UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

ALVIN REVIEW COMMITTEE

Summary Report

of the

May 6, 7, 8, 1987 Meeting

Fenno House
Woods Hole Oceanographic Institution
Woods Hole, MA

Minutes of Meeting

APPENDICES

ALVIN REVIEW COMMITTEE

Minutes of Meeting

May 6, 7, 8, 1987
Fenno House
Woods Hole Oceanographic Institution
Woods Hole, MA

The meeting was opened by provisional chairman Daniel Karig. (A provisional chair was made necessary by the resignation of Robert W. Corell.) Committee members, funding agency representatives from NSF and ONR, W.H.O.I. operator representatives and UNOLS Office staff present during the meeting:

ALVIN Review Committee
J.K. Cochran
J. Eckman
F. Jennings
D. Karig
W.F.B. Ryan
G. Thompson
A.A. Yayanos*

UNOLS Office
W.D. Barbee

Agency Representatives
K. Kaulum, ONR
B. Malfait, NSF
P. Taylor, NSF
J. McMillan, NSF

W.H.O.I.
R. Chandler
B. Martineau
B. Walden

UNOLS
G. Keller

*Substitute pre-arranged for this meeting

The ALVIN Review Committee Roster is Appendix I.

George Grice, on behalf of Woods Hole Oceanographic Institution, welcomed the Committee and provided information on arrangements.

ARC members Jody Deming and George Weatherly were involved in research cruises. A.A. Yayanos had earlier agreed to substitute for the review, so that the ARC could function at nearly full strength.

The Agenda (Appendix II) was reviewed. The sequence of items was modified during the meeting for convenience. Items are reported in the order addressed.

Comments on ALVIN program by funding agency representatives.

John McMillan, NSF, reported that the Foundation's budget submission was, so far, successful. In the Administration budget, NSF would receive an increase of about 18% for

FY-1988. At that level of increase Ocean Sciences, including both science and facilities programs, would receive significant increase.

Bruce Malfait, NSF, reported that within the global initiatives for geosciences the **Ridge Crest Processes** program would be critical to the ALVIN program. Development of the Ridge Crest Processes program is proceeding nicely.

Keith Kaulum, ONR, noted that in late 1986 it had become necessary to revise the ALVIN/ATLANTIS II schedule for 1987 operations. One reason necessitating a change was that in some cases projects critical to one of the three sponsoring agencies were not scheduled, etc. Mr. Kaulum asked that the Committee, in reaching their schedule recommendations, give consideration to the funding formula in the three-agency agreement (NSF 60%, ONR 20% and NOAA 20%) and provide explicit statement of each agency's share in their recommended schedule.

The ALVIN Review Committee accepted the request.

In response to a question, Mr. Kaulum explained that use of the Navy submersible SEA CLIFF on Minerals Management Service programs was the result of negotiations between MMS and OP23. (OP23 is presently the effective solicitor for SEA CLIFF time requests.) The arrangement will continue into 1988, so right now there is no window for academic use of SEA CLIFF.

The acquisition of a capable support ship for SEA CLIFF and TURTLE is progressing. OP23 has issued an elaborate RFP through MSC. They expect to let a contract in about mid-June.

There is a firm working arrangement for academic use of NR-1, and it has been used successfully (e.g., James Brooks, TAMU, investigation of seeps in the Gulf of Mexico during 1986).

The ALVIN Review Committee selected Feenan Jennings, TAMU, as its new chairman. He assumed the chair immediately upon selection.

Barrie Walden, Submersible Program Manager, W.H.O.I., reported on the ALVIN/ATLANTIS II program in 1986 and to date in 1987.

In 1986 ALVIN made 116 dives during the period April 26 through December 18. Of these, 10 were for testing, certification and training, 106 were science and engineering. Of the 106 science and engineering dives, two

were aborted (one because of science problems). The average depth of dive (including some very shallow test dives) was 2,588 meters.

In 1987, to date, ALVIN has made 63 dives, with but one unsuccessful. The operation of the submarine and science operations have been very successful since the overhaul/renovation in 1986. Although ALVIN operations have been rated fully successful on every project, there have been some problems: Not all equipment works or works well all of the time, e.g., date and logging equipment, sit cameras. The spare parts inventory aboard the ATLANTIS II is not adequate to facilitate repairs. There is no up-to-date users manual for ALVIN. (Currently, a three-four page List of Considerations is used.)

The overriding problem for ALVIN and the ALVIN Group remains, however, personnel. Fundamental changes in ALVIN (and ATLANTIS II) mode of operation have resulted in changed demands on personnel. The need for facility engineers/maintainers has increased at the expense of the need for operator-pilots. Long deployment, and intense usage are stressful to personnel. Although a complete solution has not been developed, some partial fixes are in place. The Group will now include a data systems technician. In addition to improving performance of ALVIN data acquisition, this person may also help to enable short, intermittent use of SEA BEAM.

Program Status: The Group is increasing time between ALVIN overhauls. (There will be a short maintenance period late in 1987, mostly to finish off minor items from the 1986 overhaul.) The next full periodic maintenance period will be in early 1989.

There are several existing, specific problems. The new manipulator has been installed and then removed, because of an intermittent problem not yet isolated. There have been some hydraulic problems, leaky valves, etc. Problems earlier reported with battery boxes are being managed to the degree that dives are not being aborted; a complete solution is still being sought. ALVIN is currently operating with but one of two 120 volt battery packs (weight problems). This still provides about 1-1/2 times previously available power duration.

A limited ALVIN rescue capability will be provided on ATLANTIS II. The system, provided with NOAA funding, is a tow and snag scheme that could recover an entangled ALVIN.

Plans are in place to reduce size of controllers for new electronic motors, provide adequate equipment spares (e.g., 35mm cameras) and improve personnel situation.

The 1988 season will begin in San Diego. Work is anticipated in the eastern Pacific, January through September-October. ALVIN/ATLANTIS II would then return to Woods Hole, where ALVIN would undergo a four- to six-month overhaul.

A brief review was made of those dive requests earlier recommended by the ARC, and still pending. Federal funding agency representatives provided funding information on individual science proposals if that information was available. These nine projects are shown in **Summary ALVIN Shiptime Requests Recommended Earlier, May, 1987,** Appendix III. **The Committee, as is its usual practice, agreed that these earlier recommendations for scheduling would stand insofar as their science funding decisions were favorable.** It was noted that in a few instances funding decisions could change the number of dives scheduled.

Review of Dive Requests for 1988. Dive requests for 1988, submitted for May 1987 review, are summarized in Appendices IV and V. These requests had been submitted in response to the UNOLS announcement **Opportunities for Oceanographic Research DSV ALVIN, 1988** (Appendix VI). Nineteen requests were received for a total of 207 dives. The requests were for investigators on Gorda-Juan de Fuca, California Basins, northern EPR and Galapagos, Guaymas Basin, southern EPR and the west Florida Escarpment. In addition to the dive requests, the ARC received information from NSF, NOAA and ONR representatives on the status of funding for each of the requests. **The Committee then reviewed the dive requests individually, in accordance with their Rules for Review** (Appendix VII).

The ARC recommended eleven requests for a total of 73 dives. (One request, for two dives, was scheduled in 1987. See 1987 schedule, Appendix VIII.) **One request was noted, but not reviewed, since it did not involve ALVIN dives. Five requests were not recommended. Two were tabled without review.** As noted above, nine requests for a total of 121 dives had been recommended earlier by the Committee. (See Appendix III.)

In their review and in making their recommendations for scheduling, the Committee was careful to limit their recommendations **to a total that could be accommodated within ALVIN/ATLANTIS II operations for 1988.** As had been noted in their announcement **Opportunities for Research,** (Appendix VI) in each recent year, at the end of their review and schedule development there remained a significant backlog of recommended dives. These backlogs have become awkward because investigators must be queued, funding is extended and planning is constrained. The ARC directed the Executive Secretary, UNOLS, to promptly inform potential investigators of individual ARC recommendations.

Schedule Recommendations for 1988. A provisional schedule for 1988 was outlined that included all of the dive requests recommended earlier and all of the May, 1987 recommendations. The 1988 schedule, Appendix IX herein, was developed on June 8. It was refined beyond the outline of May 8 to reflect further agency funding decisions and program requirements. The ALVIN/ATLANTIS II would take up 1988 operations with one project off San Diego, followed by work in Guaymas Basin, on the EPR and near the Galapagos. From June through September, work would be off the northwest coast, in Escanaba Trough, on the subduction margin off Oregon-California and on Gorda-Juan de Fuca. This tentative schedule includes, for NSF, 168 cruise days, for ONR 44 and for NOAA 22. **Agency representatives were advised.** After an additional project off San Diego and one on eastern Pacific seamounts, ALVIN/ATLANTIS II would proceed to Woods Hole, arriving in late November. **The ALVIN Review Committee expects that this provisional schedule will hold. Changes, if any, would reflect agency funding decisions still pending or operational considerations.**

ALVIN/ATLANTIS II Operational Policies. A general discussion of operational policies and current problems (especially concerning ALVIN and the ALVIN group) had already taken place during discussions of the **ALVIN Program in 1986 and to date in 1987** (see above). One additional issue was raised: classification of SEA BEAM data taken by U.S. ships within the United States' Exclusive Economic Zone. **The ARC agreed that this data classification issue was a serious one, an issue that potentially affects not only the ALVIN Program and use of ATLANTIS II SEA BEAM capability, but also a large part of the entire academic oceanographic community and several other ships in the UNOLS and federal oceanographic fleets.** The ARC noted that UNOLS and the UNOLS Advisory Committee are aware of the issue, and deferred to those bodies.

Recommendations for New ARC Members. Terms for three ARC members, Kirk Cochran, SUNY, Stony Brook, Jody Deming, John Hopkins University, and Geoff Thompson, Woods Hole Oceanographic Institution were expired. Additionally, during the meeting, Dan Karig, Cornell, submitted his resignation due to the press of other responsibilities. **The ARC accepted Dr. Karig's resignation with their expression of gratitude for his extended service to the Committee (since 1980).**

Committee discussion concerning recommendations for new appointments centered on the need for new members on the ARC, advantages of some carry over to provide continuity and perspective and the need to strike a balance between new blood and continuity. In reaching recommendations the Committee aimed for disciplinary and institutional balance.

