

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

ADVISORY COUNCIL MEETING
October 21, 1985
Joseph Henry Building
National Academy of Sciences
2100 Pennsylvania Avenue NW
Washington, D.C.

Advisory Council members together with representatives of the National Science Foundation, Office of Naval Research, Minerals Management Service, U.S. Geological Survey, and Department of State met in Room 353, Joseph Henry Building. The meeting was called to order at 8:45 a.m. by Chairman Charles Miller. He presented the agenda (Appendix I).

Attendees

Advisory Council

Charles B. Miller, Chairman
Harris B. Stewart, Vice Chairman
Robertson P. Dinsmore
Carl Lorenzen
Thomas C. Malone
John Martin
Christopher N.K. Mooers
Ferris Webster, *ex-officio*

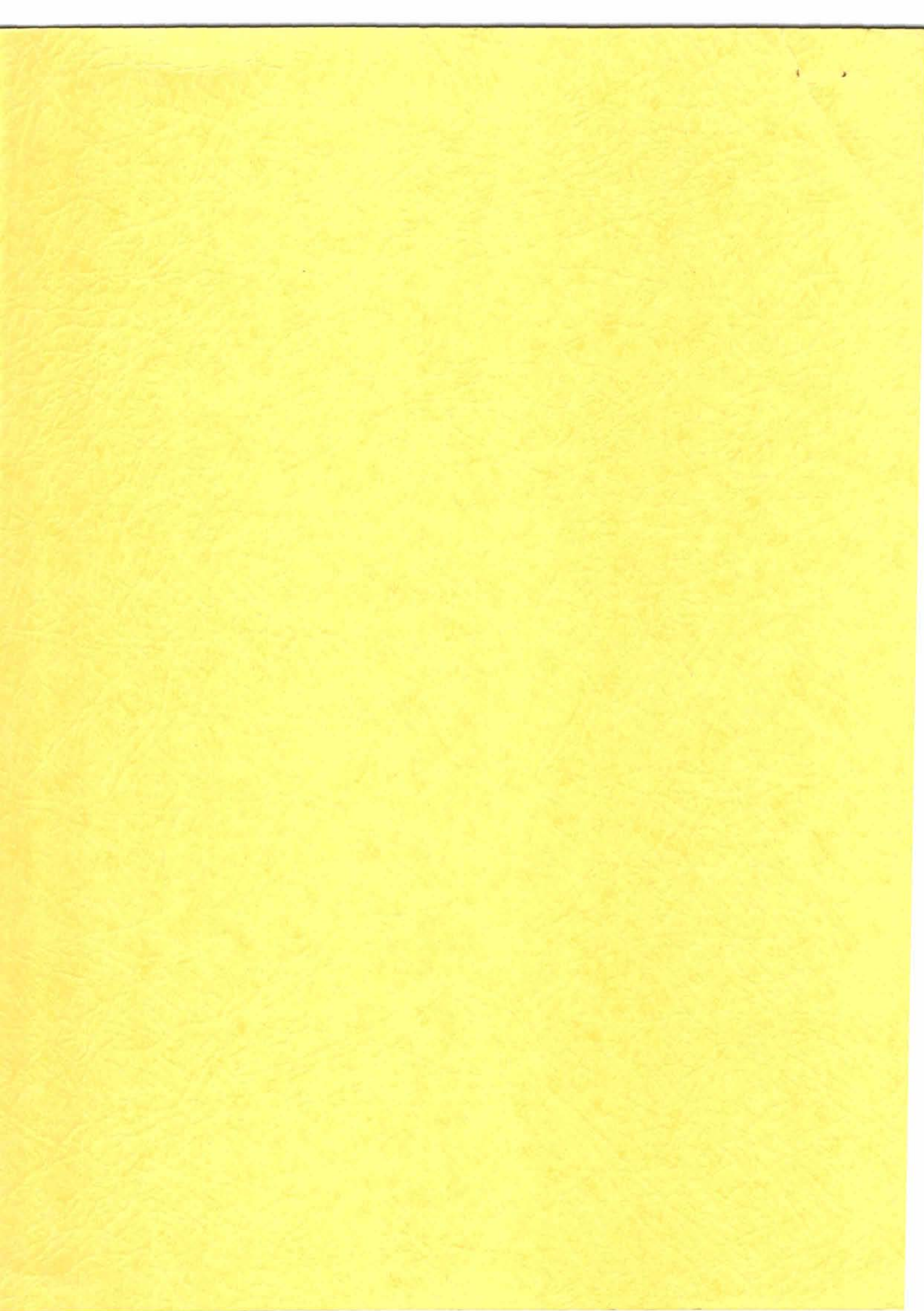
UNOLS Office

William Barbee
Mitchell Stebens

Observers

John Albright, NOAA
Larry Clark, NSF
Tom Cooley, NSF
William Erb, DOS
Grant Gross, NSF
Don Heinrich, NSF
Keith Kaulum, ONR
John McMillan, NSF
Robert Rowland, USGS
Hawley Thomas, MMS
Richard West, NSF





Minutes of the August 22, 23 meeting were not available for review.

