSF Geology	D. Foster	R. Wright K. Emery	0834	1455	6-21	2228m	
3-17-76	626	17-44.8N 64-56.6W	NAVFAC Inspection	D. Foster	R. Dill W. Gardner	1316	1842	5-26	1097m	
3-18-76	627	17-45.5N 64-57.8W	NAVFAC	D. Foster	R. Dill A. Suther- land	1352	1532	1-40	1135m	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	1220m	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	1108m	Inspected two arrays & 4300 yards cable
3-22-76	630	17-42.9N 64-57.2W	NAVFAC Inspection	D. Foster	A. Suther- land J. Williams	0942	1506	5-24	980m	Inspected two arrays & 4000' cable

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

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	3662M	Hill climb 2732m 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	3660M	
4-7-76	642	19-14N 68-38W	Geology	D. Foster	B. Heezen R. Lynde	0928	1722	7-54	3666M	
4-8-76	643	19-44.9N 68-43.1W	Geology	D. Foster	B. Heezen M. Rawson	0944	1759	10-14	3644M	
4-10-76	644	19-31.9N 69-10.2W	Geology	D. Foster	B. Heezen W. Nesteroff	0846	1646	8-00	3542M	
4-17-76	645	24-53.2N 77-40.2W	ONR Biology	L. Shumaker	R. Turner L. Cole	1106	1824	7-18	2071M	
4-18-76	646	24-53.2N 77-40.2W	ONR Training	D. Foster	R. Turner R. Hollis	0943	1818	8-35	2163M	
4-19-76	647	25-13.7N 77-45W	ONR Training	L. Shumaker	J. McCarthy	1449	1919	4-30	2830M	
4-20-76	648	25-18.2N 77-45W	NADC Salvage	D. Foster	F. Bliss J. Brown	1326	2214	8-48	2806M	Recovery
4-22-76	649	23-41.3N 77-36.6W	NUSC Inspection	L. Shumaker	J. Santos R. Ricci	0924	1558	6-34	1836M	Inspection

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.

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	
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	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
86	7-12-76	671	39-57.9N 69-36.5W	NOAA Biology	D. Foster	R. Cooper J. Schlee	1007	1521	5-14	675 ^m	
"	7-14-76	672	40-00N 69-37.4W	NOAA Biology	J. Donnelly	J. Uzmamm J. Schlee	0933	1550	6-17	221 ^m	
"	7-14-76	673	40-00N 69-35.7W	NOAA Biology	J. Donnelly	R. Hollis J. Schlee	1607	1708	1-01	202 ^m	
"	7-15-76	674	39-52.8N 69-43.8W	NOAA Biology	D. Foster	J. Uzmamm R. Cooper	0840	1233	3-53	374 ^m	
-	7-23-76	675	W. H. Harbor	Test	D. Foster	J. McCarthy R. Hollis	1359	1415	0-16	49'	
87	7-29-76	676	38-30.2N 72-09.3W	EPA Radwaste Recovery	J. Donnelly	R. Dyer B. Heezen	1045	1849	8-04	2789 ^m	Placed barrel noose. Placed clump.
"	7-30-76	677	38-30.5N 72-09.13W	"	D. Foster	B. Heezen K. Durrin	1117	2034	9-17	2805 ^m	Hooked up clump & drum
"	8-1-76	678	38-30.5N 72-09.13W	"	J. Donnelly	R. Dyer B. Heezen	1103	2011	9-08	2789 ^m	Drum recovered
"	8-2-76	679	38-27.8N 72-10.1W	"	D. Foster	R. Dyer P. Polloni	0954	1935	9-41	2788 ^m	
"	8-3-76	680	38-30.33N 72-10.56W	"	J. Donnelly	R. Dyer A. Ito	1122	1816	6-54	2768 ^m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
88	8-13-76	681	38-19.4N 69-35W	Joint Agreement Biology	D. Foster	H. Jannasch R. Cuhel	1000	1958	9-58	3650 ^m	Pinger im- ploded during descent. Re- covered long term pinger. Serviced elevator.
"	8-14-76	682	39-05N 70-09.7W	"	J. Donnelly	K. Smith C. Sassaman	1251	1904	6-13	2755 ^m	Serviced elevator.
"	8-15-76	683	39-04.8N 70-09.2W	"	D. Foster	K. Smith S. Hendrichs	1148	1949	8-01	2750 ^m	Inspected two elevators.
"	8-16-76	684	39-05.2N 70-09.8W	"	J. Donnelly R. Hollis	K. Smith	1030	1827	7-57	2753 ^m	Inspected two elevators.
"	8-17-76	685	39-45.3N 70-40.2W	"	D. Foster	L. Cole R. Turner	0833	1817	9-44	1767 ^m	Serviced two elevator low- erings. Re- placed long term pinger.
"	8-20-76	686	39-45.4N 70-40.4W	"	J. Donnelly	H. Jannasch C. Sassaman	1233	1958	7-25	1864 ^m	Search for old bottom station.
"	8-30-76	687	Woods Hole	Joint Agree- ment Test	J. Donnelly J. McCarthy	J. Jain	1529	1548	0-19	15m	Galapagos in- strument check