The ARC recommended for appointment by UNOLS:

Douglas Nelson, University of California, Davis,
Geoff Thompson, W.H.O.I. (incumbent),
Mary I. Scranton, SUNY, Stony Brook,
James C. Casey Moore, University of California, Santa Cruz

Planning for 1989 (and beyond). Committee members discussed at length needs for ALVIN program planning, current ARC planning efforts and means for improvement.

Dan Karig, who had earlier led ARC studies of planning needs, noted that the Committee had never produced the planning results that it said it would and, in fact, had never reached a clear agreement on what their planning goals were. The ARC has stated **(in Prospectus on Long Range Planning, for ALVIN-supported Oceanographic Program,** distributed December 8, 1986) that they will "outline the interest, intent and tentative plans for the coming three year period." There are several shortcomings in existing planning: A sensible projection has never been achieved further than about two years (i.e., the year being scheduled and one year beyond). The ARC does not garner sufficient information to outline a focused medium-to long-range program; no formal effort is made to develop a long-range program and then solicit requests that go in that direction. Given the interest in the use of ALVIN (always oversubscribed) and the scientific importance of many recent ALVIN-enabled investigations, it was the ARC consensus that **more comprehensive ALVIN program planning and more critical program direction is needed.**

The Committee then took the following actions: **An ALVIN Planning Subcommittee was established.** William B.F. Ryan will chair the subcommittee with Dan Karig and Kirk Cochran as members.

The ALVIN Planning Workshops, held annually since December, 1982, were not adequate as the sole means for gathering ALVIN planning information. These workshops, held once or twice each winter, served to solicit investigator interest in using ALVIN and thereby served to identify some potential regions for future ALVIN work, kinds of critical investigations and target geophysical or biological phenomena. The Committee was concerned, however, that only a small segment of the community responded and that the letters of interest produced only a kind of vote on the future program rather than a reasoned development. **The Planning Subcommittee, with the concurrence of the ARC, decided to expand means for gathering ALVIN program planning information.** These means would include preparation, distribution and evaluation of a questionnaire on future

ALVIN WORK. ALVIN Planning Symposia would be held in 1987-88, but would be modified to reflect results from the community survey and from other sources.

The ARC agreed that their ALVIN Program planning must immediately take account of the Statement of Intent issued under the France-United States Bilateral to initiate a field project of multi-disciplinary investigations on the Mid-Atlantic Ridge. Preliminary scientific objectives are outlined in a letter from Donald Heinrichs, NSF, and accompanying report (Appendix X). Plans are for a two-year coordinated field effort in the period 1990-1992. A scientific task group is being formed under chairman Steven Hammond, NOAA. **The ARC moved that in order to assure coordination between the ARC and the task group, ARC members William Ryan and Geoff Thompson be named to the Scientific Task Group.** ARC Chairman Feenan Jennings will contact Dr. Hammond.

The ARC agreed that the Prospectus on Long Range Planning for ALVIN-Supported Oceanographic System did not warrant separate preparation and distribution. The Prospectus contains a sequence and process for ALVIN planning together with information on ALVIN scheduling for the current year and the next operational year (e.g., currently for the remainder of 1987 and for 1988) and much more tentative plans for the following year (1989 in this cycle). It was agreed that the changes in the planning process and philosophy (as outlined above) should be implemented before a planning outline is published. Further, specific information on current schedules, future schedules and future tentative plans is available after the late spring ALVIN Review Committee meeting (now), and should be published and distributed as a part of this report. The **ALVIN Flyer** should be continued.

Summary of ALVIN Program Plans.

In 1987 the ALVIN/ATLANTIS II will continue scheduled investigations in the Pacific (see Appendix VIII). After completing projects in the Marianas and Bonin regions, transit will be made to a series of investigations on Gorda-Juan de Fuca and the subduction region off Oregon and California. A short series of investigations will then be undertaken in California Basins, followed by a shipyard maintenance period in California.

In 1988 ALVIN/ATLANTIS II will take up investigations in California Basins, Guaymas, EPR, Galapagos, Escanaba, the subduction zone off California-Oregon, Gorda-Juan de Fuca, California Basins and eastern Pacific Seamounts (see Appendix IX). The ALVIN/ATLANTIS II will then return to Woods Hole for maintenance and overhaul.

In 1989 ALVIN will undergo a four- to six-month overhaul. Following that overhaul, ALVIN/ATLANTIS II will be available for reasonably extended operations in 1989. The Committee notes that interest has been expressed in many geographic regions that would be logistically feasible in the six to eight months that should be available in 1989. **The ALVIN Review Committee will solicit (through the ALVIN Flyer) and consider Requests for ALVIN dives:**

in the North Atlantic, including reasonably high latitudes,
in the Gulf of Mexico and Caribbean,
in the South Atlantic and equatorial Atlantic, and
in the eastern Pacific but probably excluding high latitudes.

The Committee realizes that it will not be operationally feasible to pursue investigations in all or even most of these geographic regions during 1989. They noted, however, that the Committee had received credible expressions of interest in ALVIN investigations within all of the areas. They anticipate strong dive requests from each of the areas, and were convinced that the strongest ALVIN program would result if they did not unduly constrain by region their request solicitation.

Other business. The Committee noted that most of the dive request received and reviewed in 1987 were well prepared and reflected strong sciences. They were concerned, though, that some requests did not justify adequately the number of dives or indicate the purpose of individual dives. Additionally, many requests did not indicate individual roles and responsibilities of members of the scientific team. **The ARC directed that the need for search information be emphasized in the next ALVIN Flyer.**

The meeting was adjourned at noon on May 8, 1987.

UNOLS Review Committee for DSRV ALVIN

(First Meeting 2/19/75)

1975

	Term Expires
A.R. Richards, Ch., Lehigh	7/78
C.L. Drake, Dartmouth	7/76
G. Grice, WHOI	7/78
R.R. Hessler, SIO	7/77
G. Keller, NOAA/AOML	7/77
S. Murphy, U/Wash	7/76
C. Rooth, RSMAS	7/76
K.K. Turekian, Yale	7/78
T.J van Andel, Stanford	7/77
A.E. Maxwell, WHOI, *ex-officio*	

1976

	Term Expires
A.R. Richards, Ch., Lehigh	7/78
R.W. Corell, UNH	7/79
M. Gregg, U/Wash	7/79
G. Grice, WHOI	7/78
D. Hayes, L-DGO	7/79
R.R. Hessler, SIO	7/77
G. Keller, OSU	7/77
K.K. Turekian, Yale	7/78
T.J. van Andel, Stanford (resigned 9/76)	
A.E. Maxwell, WHOI, *ex-officio*	

1977

	Term
R.W. Corell, Ch., UNH	7/76-6/79
J.B. Corliss, OSU	7/77-6/80
M.C. Gregg, U/Wash	7/76-6/79
G.D. Grice, WHOI	2/75-6/78
D.E. Hayes, L-DGO	7/76-6/79
A.F. Richards, Lehigh	2/75-6/78
K.K. Turekian, Yale	2/75-6/78
R.D. Turner, Harvard	7/77-6/80
A.E. Maxwell, WHOI, *ex-officio*	

1978

	Term
R.W. Corell, Ch., UNH	7/76-6/79
J.B. Corliss, OSU	7/77-6/80
J.M. Edmond, MIT	7/78-6/81
M.C. Gregg, U/Wash	7/76-6/79
D.E. Hayes, L-DGO	7/76-6/79
K.C. Macdonald, Scripps	7/78-6/81
D.C. Rhoads, Yale	7/78-6/81
R.C. Turner, Harvard	7/77-6/80
A.E. Maxwell, WHOI, *ex-officio*	

1979

	Term
R.W. Corell, Ch., UNH	7/76-6/82
R.N. Anderson, L-DGO	7/79-6/82
J.B. Corliss, OSU	7/77-6/80
J.M. Edmond, MIT	7/78-6/81
K.C. Macdonald, SIO	7/78-6/81
D.C. Rhoads, Yale	7/78-6/81
R.D. Turner, Harvard	7/77-6/80
M. Wimbush, URI	7/79-6/82
A.E. Maxwell, WHOI, *ex-officio*	

1980

	Term
R.W. Corell, Ch., UNH	7/76-6/82
R.N. Anderson, L-DGO	7/79-6/82
J.M. Edmond, MIT	7/78-6/81
D.E. Karig, Cornell	7/80-6/83
K.C. Macdonald, UCSB	7/78-6/81
D.C. Rhoads, Yale	7/78-6/81
G.T. Rowe, Brookhaven	7/80-6/83
M. Wimbush, URI	7/79-6/82
A.E. Maxwell, WHOI, *ex-officio*	

1981

	Term
R.W. Corell, Ch., UNH	7/76-6/82
R.C. Aller, U.Chicago	7/81-6/84
R.N. Anderson,L-DGO	7/79-6/82
D.E. Karig, Cornell	7/80-6/83
G.T. Rowe, Brookhaven	7/80-6/83
F.L. Sayles, WHOI	7/81-6/84
M. Wimbush, URI	7/79-6/82
A.A. Yayanos, Scripps	7/81-6/84
G.D. Grice, WHOI, *ex-officio*	

1982

	Term
R.W. Corell, Ch., UNH	7/82-6/85
R.C. Aller, U.Chicago	7/81-6/84
J.K. Weissel, L-DGO	7/82-6/85
D.E. Karig, Cornell	7/80-6/83
G.T. Rowe, Brookhaven	7/80-6/83
F.L. Sayles, WHOI	7/81-6/84
M. Wimbush, URI	7/82-6/85
A.A. Yayanos, Scripps	7/81-6/84
G.D. Grice, WHOI, *ex-officio*	

1983

	Term
R.W. Corell, Ch., UNH	7/76-6/85
R.C. Aller, U. Chicago	7/81-6/84
P.A. Jumars, U/Wash	7/83-6/86
D.E. Karig, Cornell	7/80-6/86
F.L. Sayles, WHOI	7/81-6/84
J. Weissel, L-DGO	7/82-6/85
M. Wimbush, URI	7/79-6/85
A.A. Yayanos, Scripps	7/81-6/84
G.D. Grice, WHOI, *ex-officio*	