Advisory Council Standing Roles

Scheduling Process. John Martin and Harris Stewart reported that since the special ship scheduling meeting to have been held in September (at the RVOC Meeting) was deferred, there were no new scheduling developments. Schedules for 1986 were to be addressed and problems resolved on October 22.

Expeditionary Planning. This report was deferred to the semiannual meeting of October 23.

ALVIN Review Committee. In Robert Corell's absence, William Barbee reported that the ALVIN Review Committee remains concerned with the need for a 6000 meter research submersible depth capability. For this reason, especially, the ARC will conduct workshops and help plan for academic community use of the Navy's SEA CLIFF beginning in 1987 or 1988. ARC activities both for the ALVIN program and Navy submersible programs will emphasize advanced planning.

Robert Corell will provide a more comprehensive report at the October 23 semiannual meeting.

User Assessments. Carl Lorenzen reported that returns from Ship Users Assessments remained as earlier noted: apparently biased toward favorable reports. The Council noted that such reports were not a good basis for assessing fleet efficiency. They reiterated the need to redesign cruise assessment forms and modify procedures for form submission. Carl Lorenzen and William Barbee were charged with making those modifications. Tom Malone will include notes on cruise assessments in the next UNOLS NEWS.

Vessel Inspection Process. Robertson Dinsmore reported that as the NSF ship inspection program had matured operators are becoming better prepared for inspections and the material condition of ships is improving. There are some problem areas, through, that are widespread through the fleet:

Cranes are often in less-than-satisfactory condition-some cranes are not "marinized".

Winches are sometimes not adequately maintained. Although recent NSF and ONR winch acquisition and modernization programs have wrought significant improvements, many ships do not have winches adequate for program demands. Technical advances such as motion compensation, constant tension, etc. are still not available.

Hull conditions are generally good, but wastage in tanks, especially sewage tanks is a problem. Sewage holding tanks are especially corrosive.

Ships are becoming freely available to other institution users.

Tentative efforts at inventory control are being initiated. The concept is to limit supplies, spare parts and equipment aboard to a list that is generally useful and utilized.

Captain Dinsmore noted that the inspection team could provide a general-standard list of shared use equipment for ships.

Other areas that could be improved:

Laboratories should be improved so that they are efficient work spaces.

A-frames are generally cumbersome and marginally effective.

Shipboard systems need improvement. Many sonar transducers are old and unreliable. Most meteorological sensors are poorly calibrated and outmoded.

The overall effectiveness of the fleet would be improved if the Navy's INSURV program were augmented to cover scientific equipment and instrumentation. (Keith Kaulum noted that an effort is being made to augment Navy inspection teams.)

In summary, both the inspection team and NSF sponsors believe that the program is meeting its prime objectives: to improve the material condition and effectiveness of the UNOLS fleet.

The Advisory Council recommended that the Navy's inspection process for their ships in the UNOLS fleet be augmented to include shipboard scientific equipment and instrumentation and handling equipment (e.g., cranes, frames, winches and wire).

Triennial Review of UNOLS Fleet Composition. Charles Miller reported that there had been no formal response from any UNOLS institution to the Council's *Composition, Distribution and Management of the UNOLS fleet-1985 Review*. NSF and ONR representatives had informally expressed their approval of the report and satisfaction with the Council's recommendations.

The Chairman also reported to the Council on his invited statement to the NSF Select Committee on Interlinked Ship Operations Issues. The statement, made in September, 1986, restated recent Advisory Council reviews and recommendations concerning a replacement vessel for the VELERO IV, conversion of the OSPREY, potential transfer of a ship from the University of Miami to the West Coast, the formation of a consortium of California institutions and that consortium as a ship operator.

Fleet Replacement. Robertson Dinsmore reviewed Fleet Replacement Committee activities and the status of their effort. FRC activities, as reported in Advisory Council minutes for August 22, 23, 1985 and in UNOLS NEWS, Volume 2, Number 3, September, 1985 continue: to develop science requirements for a new generation of oceanographic research vessels, to produce conceptual designs for new types of ships and to prepare a Plan for Fleet Replacement.

Since earlier reports, the Replacement Plan has been modified, essentially by incorporating specialized ships (G&G, Polar research and submersible support) into requirement for Classes I and II. The philosophy behind the modification is that Class I and II ships should all be capable of supporting a very broad variety of science. If one were to be dedicated or principally employed in any of the specialized categories, that ship's basic capabilities should be augmented for the special use (e.g., special laboratories, deployment/towing layout for a G&G ship, hull propulsion and winterizing for Polar research vessel).