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
	11/30/76	688	Woods Hole	Joint Agreement Test	J. Donnelly R. Hollis	J. Gustavs- son	1500	1530	0-30	2m	Tethered trim dive
90	12/16/76	689	Andros Harbor	Joint Agreement Test	D. Foster R. Hollis	R. Flegen- heimer	1713	1729	0-16	20'	Test dive
"	12/17/76	690	24-45.5N 77-44W	Joint Agreement Test	J. Donnelly J. McCarthy	S. Cropper	1236	1404	1-34	988m	Test dive
"	12/18/76	691	24-50N 77-39.3W	Joint Agreement Test/in- doctrination	L. Shumaker	M. Currie H. T. Marcy	1253	1714	4-21	2085m	
"	12/19/76	692	24-45.5N 77-46.7W	Joint Agreement Test/Photos	D. Foster	M. Currie H. T. Marcy	0942	1105	1-23	200'	National G. Photos
"	12/20/76	693	24-41.4N 77-36.9W	NUSC Inspection	J. Donnelly	R. Austin R. Anderson	1024	1326	3-02	495m	
"	12/21/76	694	24-50N 77-39.3W	Joint Agreement Training/ Biology	D. Foster R. Hollis	R. Colegrove	1030	1509	4-39	2086m	

BIBLIOGRAPHY OF RECENT REPORTS CONCERNING ALVIN

- . Report of Meeting of UNOLS REVIEW COMMITTEE FOR DSRV ALVIN, October 10, 1975, Woods Hole, Mass.
- . Report of Meeting of UNOLS REVIEW COMMITTEE FOR DSRV ALVIN, Feb. 19, 1975, Woods Hole, Mass.
- . Report of Meeting of UNOLS REVIEW COMMITTEE FOR DSRV ALVIN, 17-18 June, 1976, Woods Hole, Mass.
- . RESULTS OF ALVIN WORKSHOP HELD IN WOODS HOLE, May 24th, 1976, J. Frederick Grassle, Convener
- . Institution Memorandum #8-76 R/V LULU ESCORT POLICY
- . ALVIN USERS MANUAL, W.H.O.I. Technical Memorandum #3-76, prepared by E. L. Bland, J. D. Donnelly and L. A. Shumaker, November 1976
- . EAST PACIFIC RISE SUBMERSIBLE PROGRAM WORKSHOP REPORT by K. Macdonald and F. N. Spiess, Scripps Institution of Oceanography held April 26-27, 1976
- . REPORT TO THE ALVIN REVIEW COMMITTEE ON LONG-TERM SCIENTIFIC UTILIZATION OF ALVIN, A Workshop held at Stanford University on 8 December 1976
- . DSRV ALVIN: A REVIEW OF ACCOMPLISHMENTS by A. G. Sharp and L. A. Shumaker, January 1977, W.H.O.I. Technical Report #76-114
- . REPORT OF THE UNOLS ALVIN REVIEW COMMITTEE TO THE UNOLS ADVISORY COUNCIL OF THE CONTINUED ROLE OF DSRV ALVIN, March 1977

Copies of the above are available from the UNOLS Office or the Deep Submergence Group, both at the Woods Hole Oceanographic Institution.