1984

	Term
R.W. Corell, Ch., UNH	7/76-6/85
J.K. Cochran, SUNY	7/84-6/87
J.W. Deming, Johns Hopkins	7/84-6/87
P.A. Jumars, U/Wash	7/83-6/86
D.E. Karig, Cornell	7/80-6/86
G. Thompson, WHOI	7/84-6/87
J. Weissel, L-DGO	7/82-6/85
M. Wimbush, URI	7/79-6/85
G.D. Grice, WHOI, *ex-officio*	

UNOLS Review Committee
for DSRV ALVIN

1985

R. W. Corell, Chairman	7/76-6/88
J. K Cochran, SUNY-Stony Brook	7/84-6/87
J. W. Deming, Johns Hopkins	7/84-6/87
P. A. Jumars, U. Wash.	7/83-6/86
D. E. Karig, Cornell	7/80-6/86
W. Ryan, LDGO	7/85-6/88
G. Thompson, WHOI	7/84-6/87
G. Weatherly, FSU	7/85-6/88
G. D. Grice, WHOI, ex-officio	3/82-6/88

1986

R. W. Corell, Chairman	7/76-6/88
J. K. Cochran, SUNY	7/84-6/87
J. W. Deming, Johns Hopkins	7/84-6/87
J. Eckman, Skidaway	7/86-6/89
D. E. Karig, Cornell	7/80-6/89
W. Ryan, LDGO	7/85-6/88
G. Thompson, WHOI	7/84-6/87
G. Weatherly, FSU	7/85-6/88
G. D. Grice, WHOI, ex-officio	3/82-6/88

1987

F. Jennings, Chairman	7/87
J. K. Cochran, SUNY	7/84-6/87
J. W. Deming, Johns Hopkins	7/84-6/87
J. Eckman, Skidaway	7/86-6/89
D. E. Karig, Cornell	7/80-6/89
W. Ryan, LDGO	7/85-6/88
G. Thompson, WHOI	7/84-6/87
G. Weatherly, FSU	7/85-6/88
G. D. Grice, WHOI, ex-officio	3/82-6/88

ALVIN Review Committee
AGENDA
0800 May 6, 7, 8, 1986
Second Floor, Fenno House
Woods Hole, MA

Open the Meeting: The meeting will be opened by a provisional chair; since Robert Corell has resigned from UNOLS Offices, the ARC is without a chairman.

Select Chairman: UNOLS Charter, Annex II states "The Review Committee shall elect its own Chairman from among the members appointed by UNOLS. As of April, 1987, those members are: Kirk Cochran, SUNY, Stony Brook, Jody Deming, JHU, James Eckman, Skidaway, Feenan Jennings, TAMU, Don Karig, Cornell, William Ryan, L-DGO, Geoff Thompson, WHOI and George Weatherly, FSU. The member elected will assume the chair immediately.

Report on 1986 ALVIN/ATLANTIS II season, status of 1987 operations and operational/logistical factors for 1988: Barrie Walden and Woods Hole operators; summary reports, and highlighting any significant issues, problems, accomplishments.

Review of earlier ARC Request recommendations still pending. Several ALVIN Dive Requests were reviewed and recommended in 1986 and before, and are still pending (see Summary). Bill Barbee, Barrie Walden will summarize the extent of these pending recommendations; agency reps will provide funding status information.

Review of Requests for Dives in 1988: Committee discussion and review of new or modified dive requests for work in 1988. ARC review rules and procedures are attached. New Dive Requests have been distributed.

Schedule Recommendations for 1988:

1. Based on their reviews of New ALVIN Dive Requests and recommended Requests pending from earlier reviews together with operational/logistical information from WHOI, the ARC will develop their recommendations for 1988 schedule.
2. WHOI will develop candidate schedule for ARC review.
3. Review should include explicit registering with three funding agency reps to assure that candidate schedule accommodates each agency's critical program/budget requirements. Note that the ARC has agreed that ALVIN Dive Requests that cannot be included in the 1988 schedule will NOT remain pending. The Committee does not intend to have a queue of recommended ALVIN project at the end of 1988. (See 1988 ALVIN Flyer).

Comments on ALVIN program by funding agency representatives: J. McMillan, NSF, E.Finkle, NOAA and K. Kaulum, ONR.

ALVIN/ATLANTIS II Operational policies: ARC - Operators discussion of policy issues (e.g., structure of ALVIN Group personnel, ALVIN overhaul in 1988, schedule of overhauls, etc.).
Recommendations for new ARC members: Terms for Kirk Cochran, Jody Deming and Geoff Thompson expire. The Committee should discuss and recommend re-appointment or replacement candidates.

Planning for 1989 (and beyond):

1. UNOLS, in June, 1986 endorsed ARC recommendations including one to establish a sub-committee for **Long-range planning.** The sense of informal discussions among some ARC members was to establish an ARC vice chairman, who would also chair the long range planning subcommittee. The ARC should formally establish this (or their substitute) structure for advanced planning.
2. Based on interest and intent from December, 1986 Workshops, indications from the present meeting, agency program projections (e.g., agency long range plans, the U.S.-France Bilateral cooperative focused research program), etc., the ARC/subcommittee should develop broad recommendations for ALVIN/ATLANTIS II operations in 1989, 1990 and beyond.
3. The ARC should decide on whether or when to hold planning workshops, winter 1987/88.
4. It has been suggested that the ALVIN PROSPECTUS be discontinued. Information can be included in a program forecast section of the ARC Review Meeting Report. ARC decision.

ALVIN/Submersible Science Study: Report on progress toward the Study report.

Note: The hope is to complete items through **Review of 1988 Requests on the 6th,** complete **Schedule Recommendations for 1988** through **Recommendations for New Members** on the 7th, and devote the morning of the 8th to **Long Range Planning.** Hope to adjourn at about noon, 8 May.

SUMMARY
ALVIN SHIPTIME REQUESTS RECOMMENDED EARLIER

May, 1987

	INVESTIGATOR	ASSOCIATES	AREA	PURPOSE	SPONSOR	DATE	ALTERNATE	ESCORT*	DIVES	COMMITTEE ACTION
86-9 87-17	Bryan, W. B. (Resubmission)	Thompson, G.	EPR Axis 10° 12'N, 104°W	Petrological geochemical and structural variation with axial processes, EPR	NSF	Spring, 1987	1987		20	Recommended 1985, 1986
86-24	Kulm, V. Suess, E. Carson, B.	Moore, C. Lewis, B.	Central Oregon	Subduction processes in heavily sedimented trenches; lithification; fluid venting and structural geology	NSF	Summer 1987	Summer 1986		13	Recommended 1985; 12 dives scheduled 1987 13 pending
86-31	Mottl, M.	Von Herzen, R.	Juan de Fuca	Physical and chemical studies in submarine hydrothermal plumes.	NSF	Summer 1986	Summer 1987		12	Recommended 1985
86-34	Carney, R. S.	Knauer, G.	Central California Coast	Determination of relationships between spatical heterogeneity of recently deposited detrital material and distribution of megafaunal detritus feeders in deep sea	NSF	Feb. 1986, Aug. 1987	Mar.-June		12	Recommended
87-9	Childress, J.	Somero, G Fellbeck, H. Fisher, C. Vetter, R Karl, D. Hessler, R. Johnson, K.	Galapagos Rift	Hydrothermal vent biology coordinated study of ecology, chemistry, physiology, and biochemistry of the animals at the Rose Garden vent site.	NSF	Early 1988	Late 1987		14	Recommended 1986. Request was for 28 dives; Part (14) recommended.
87-14a	Sayles, R.L. Grassle, J.F.	Karl D. Soto, L. Molina-Cruz, A. Martens, C.	27N 111W	Geochemistry, biogeochemistry and benthic ecology at the Guaymas Basin hydrothermal vent system.	NSF	Dec 87	Jan-Mar 88		14	Recommended 1986.
87-15	Baross, J.A.	McDuff, R.E. Delaney, J.R. Lilley, M.D. Deming, J.W. Tuttle, J. Dahm, C. Becker, R.R. MacDonell, M.T. Colwell, R.R.	Near 48N 130 W	Multidisciplinary studies of Archaebacteria from Hydrothermal Environments.	ONR	Sept 1988	July or Aug 88		14	Recommended 1986

SUMMARY
ALVIN SHIPTIME REQUESTS RECOMMENDED EARLIER

May, 1987

	INVESTIGATOR	ASSOCIATES	AREA	PURPOSE	SPONSOR	DATE	ALTERNATE	ESCORT*	DIVES	COMMITTEE ACTION
87-16	Delaney, J.	McDuff, R.E. McClain, J.S. Dymond, J. Schultz, A. Baross, J. A. Lewis, B.T.R.	Near 48N, 130W	Test the hypothesis that variations in earthquake activity and hydrothermal output at submarine spreading centers are intimately linked in time and space.	NSF	July 1987	Aug 87		16	Recommended 1986
87-19	Hammond, D.	Berelson, W.	San Nicolas Basin, S. Cal. borderland, 33, 119W	Use ALVIN to emplace benthic flux chambers over specific bioturbation features on seafloor; observe operation of free vehicle benthic flux chamber.	NSF	1987			6	Recommended 1986.
				TOTAL DIVES PENDING:					**121**	

Summary by Region
ALVIN Shiptime Requests received in 1987

Gorda - Juan de Fuca

88-1	Edmond	Geochem, Geophysic	14 dives
88-5	Lewis	G & G	3
88-11	Johnson	G & G, Geochem	16
88-17	Lupton	G & G	3
88-18	Embley	G & G	20
			56

California Basins

88-6 (part)	Wishner	Biology	5
88-9	Jumars, Nowell	Biology, dynamics	6
88-10	Emerson	Geochem	2
			13

EPR (northern), Galapagos

88-4	Levin	Biology, dynamics	12
88-7	Sinton	G & G	24
88-12	Childress	Biology	25
88-13	Lutz	Biology	2
88-15	Batiza, et al	G & G	27
			90

Guaymas

88-2	Jannasch	Microbiology	8
88-3	Wiebe	Biology	0
88-14	Lutz	Biology	2
88-18	Simoneit	Geochem	4
			14

EPR (southern)

88-8	Craig	Geochem	20

W. Fla. Escarpment

88-16	Hecker	Biology	18

TOTAL, NEW REQUESTS 211

SUMMARY
ALVIN SHIPTIME REQUEST

May 1987
Woods Hole, MA

Investigator	Associates	Area	Purpose	Sponsor	Date	Altern	No. Dives	Remarks
1. Edmond, John M.	Morton, J.L. Gieskes, J. Abbot, D.	Northern Gorda 42N, 126W	Investigation of Gorda Ridge hydrothermal systems. Chemistry of hot springs on Northern Gorda Ridge an Escanaba Trough.	NSF	Aug-Sept, 1988	July-October 1988	14	Collaborative program with USGS. **Recommended 10 dives.**
2. Jannasch, H.W.	Grassle, J.F. Karl, D. Nelson, D. Wirsen, C. Jones, J.	Guaymas Basin 27N, 111W	Microbiological studies of the Guaymas Basin hydrothermal vent system.	NSF	Early 1988	Dec '87	8	Relates to 87-14a, Sayles, Grassle. **Recommended.**
3. Wiebe, P. H.	Van Dover, C.	Guaymas Basin 27N, 111W	Horizontal and vertical distribution and primary carbon source of benthopelagic plankton and benthic larval forms in the Guaymas Basin hydrothermal vent area.	NSF	When RV ATLANTIS is at Guaymas Site		0	Relates to 87-14a Sayles, Grassle. **Not reviewed; not ALVIN.**
4. Levin, L.A.	Pietrafesa, L. Janowitz, J. Nittrouer, C.A. DeMaster, D.J. Pilskaln, C. Wishner, K.	13N, 102W	Benthic boundary layer particle dynamics and biological production on deep seamounts.	ONR	Summer 1988		12	**Recommended.**
5. Lewis, B.T.R.		48N, 130W	Acoustic imaging of a hydrothermal system--the sub-sea floor picture.	ONR	Sept. 1988	Summer 1988	3	Relates to 87-16, Delaney, and 87-15, Baross. **Recommended.**
6. Wishner, K.	Gowing Levin, L.	(A) Santa Catalina Basin 33N, 118W (B) Volcano 7 13N, 102W	Ingestion Rates and Trophic relationships of Deep-Sea benthic boundary layer zooplankton. Purpose: to determine in situ ingestion rates, food, food sources, and response to enrichment of benthic boundary layer zooplankton.	NSF	Jan-March, June,'88	Sept-Dec '88	5(A) 10(B)	**Recommended 3 dives.**
7. Sinton, J.M.	Hey Batiza Christie Duennebier Kleinrock MacDonald	2N, 95W	ALVIN investigation of rift failure and rift propagation, Galapagos 95W - detailed geomapping and sampling.	NSF	1988	1989	24	**Not recommended.**

SUMMARY
ALVIN SHIPTIME REQUEST

May 1987
Woods Hole, MA

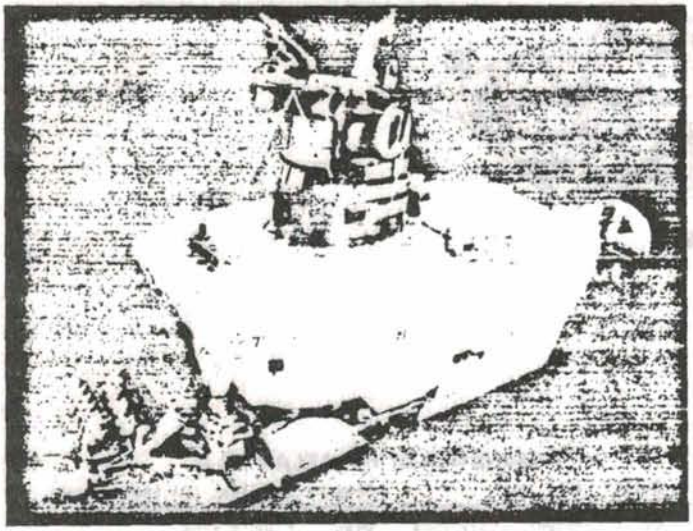
Investigator	Associates	Area	Purpose	Sponsor	Date	Altern	No. Dives	Remarks
8. Craig, H.	Hey, R. Ballard, R. Fox, P.J. MacDonald, K. Macdougall	EPR 26S, 112W to 32S, 112W	Submersible investigations on the East Pacific Rise: 26S to 32S: a combined study of hydrothermal vents, petrology, biochemistry, and tectonics from the Easter microplate to the Juan Fernandes microplate.	NSF	Jan '88	Feb '88	20	**Not recommended.**
9. Jumars, P.A. Nowell, A.R.M.		Santa Catalina Basin: 33N, 118W &/or other Borderline Basins	Organism-particle flow interactions (1) collect and deploy vertical spikes of conservative tracers for measuring horizontal bioturbation rates. (2) deploy & collect simulated animal pits to measure topographically-induced sedimentation.	ONR	Late 1988	See proposal	6	**Recommended 2 dives.**
10. Emerson, S.	Archer, D.	Santa Catalina Basin: 33N, 118W	Benthic O_2 & Carbonate Fluxes: microelectrode studies. Measurement of sediment interface gradients of pH and O_2 for determination of spacial inhomogeneity on the sea floor & verification of remote deployment methods of the profiler from shipboard.	NSF	Nov. 1988	Jan. 1988	2	**Recommended; scheduled in 1987.**
11. Johnson, H.P.	Edmond, J. Franklin, J. Tunnicliffe, V.	Middle Valley on the Northern Juan de Fuca Ridge 48N, 129W	A detailed geophysical, geochemical, geological and biological study of a sedimented spreading center.	NSF	July/ Aug 1988	June-Sept 1988	16	**Not recommended.**
12. Childress, J.J.	Fisher, C. Felbeck, H. Hessler, R. Johnson, K. Karl, D. Somero, G. Vetter, R.	Galapagos Rift vent site	Galapagos 88 Hydrothermal Vent Biology Program. Coordinated study of water chemistry & biology (ecology, physiology, biochemistry & microbiology) of the biological communities at The "Rose Garden" & two other deep sea vent sites on the Galapagos Rift.	NSF	April 1988		25	14 dives were recommended on Childress, 87-9. This request reiterates his request for a total of 25 dives. **Recommended 11 additional dives.**

SUMMARY
ALVIN SHIPTIME REQUEST

May 1987
Woods Hole, MA

Investigator	Associates	Area	Purpose	Sponsor	Date	Altern	No. Dives	Remarks
13. Lutz, R.A.	Fritz, L.W.	Rose Garden, Galapagos Rift 00°43.25'N, 86°13.48'W	Studies of Molluscan Shells from deep-sea hydrothermal vents. Objective: determine the rates of biological & geological processes at deep-sea hydrothermal vents through measurements of molluscan shell growth & dissolution.	NSF			2	Relates to Childress, 88-12. **Recommended 1 dive.**
14. Lutz, R.A.	Fritz, L.W.	Guaymas Basin 27N, 111W	Studies of Molluscan Shells from deep-sea hydrothermal vents. (See above #13).	NSF			2	Relates to Sayles, Grassle, 87-14a. **Recommended 1 dive.**
15. Batiza, R. Bender, J. Langmuir, C.		8N, 104W to 12N, 104W	Petrologic, volcanic & tectonic investigation of small ridge offsets (devals) along the EPR (8°-12°N)).	NSF	Spring 1988		27	**Not recommended.**
16. Hecker, B.	Grassle, J.F. Grassle, J.P. Lutz, R. Turner, R. Wishner, K.	26N, 85W W. Fla. Escarpment	Biological Studies on structure & dynamics of deep-sea communities @ W.F.E. (epifaunal & infaunal).	NSF	1988		18	**Not recommended.**
17. Lupton, J.	Washburn, L.	48N, 129W Endeavor Ridge	Mixing & Entertainment in Hydrothermal Vent Plumes	NSF	1988		3	With Delaney/et.al. **Tabled without Review.**
18. Simoneit, B.	Gieskes	Guaymas	Geochemistry of interstitial waters in Guaymas Basin, Escanaba Trough, & Middle Valley	NSF	1988		4	With Sayles/Grassle et.al., 87-14a. **Tabled without review.**
19. Embley, R.	et. al.	Juan de Fuca Ridge	Buoyant plume sampling, geological mapping and vent chemistry, Axial Caldera	NOAA	Aug 1988	July, Sept. 1988	20	Request not available during Review meeting.

The University—National Oceanographic Laboratory System



Opportunities for Oceanographic Research

DSV ALVIN

at the Woods Hole Oceanographic Institution

1988

The Deep Submergence Vehicle ALVIN

The Deep Submergence Vehicle ALVIN, based at Woods Hole Oceanographic Institution, is designated a UNOLS National Oceanographic Facility. Diving time is available for qualified research projects selected on the basis of scientific merit and compatibility of the proposed research.

ALVIN is owned by the U.S. Navy under the purview of the Office of Naval Research and is operated by the Woods Hole Oceanographic Institution. Operations are supported under a Memorandum of Understanding among the National Science Foundation, the National Oceanic and Atmospheric Administration and the Office of Naval Research.

Planning and Scheduling for ALVIN

The UNOLS ALVIN Review Committee (ARC) makes recommendation for ALVIN-ATLANTIS II areas of operation two and three years in advance and makes schedule recommendations one year in advance of the operating year. Over the last several years the task of matching dives available on ALVIN with requests from skilled individual investigators has become critical and requires careful advance planning.

As one basis for advance planning, the ARC conducts annual workshops (December, 1986 for this planning cycle) to solicit interest in using ALVIN two, three and more years into the future. On the basis of these workshops and Notices of Intent, the ALVIN Review Committee will, early each year, issue a PROSPECTUS outlining interest in and the ARC's recommended tentative plans for ALVIN two and three years in advance (i.e., the 1987 PROSPECTUS will recommend broad areas of operation of 1989 and beyond.)