PROPOSED USE PROFILE

A profile of PROPOSED USE for 1978 and how it compares with the years 1975-1977 follows:

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
<u>GENERAL</u>				
Total number of proposals	25	30	24	23
Number of dives requested	115	160	210	207
Number of use days predicated	171	246	333	306
Number of principal investigators	25	31	21	19
Number of academic labs	10	14	18	10
Number of Federal labs	4	4	3	3
Number of other labs	1	1	0	0
<u>BY AREA</u>				
Northern Area (No. of Delaware, W of 60° W)				
Proposals	12	14	7	10
Use Days	83	91	85	111
Mid-Atlantic Area (Del. to Ga., W of 60°W)				
Proposals	4	3	1	2
Use Days	17	27	10	19
Southern Area (Fla., Bahamas & Carib.)				
Proposals	12	13	15	8
Use Days	72	114	152	92
Central Atlantic (E of 60° W)				
Proposals	--	--	1	3
Use Days	--	--	20	84
Pacific Ocean				
Proposals	--	--	3	--
Use Days	--	--	56	--
<u>BY AGENCY FUNDING RESEARCH (or proposed to fund)</u>				
ONR	43	50	66	51
NOAA	36	49	70	40
NSF	77	113	187	201
Other	10	17	0	0
Unspecified	5	17	10	14
<hr/>				
TOTAL	171 days	246 days	333 days	306 days
<u>BY DISCIPLINE</u>				
Biology	118	115	150	97
Geology/Geochemical	39	94	165	171
Physical	11	23	12	38
Engineering	13	14	6	0
<hr/>				
TOTAL	171 days	246 days	333 days	306 days
<u>USE DAYS PROPOSED BY WOODS HOLE PERSONNEL</u>				
W.H.O.I. personnel	59	89	43	75
Outside personnel	112	157	270	231
<hr/>				
TOTAL	171 days	246 days	333 days	306 days

UNIVERSITY NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM
DEEP SUBMERGENCE RESEARCH VEHICLE ALVIN
TIME REQUEST

To: UNOLS OFFICE
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

Date _____

USE OF THE ALVIN SUBMERSIBLE RESEARCH SYSTEM IS REQUESTED FOR _____
AS FOLLOWS: YEAR

PURPOSE (Project Title and brief outlines of scientific program) _____

CHIEF INVESTIGATOR (Name, Title, Address, Tel. No.) _____

OTHER SCIENTISTS INVOLVED _____

TOTAL NUMBER OF SHIPBOARD PERSONNEL _____

PROJECT REQUIREMENTS

NO. OF DIVES REQUESTED _____ PREFERRED DATES _____ ALTERNATE _____

AREA OF OPERATIONS (Attach page size chart showing location of dives and bathymetry).

NAME OF NEAREST PORT _____ DISTANCE _____ NAUT. MI.

ATTACH BRIEF DESCRIPTION OF PROPOSED ESCORT SHIP IF REQUIRED.

LIST SPECIAL EQUIPMENT REQUIREMENTS (include sensing, sampling and navigation require-
ments) _____

IS RESEARCH PRESENTLY FUNDED _____ AGENCY _____

IF NOT FUNDED, LIST AGENCY TO WHOM PROPOSAL IS TO BE SUBMITTED.

ATTACH RESEARCH PROPOSAL OR DESCRIPTION OF RESEARCH TO BE ACCOMPLISHED. INCLUDE
PREVIOUS WORK DONE WHICH SUPPORTS THE USE OF A MANNED SUBMERSIBLE AT THIS TIME.

SUBMITTED BY _____
SIGNATURE

APPROVED _____
DEPARTMENT CHAIRMAN
or
LABORATORY DIRECTOR

TITLE, ADDRESS & TEL. NO. IF DIFFERENT
FROM CHIEF INVESTIGATOR

Use back, or additional sheets if required.

2000

2000

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