Through this **Opportunities for Oceanographic Research, DSV ALVIN**, the ARC solicits requests for ALVIN dives, to be reviewed by the Committee in May, 1987. On the basis of that review, the ARC will make 1988 schedule recommendations to the three funding agencies and to the W.H.O.I. operators.

Recent and Scheduled Operations

At their May, 1986 meeting, the ALVIN Review Committee reviewed and made recommendations on **ALVIN Time Requests** for operators in both 1987 and 1988. On the basis of recommendations for work in the Atlantic and eastern Pacific, a schedule was developed and distributed for 1987. A number of ARC - recommended **Time Requests** remain for work in Pacific, to be scheduled in 1988.

The 1986 ALVIN diving program, supported by the ATLANTIS II, was again highly successful. Early in the year the ALVIN underwent extensive maintenance and renovation. All major objectives of the overhaul were met, and certification was renewed. User reports are that ALVIN is a new, improved vehicle with greater maneuverability, more speed, greater payload and/or increased bottom time. Scientific research operations began in May with investigations on the Mid Atlantic Ridge and elsewhere in the northwest Atlantic. In October ATLANTIS II/ALVIN departed for the Pacific via the Panama Canal. Research investigations were made off the west coast of Florida, in the Panama Basin and off California before year's end in San Diego.

The 1987 program was scheduled on the basis of ARC recommendations of May, 1986 with modifications in December, 1986. Operations will be resumed off California followed (late January) by transit to the western Pacific with projects near the Hawaiian Islands and mid Pacific. April-July will be devoted to investigations in the Mariana region and in the Bonin Island Arc. After return transit across the Pacific, investigations will be made off the northwest U.S. coast and off California. At year's end the ATLANTIS II will be in shipyard maintenance, in California.

Requests for 1988

ALVIN Review Committee recommendations (May, 1986) for nine projects totaling about 120 dives are pending for 1988. These investigations are all in the eastern Pacific, from Gorda, Juan de Fuca to the East Pacific Rise. Further, W.H.O.I. operators advise that ALVIN/ATLANTIS II overhaul periods must be scheduled late in 1988. Thus, a schedule for 1988 will be developed for work in the eastern Pacific, to include a substantial period on Gorda-Juan de Fuca, work off California, Mexico, on the East Pacific Rise and, perhaps, in the Atlantic, convenient to a Panama-Woods Hole transit.

The ARC invites ALVIN Time Requests for 1988 only for investigations generally in the area indicated in the eastern Pacific and along a Panama-Woods Hole track. Schedule recommendations for 1988 will include the nine projects recommended earlier as well as recommended requests from this 1987 call. Investigators associated with the nine already-recommended Time Requests need not re-submit although they may, if they wish, provide updated research plans or funding information.

The Committee is concerned that in each recent year at the end of their review and development of a schedule for the subsequent operating year there remained a significant number of **recommended investigations and ALVIN dives (e.g., the nine recommendations noted above). These backlogs are awkward for** individual investigators who are queued for a year or more, to funding agencies who must extend funding periods and to program planners who are unduly constrained. Hence, the ALVIN Review Committee has agreed that at their May, 1987 review, **no ALVIN TIME REQUESTS for dives to occur later than 1988 will be considered. Investigations that cannot be accommodated in the 1988 schedule will revert to a tabled status.**

ALVIN Time Requests through UNOLS are for the use of the facility only and no research or travel funding is implied. **Associated research proposals should be submitted in a timely fashion through usual channels to funding agencies. (NSF has re-iterated their policy that proposals involving the use of UNOLS ships must meet the proposal target date of June, preceding year.)**

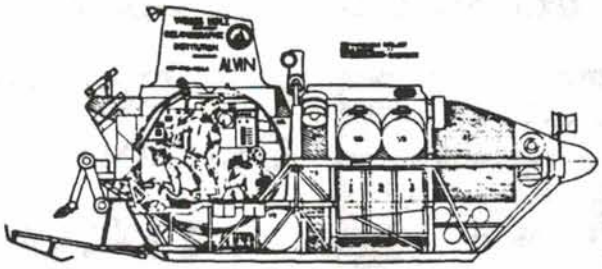
Time requests will be reviewed by the ARC at their May, 1987 meetings to recommend projects. Criteria for the review include scientific merit and suitability for ALVIN/ATLANTIS II. The committee will make schedule recommendations based on recommended Requests.

Principal Investigators are expected to meet pre- an post-cruise obligations that may exist for operations within jurisdiction of foreign states.

Requests for 1988 must be received in the UNOLS Office by April 10, 1987. Requests should include the Request form or a copy together with the additional information on the intended investigation as requested in this announcement. Failure to meet the submission deadline will jeopardize consideration of the Time Request. Additional planning information will be provided prior to a call for 1988 Time Requests. Requests for 1988 Time received at the May, 1986 review will be tabled.

Proposals submissions should be addressed to:

Chairman, ALVIN Review Committee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195
Telephone: (206) 543-2203



DSV ALVIN

Description of DSV ALVIN

Length: 7.6 meters (25 feet)
Beam: 2.4 meters (8 feet)
Draft: 2.1 meters (7 feet) surround
Full Speed: 2 knots
Cruising Speed: 1 knot
Cruising Range: 5 miles submerged
Displacement: 18 tons
Endurance: 72 hours
Normal Drive Duration: 6-10 hours
Depth Capacity: 4,000 meters (13,120 feet)
Complement: 1 pilot, 2 scientific observers
Ownership: The submersible ALVIN is a Navy owned national oceanographic facility operated by the Woods Hole Oceanographic Institution and jointly supported by the National Science Foundation, the Office of Naval Research and the National Oceanic and Atmospheric Administration.
Communications: Sonar telephone, voice or code (submerged); marine band UHF radio (surface).
Navigation: Gyro compass; magnetic compass; forward looking horizontal scanning sonar system (CTFM); echo sounder; indicators for depth and altitude; long baseline acoustic positioning system (by request).
Electrical Power: Three banks of lead-acid batteries configured for 120 VDC (450 Amp. hours) and 30 VDC (450 Amp. hours). A limited amount of 115 volt 60 cycle AC power is also available.
Hydraulic Power: The Science basket is supplied with 1 GPM of 1500 PSI hydraulic oil for science applications.
Data Logging: Most of the information obtained from the permanently installed instrumentation is logged on 3-1/2 inch computer disks. Also, selected data is superimposed on the video camera images and recorded on 1/2" VHS tape. Contact the ALVIN group for more information.
Additional capabilities: The submersible is designed to be versatile with respect to payload, space and power available to meet the differing needs of scientists using the vehicle. Scientific equipment which remains on board most of the time includes two remotely controlled mechanical arms, two 35 mm. cameras and a closed circuit video system with recorder. Additionally, specialized equipment such as hot water samplers, precision temperature sensors, a magnetometer and increased navigation capability is available but requires advance notice and may require additional funding for installation and operation. Contact the ALVIN group for further information.

Description of RV ATLANTIS II

Built: 1963
Beam: 44 feet (13 meters)
Gross Tonnage: 1,529 tons
Crew: 27
Length: 210 feet LOA (64 meters)
Draft: 16 feet (5 meters)
Disp.: 2,300 L tons
Scientific Personnel: 9 ALVIN support team plus 1 corpsman plus 19 scientists
Main Engines: Two GM 12-567E diesel engines driving through reduction gears with variable speed, hydraulic clutches. 2,000 shp.
Bow Thruster: 800 hp trainable. DC motor driving from main gear PTO.
Ships Service Generators: Two 480/120 volt AC 300-KW generators driven by CAT 353 diesel engines.
Propellers: Twin screw: 3 fixed blade; bronze.
Ownership: Built under grant from NSF. Conditional title rests with W.H.O.I.
Speed: Cruising: 11.0 knots
Full: 13.5 knots
Minimum: Dead Slow
Endurance: 45 days Fuel Capacity: 90,000 gallons
Range: 9,000 miles
Laboratories: wet - 400 square feet
dry (4) - 3,500 square feet plus 28' by 13' ALVIN hanger
Sewage System: Two type III holding tanks; Five to ten days endurance.
Ship is equipped for full range of oceanographic observations and work. One trawl winch: 30,000 feet 1/2" cable. One CTD winch 27,000 feet 0.303" cable or 30,000 feet 3/16" wire.
One marine crane: 20 ton capacity
One hydraulic powered A-frame: 18 ton capacity for launch and recovery of ALVIN.

To obtain further information regarding ALVIN/ATLANTIS II system capabilities or specialized equipment contact:

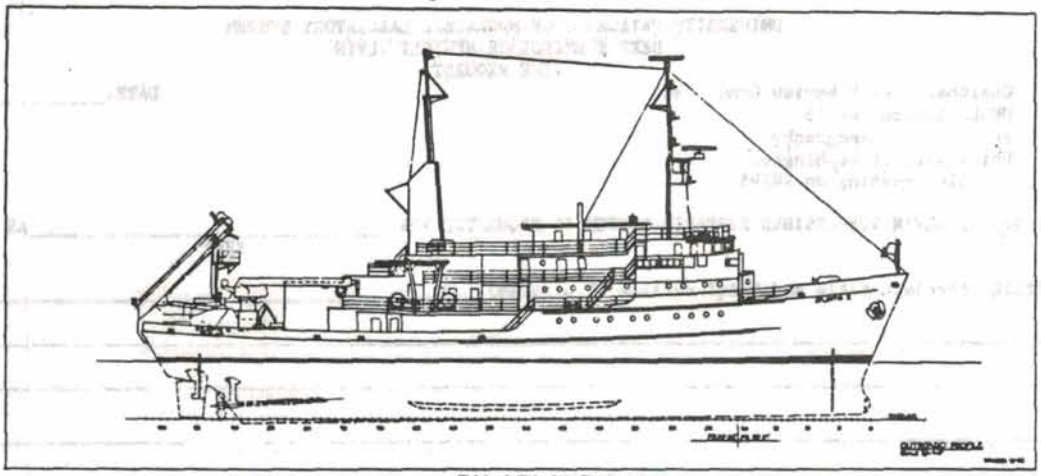
Woods Hole Oceanographic Institution
Woods Hole, MA 02543
Telephone: (617) 548-1400

ALVIN Information:

Barrie B. Walden, Submersible Program Manager
Extension 2407

ATLANTIS II Information:

Donald A. Moller, Marine Operations Coordinator
Extension 2277



RV ATLANTIS II

Submission of ALVIN Time Requests

Requests for the use of DSV ALVIN should be initiated by sending a completed time request form (copy overleaf) to: Chairman, ALVIN Review Committee, c/o UNOLS Office, WB-15, School of Oceanography, University of Washington, Seattle, WA 98195. Requests may be made by scientists and engineers at any university or research institution in the United States, and should be supported by a research proposal (preferred length: 4-8 pages, single spaced for items 1 to 6) which specifically addresses each of the following:

1. The nature and significance of the proposed research;
2. The scientific questions being asked and the approaches that would be used toward their resolution;
3. Justifications of the need for ALVIN to do this work;
4. The research site(s) and its justification;
5. Number of dives required, justification for the number of dives and any seasonal consideration;
6. Likely requirements for future ALVIN dives (not requested here) for completion of the research;
7. Proposed number of scientists and engineers in the party;
8. Curricula vitae of principal participants;
9. Potential or current support for the proposed research effort;
10. List of publications resulting from any previous ALVIN work;
11. Any special engineering required for dive operations;

NOTE: (1) If operations are to be carried out in foreign waters, the required clearances should be requested as early as possible. Collaboration with foreign scientists is encouraged.

(2) If the program is not already funded, a comprehensive proposal must be submitted by the investigator to his sponsoring agency in the conventional way. The ALVIN Review Committee will submit scheduling recommendations for consideration by the research sponsor. Final scheduling depends on approval of the pertinent research proposal by the funding agency.

ALVIN Review Committee

~~R.W. Corell,~~ University of New Hampshire
J. ~~W. Cochran,~~ State University of New York, Stony Brook
~~J.W. Deming,~~ John Hopkins University
James Eckman, Skidaway Institution of Oceanography
~~D.E. Kerig,~~ Cornell University
W.F.B. Ryan, Lamont-Doherty Geological Observatory
G. Thompson, Woods Hole Oceanographic Institution
G. Weatherly, Florida State University
G. Grice, Woods Hole Oceanographic Institution, ex-officio

Secretary
Nelson

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

To: Chairman, ALVIN Review Committee
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, Washington 98195

DATE:_____

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

PURPOSE (Project title and brief outline of program)_____

_____

_____

_____

PRINCIPAL INVESTIGATOR (Name, Title, Address, Tel. No.)

_____

_____

_____

OTHER INVESTIGATORS INVOLVED

_____

_____

_____

PROPOSED CHIEF SCIENTIST_____

TOTAL NUMBER OF SHIPBOARD PERSONNEL_____

PROJECT REQUIREMENTS

NO. OF DIVES REQUESTED____ PREFERRED DATES_____ ALTERNATE_____

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

_____

NAME OF NEAREST PORT_____ DISTANCE_____ NAUT.MI

ATTACH BRIEF DESCRIPTION OF PROPOSED ESCORT/SURFACE SUPPORT SHIP IF ONE IS REQUIRED. LIST SPECIAL EQUIPMENT REQUIREMENTS (E.G., SENSING, SAMPLING AND NAVIGATION REQUIREMENTS).

_____

_____

COUNTRIES FOR WHICH RESEARCH CLEARANCE WILL BE REQUIRED:_____

FUNDING STATUS

_____
FUNDED

_____
FUNDING AGENCY

_____
GRANT NO:

_____
AMOUNT OR ANNUAL RATE BEGIN DATE DURATION

_____

_____
NOT FUNDED

_____
PROPOSAL SUBMITTED:____ TO:

WILL BE SUBMITTED:____
DATE: AMOUNT REQUESTED:

_____

NEW PROPOSAL ____ or RENEWAL OF GRANT NO:

_____

ATTACH RESEARCH PROPOSAL OR PRELIMINARY PROPOSAL ADDRESSING POINTS LISTED ON OVERLEAF

SUBMITTED BY_____
SIGNATURE

TITLE, ADDRESS & TELEPHONE NO. IF DIFFERENT FROM PRINCIPAL INVESTIGATOR

_____

_____

_____

APPROVED_____
DEPARTMENT CHAIRMAN
or
LABORATORY DIRECTOR

April 15, 1987

Rules for Review of ALVIN Dive Requests
ALVIN Review Committee

1. Requests for ALVIN dives, having been solicited by the ALVIN Flyer will be reviewed annually, and principally at the ARC meeting held for that purpose in about May.

2. Extraordinary requests (e.g., those for which a later submission is warranted, or those for which ARC recommendations and funding decisions do not agree) will be reviewed at ad hoc meetings either by telephone or opportunistic assembly. The Committee discourages late submissions.

3. There is potential for conflict of interest on any dive request originating at a Committee member's institution or if any investigator listed on the request is from a member's institution.

4. The Chair will raise the questions of conflict of interest at the beginning of consideration on each request for dives. Notes for the meeting will reflect these queries and actions of the member(s) involved.

5. If a Committee member is listed on a request (or is, in fact, actively involved) that member will be excused from the room for all discussion, consideration and voting on that request.

6. For requests originating at Committee member(s)' institutions, or with investigators from their institutions, those Committee members so connected will be excused from the room for all discussion, consideration and voting on that request except that at the invitation of the balance of the Committee (and with that member's concurrence) members connected only by institutional affiliation may comment on requests. However, in no case will those members vote on the request in question.

7. If there remains a question concerning conflict of interest concerning any member(s) for an individual request for dives, it will be decided by vote of the balance of the Review Committee.

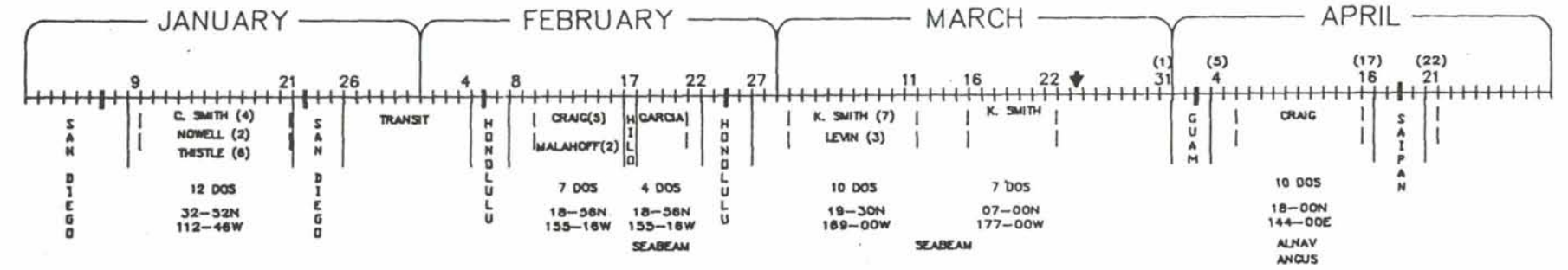
8. Voting Committee members will vote to rank individual requests for dives as:

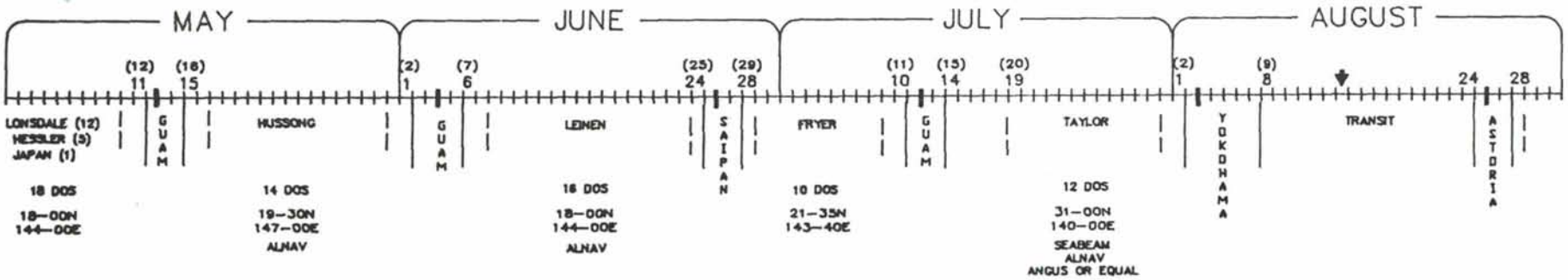
    1, outstanding
    2, excellent
    3, fair
    4, poorest ranking
    5, tabled--not ranked.

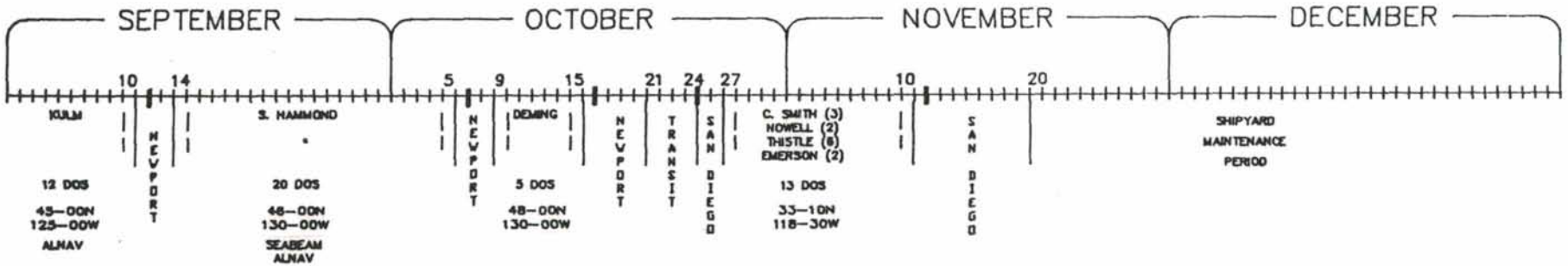
1987

ALVIN OPERATIONS

1 JUNE 1987
~~19 MARCH 1987(E)~~
~~1/ JAN 1987~~
~~20 DEC 1986~~
~~12 JUNE 1986~~
~~8 MAY 1986~~





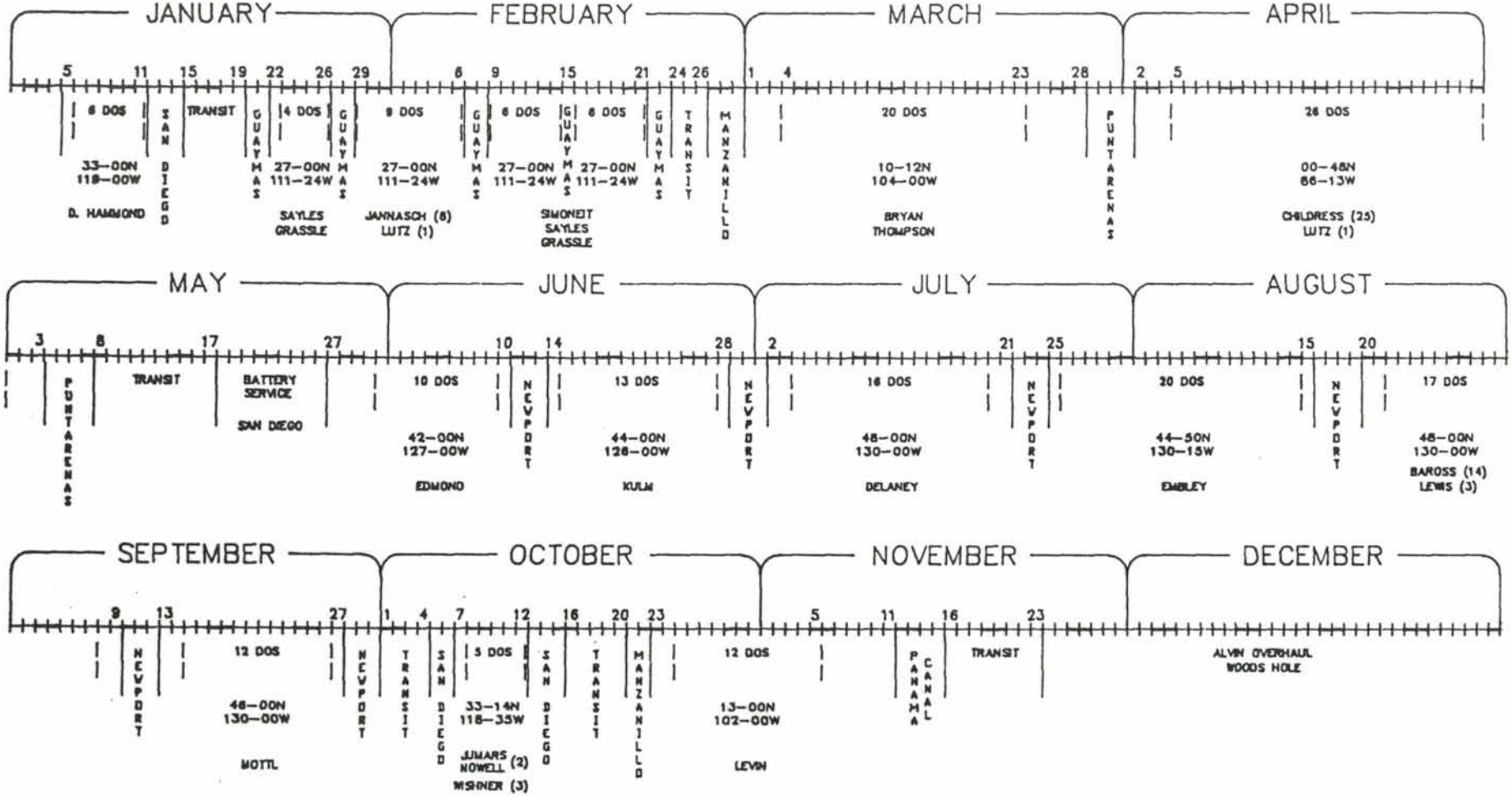


NOTE: THE INTERNATIONAL DATE LINE IS CROSSED AT THE TIMES MARKED ▼
THE DATES IN PARENTHESES ARE LOCAL.

1988

TENTATIVE *
ALVIN OPERATIONS

8 JUNE 1987



* Based upon requests for ALVIN time received by the UNOLS ALVIN REVIEW COMMITTEE and therefore subject to revisions resulting from supporting agency funding decisions.

Appendix X

UNITED STATES GOVERNMENT

memorandum

DATE: 23 APRIL 1987

FROM: Donald F. Heinrichs, US Working Group Chairman

SUBJECT: U.S.- France Mid-Atlantic Ridge Studies

TO: ALVIN Review Committee

A Statement of Intent to initiate a joint French-United States field project in the period 1990-1992 was signed in March for the bilateral agreement for Cooperation in Oceanography.

The principal target for the multidisciplinary scientific objectives will be the Mid-Atlantic Ridge. The project will integrate investigations of the structures, dynamics and composition of the deep-sea floor with studies on the circulation and dispersion of hydrothermal fluids and the related biological communities and metalliferous deposits.

American and French scientists and engineers, working within the bilateral agreement or in informal cooperation, have made significant contributions to present day understanding of the global mid-oceanic ridge system. The East Pacific Rise has been one of the principal areas of study in recent years. A new focus on comparative work in the Atlantic is seen on an important extension of the scope of these efforts and as an opportunity for integrated and comprehensive investigations.

The "Report of the Working Group" is attached which outlines the scientific framework for the work, the proposed research approach, and a project development and implementation plan. The scientific meetings, technical contacts and administrative consultations needed to assure a coordinated project will be planned together. Participation by third parties in the project may take place. A two-year coordinated field effort is planned for the period 1990 to 1992 using research ships, submersibles and the latest available technology. Approximately 2-3 months of field time per year is projected.

The Working Group has completed its task. A new joint task group will provide scientific recommendations for a multidisciplinary research program by July 1988. This task group is responsible for the publication and promotion of the Atlantic initiative to the national research communities. This includes the identification of mechanisms for interested researchers to develop and coordinate specific research projects and to exchange information concerning relevant on-going research activities. An "Atlantic workshop", under the bilateral, is planned for early 1988 to examine the critical problems to be addressed.

The U.S. chairman for the scientific task group is Dr. Steven Hammond, NOAA. The group will maintain liaison with the ALVIN Review Committee.

Donald F. Heinrichs

Attachment

Paris, 20th March 1987

REPORT OF WORKING GROUP ON JOINT FRENCH-UNITED STATES MID-ATLANTIC RIDGE SCIENCE INITIATIVE

I - RIDGE CREST STUDIES

Oceanic ridge crest systems produce most of the earth's crust. In the high energy axial zones, mass and heat from the mantle are transferred to the lithosphere, hydrosphere and biosphere. Magmatic, tectonic and volcanic activity combine to determine major characteristics of the geological structure, petrogenesis and geochemistry of the deep-sea floor. Recent discoveries reveal the importance of convective, high temperature seawater circulation through the fractured rocks of the spreading centers : the flux from hydrothermal vents contributes visibly to lithospheric cooling and affects the chemical budget of the oceans ; polymetallic sulfide deposits are formed ; unusual biological communities flourish in the highly unstable but nutrient-rich environments.

This report outlines the framework for a joint, multidisciplinary research effort by the United States and France focussed principally on the slow-spreading ridge crest system in the Atlantic ocean. A two-year coordinated field effort is planned for the period 1990 to 1992 using research ships, submersibles and the latest available technology.

Results from underway programs in both the United States (NOAA, NSF, ONR, USGS) and France (IFREMER and INSU/CNRS) provide new evidence showing that ridge crests are very dynamic provinces and highlighting important problems.

Exploration of the three-dimensional geology of young oceanic crust is one of the frontier fields of investigation : what, for example, are the rules governing variations of deep structure in space and time, how are density variations within the plates compensated and how do they relate to observed topography ? How do magma bodies behave and how are they located ? These are key questions to which firmer answers are needed for establishing more rigorous models of how spreading centers function and of how heat sources drive the hydrothermal circulation. The degree to which magmatic, tectonic and hydrothermal processes fit into a rhythmic pattern and the time constants involved is another clear target for future work.

Many other subjects for research are cardinal to a better grasp of ridge crest processes and their consequences. Some questions pertain to regional problems of geodynamics, long wave-length geochemical anomalies, or to the contribution of vent fluids and gases to the global chemical balances. Some relate to the physical properties, petrochemistry, tectonics and stability of discrete units of accretion,

the influence of fracture zones on the generation of new oceanic crust, or to the alteration of the crust as it moves off axis. Furthermore, ridge crests are one of the testing grounds for building hypotheses on the driving mechanisms of sea-floor spreading. Other questions concern the hydrogeological processes more directly : for example, to what extent and in what manner are hydrothermal cells individualized ? what is their temporal and spatial distribution ? what are their heat budgets and chemistry ? The associated polymetallic oxide and sulphide deposits occur in different contexts. What convergence of particular sets of conditions leads to their concentration and controls their extent, volume and diversity ?

The biological communities are not only a product of peculiar environmental conditions but are part of the dynamic system as a whole, and are not only of intrinsic interest but pose important questions about the physiology, origin and evolution of marine life. What, for instance, are the relationships between the hydrothermal fluids and the biological communities ? What are the controlling factors for vent biological productivity and community structure ? How do vent organisms colonize new areas ? How do vent organisms and communities evolve ? What are the physiological and biochemical adaptations to the unique chemical, high-temperature and high-pressure environments ?

It is evident that a global approach incorporating quantitative and process-oriented studies is required to advance understanding of the inter-related causes and effects of the time varying geological, chemical and biological activity associated with accretion. A major limitation is the lack of sufficient state-of-the-art observational data to test hypotheses and speculations. Integrated programs need to be carried out within carefully chosen regions. Critical gaps in information about the Atlantic area need to be closed.

The following section adds further comments towards establishing an outline of some of the questions that should be considered in the development of a scientific plan for the joint French-United States' project. The research subjects are arbitrarily grouped under six thematic headings. Aspects of the structure and processes of the Mid-Atlantic Ridge critical for comparisons with analogous systems in other oceans need to be stressed.

II - MAJOR THEMES

1. Geological Structure and Mantle Dynamics

Ridge crest segments represent samples in space of different phases of geological development in time. In detail, bathymetry and the morphology of tectonic and volcanic structures change rapidly along strike and there are quite local variations in the intensity of physical fields. However, overall, the Mid-Oceanic Ridge as a whole appears to reflect remarkably steady state growth and evolution. In general, the need is therefore both for detailed observations within the limits of

the narrow axial zones of ridge crests and for investigations at scales of the order of 100 kilometers to explore shallow and deeper structure and the mechanics and composition of the oceanic lithosphere in adjacent areas. Improved correlations of geological, physical and chemical parameters and of space-time relationships of causative geological events are realistic targets. Furthermore, it will be important to try to pursue the search for systematic and general properties for comparative purposes and with a view to improving predictive models.

There are many questions to which only partial answers are available, for example, (a) how do crustal thicknesses and internal crustal structure vary laterally with respect to fracture zones and the early phases of sea floor evolution ? (b) how are areas of normal oceanic crust confined ? (c) what are the dimensions, depth, longevity and physical and chemical properties of magma bodies and how are they located in space and time ? (d) what are the modes of migration of spreading centers and of changes in their mutual geometries ? (e) what is the importance of extension in transform faults ? (f) what are the relationships between convection, the thermo-mechanical behavior of the lithosphere and observed surface structure and bathymetry ? (g) how do instantaneous opening rates compare with average rates ? (h) what is the significance, at the scale of different wavelengths, of changes that can be discerned from geochemical studies of crust and mantle heterogeneity ? (i) what are the different states of stress in the crust ? (j) what are the effective sources of the observed magnetic anomalies and to what extent is their intensity affected by hydrothermal circulation ? (k) what is the width of the active tectonic zone and the importance of tilting and what are the causes of variations in rift morphology. These sorts of questions are relevant to all general studies of submarine hydrothermalism and of the associated deposits and to developing well-constrained objectives for future deep drilling into the Mid-Atlantic Ridge.

Surface ships and submersibles will be used for collecting ground truth data for testing hypotheses. Techniques that will be useful include seismic tomography, differential gravity observations, fine-scale magnetics, earthquake monitoring and bathymetric and structural geological mapping at various scales. In some case satellite data will be pertinent.

2. Petrological, volcanic and magmatic processes

Magmatic, volcanic and tectonic processes at spreading centers are intimately linked and control the building of the oceanic crust. The pattern of the processes in time and space and how they relate quantitatively to hydrothermal activity are fundamental questions.

In space, it will be important to identify and map limits of individual spreading units, the extent to which these units vary in length along strike and their relationship to offsets of the axis. The distribution of hydrothermal activity at this scale needs to be

established, as does the spatial distribution of volcanic and tectonic structures, including faults, individual volcanoes and flow types (for example pillow-lavas versus sheet flows and lava lakes). In addition, it is now clear that the Atlantic provides an opportunity for studying the emplacement of serpentinized peridotite bodies in the context of mantle-crust tectonics, not only in fracture zones but also in the rift valley. Detailed observations and mapping in key areas are needed to determine how general this is and to define the geodynamic settings.

In time, does the rift go through clear and repetitive tectonic and volcanic phases and does the hydrothermal activity correspond to particular stages of the process ? And how stable is the regional along-strike and across-strike geometry ? More needs to be known about the temporal behavior and persistance of magma bodies in the axial zone and about the lateral variations in time of the magma compositions, mantle heterogeneities, melting and fractionation histories of the lavas. Fine-scale studies of the mineralogy, of fresh glass compositions and of the geochemistry of the lavas are necessary to constrain better the magmatic evolution of the magma "chambers", the mantle/crust interactions and the development of hydrothermal system stockworks.

3. Heat and chemical flux

It will be important to collect and synthesize data ranging from the immediate vicinity of hydrothermal sources on the Mid-Atlantic Ridge to some considerable distance off axis.

Principal questions are (a) what is the extent and nature of hydrothermal process on the Mid-Atlantic Ridge ? and (b) what is the contribution and importance of vent fluxes to oceanic chemical balances ? These questions can be addressed, for example (a) by regional scale surveys, to discover new hydrothermal fields and to obtain knowledge about the distribution and intensity of the hydrothermal processes, and using geochemical tracers (helium, methane, manganese) and thermal anomalies and particulate (b) by physical and chemical studies of plume dispersion to obtain their dynamic three dimensional geometries as well as information about the geochemical behavior of elements concentrated in vent fluids, and their influence on the chemical budget in the Atlantic Ocean and (c) by fine-scale sampling of hydrothermal solutions from selected sites to determine their chemistries, chemical reaction processes in the vicinity of seafloor hydrothermal vents, and to define controlling factors on sulfide mineralization and on the extent of hydrothermal deposits on the Mid-Atlantic Ridge in comparison with other metalliferous fields ?

4. Hydrothermal sources and metallogenesis

Submarine concentrations of hydrothermal minerals occur wherever the necessary conditions are united for delivering hot metal-bearing fluids through the sea floor, and are therefore not limited to any specific geodynamic setting. Deposits are found, for example, in the axial zone of the Mid-Oceanic Ridge, in marginal zones of extension and on volcanic seamounts.

The metalliferous accumulations associated with ridge-crest vent fields result from complex interactions involving seawater cycled through and heated in the oceanic crust, chemical exchanges within the permeable rock section and mixing and quenching processes associated with the entry of the hot vent fluids into the water column. Sediment cover can play an important role. High- and low-temperature deposits are distinguished. Mineralization ranges from veinlets to massive accumulations. Geological, geophysical and geochemical investigations and surveys are needed to elucidate better controlling factors governing the location and extent of hydrothermal mineralization in general and sulfide deposits in particular.

Much field work still needs to be done. In the Atlantic, the principal discoveries are at present limited to the TAG area and southern Kane rift zone. Questions that need to tackled concern (a) the depth of heat sources, pore-rock ratios and the nature of fluid pathways (b) influences on the chemistry of the hydrothermal sources and on the resulting metallogenic deposits such as the residence time of circulating parcels of seawater in the crust, and the temperatures and pressures concerned (c) characterization of mineralogical variations of sulfides and other deposits with respect to different volcano-tectonic settings (d) comparison of rates of accumulation and dissolution of hydrothermally produced materials in varying environments, such as, sediment-versus non-sediment hosted localities (e) the localization of sites of entry of sea water into the fractured crust and (f) the horizontal and vertical dimensions of sulfide accumulations.

5. Evolution and Community Dynamics

Hydrothermal vent communities and other chemosynthesis-based systems present an opportunity to address scientific questions regarding the origin of life on earth and the evolution of species and communities in the marine environment. Studies of the taxonomy, morphology, and ultrastructure of Mid-Atlantic Ridge vent organisms are necessary as part of general efforts to identify common evolutionary trends and to compare different systems. Similarly, factors controlling community structure, species distribution and abundance of macrofauna in relation to hydrothermal activity need to be much better determined.

Other examples of scientific issues to be tackled include (a) estimation of growth rates, longevity and mortality of vent macrofauna to describe population dynamics (b) studies of reproductive cycles,

larval dispersal and mode of development and behavior aimed at explaining how organisms reach new vent fields and what circumstances induce settlement (c) research on genetic differentiation of vent macrofauna to define sources of population recruitment and (d) analyses of hydrothermal vent associated microbial RNA sequences and DNA/DNA hybridization to help in phylogenetic investigations.

6. Ecophysiology and Biochemistry

Studies of the physiology and biochemistry of vent organisms in relation to their microhabitats will be necessary to identify the adaptations developed for growth and reproduction in these unique environments. Research should include measurements of rates of processes of chemosynthesis and heterotrophy of micro-organisms found in vent fluids, microbial mats and symbiotic associations. Techniques using, for example, the stable isotope content of vent organism tissue could be exploited to determine carbon, nitrogen or sulfur sources and thus lead to a better understanding of energy reservoirs and food web dynamics. Metabolic characteristics of vent macrofauna can be identified through measurements of oxygen consumption rates.

Examples of other research efforts to be undertaken include (a) biochemical analyses of macrofaunal tissue and blood to determine adaptations to anaerobic and toxic environments (b) studies of the relationship between metabolic processes of vent organisms and the extent of hydrothermal mineralization (c) studies of protein (including enzyme) structure, stability and function at the ambient temperatures and pressures in various vent microenvironments to understand better adaptations to the unique conditions and (d) investigations of chemical structure of archaebacterial lipids to determine how structural features affect membrane behavior.

III - SUMMARY OF RESEARCH APPROACH

1) The project will be multi-disciplinary. It will define its specific objectives as part of a comparative approach to understanding global systems. The research will emphasize inter-relationships between geological setting and physical, chemical and biological parameters.

2) Apart from reconnaissance to help to define possible target areas the work will concern a range of temporal and spatial scales. It will include fine-scale observations of Mid-Atlantic Ridge hydrothermal sources and investigations of along-strike and across terrain (up to a few hundred kilometres and from thousands of years to 10-20 my).

3) Both surface ships and submersibles will be used. Three-dimensional mapping will be important and requirements for on-station studies will promote innovative approaches for measurements of physical fields, observations, monitoring and in-situ sampling.

IV - PROJECT DEVELOPMENT AND IMPLEMENTATION

Planning, organization and support stages that must be completed to implement the United States-French cooperative initiative include :

1) Development of a scientific overview outlining the present status of knowledge, critical problems to be solved in the next decade, and identification of new technological requirements. The Oregon "Mid-Oceanic Ridge" workshop, the COSOD II meeting and other seminars and conferences will help towards providing the elements for the basic planning document required for this initiative.

2) Publication and promotion of the Atlantic initiative to the national research communities. This will include the identification of mechanisms for interested researchers to develop and co-ordinate specific research projects and to exchange information concerning relevant on-going research activities.

3) Following an Atlantic workshop in 1988, development by a task group of an integrated geological, chemical, and biological research program including identification of field schedules and of technological and other required facilities. United States' and French research agencies will schedule ships and facilities in support of the two-year observational program.