Regional Fleet replacement meetings are virtually completed. The National Fleet Replacement Workshop had been deferred until January 6, 7, 1986 in Miami, Florida.

The specification of science requirements for ships remains and will remain dynamic. The National Ocean Reflection Profiling Organization (NORPO) is examining the question of community need for multichannel seismic ships and options for meeting these needs.

Shipboard Instrumentation and Technicians. John Martin had begun a poll of UNOLS ship operators concerning scientific instrumentation aboard.

UNOLS NEWS. Tom Malone noted that Volume 2, Number 3 of UNOLS NEWS had been published and distributed in September and that Volume 2, Number 4 would be published in December. Interest in UNOLS NEWS remains high.

Advisory Council Communications. Charles Miller noted that the National Science Foundation's Select Committee on Ship Operations Issues had made its recommendations to the agency. A report on NSF decisions would be made later by Don Heinrich.

The A/C Chairman had also contacted Brian Lewis, Alan Robinson, Dale Haidvogel, Catherine Gautier and Otis Brown to serve on the subcommittee on Advanced Technical Oceanographic Facilities. Brian Lewis has agreed to serve as acting chairman. He, Ferris Webster, Grant Gross and Charles Miller plan to confer this week to refine the subcommittee's objectives.

The Chairman intends to ask Joe Curray, Scripps, Jeff Fox, URI, and Vern Kulm, OSU to serve as an advisory group to work with NOAA on cooperative NOAA-UNOLS institution work in the EEZ (especially SEABEAM coverage).

UNOLS/Federal Agency Statistical Base. No new action or recommendations have been made. It was noted that the AGU has a grant to devise and analyze a manpower data base for oceanography. UNOLS may be asked to provide data.

International Restrictions to Ocean Science Committee. Harris Stewart reported that IROSC members had been advised of the Advisory Council's charge that IROSC recommend an organizational structure to aid and

foster cooperative research with foreign countries. (See Appendix III, Advisory Council minutes of August 22, 23, 1985.) IROSC has not yet met. The Council reiterated its recommendation and suggested that IROSC should meet to address this charge before the next AC meeting.

It was noted that Bill Erb's office had begun to monitor the fulfillment of post-cruise obligations in connection with foreign research. Lists of delinquent investigations had been sent to the directors of ship operating institutions and to the directors of individual investigators' research institutions. The council endorsed the effort by DOS.

The Advisory Council was briefed on the *Handbook for International Operations of U.S. Scientific Research Vessels* drafted as a UNOLS task by Lee Stevens. The Council directed that the *Handbook* be promptly published and distributed.

Federal Agency Contact. There was no activity to report.

Sponsoring Agency Information.

Don Heinrich, Head, NSF/OCFS reported on NSF issues. (Chairman Miller welcomed Dr. Heinrich to this his first Advisory Council meeting since succeeding to his position heading the Oceanographic Centers and Facilities Support Section.)

The status of the 1986 NSF budget for ship and facilities support remains the same as that reported in the August, 1985 Advisory Council minutes and in the last UNOLS NEWS: Operations, including ships other and marine technicians \$29.5 million and Acquisition and Development, including shipboard equipment, instrumentation, technology development and ship/shore constructions/conversion, \$5.9 million, for a total of \$35.4 million. NSF is virtually level funded, as is OCFS. The shortfall in funding for 1986 ship operations remains a problem. Lay-up of 1, 2, or 3 ships in 1986 remains likely. OCFS hopes to receive UNOLS recommendations on 1986 lay-ups as a result of the October 22 ship scheduling meetings.

NSF has heard the recommendations from the Ad Hoc Panel convened to consider several interlinked ship operations issues. (This panel was popularly referred to as the Select Committee.....) The three main issues considered were:

1. Ship usage at the University of Miami, relative to capabilities of the ISELIN and CAPE FLORIDA.
2. CENCAL requirements for a ship more suitable than CAYUSE.
3. Conversion of the OSPREY.

NSF decisions, reached on the basis of Select Committee recommendations and relevant factors:

1. Transfer the Cape Florida from the University of Miami to the

West Coast for operation by CENCAL in early 1986.

2. Lay-up the CAYUSE at the beginning of 1986.
3. Decline request for funding conversion of the OSPREY in 1986.
4. Decline request for funding to operate OSPREY in 1986.

OCFS shares UNOLS' and the community's concern that many decisions that would affect ship scheduling are being reached so late in 1985. One reason for this is that submission of science proposals had not always been timely. NSF has, since 1980, had a policy that gave suggested target dates for proposals requiring ship time. The proposal review panel schedule for 1986 is:

Proposal Target Date	Panel Meeting Date	Start Date (earliest)
February 1, 1986	April 1986	July 1, 1986
June 1, 1986*	August 1986	November, 1986
October 1, 1986	December 1986	February 1, 1987

*Last target date for proposals requiring ship support during calendar year 1987.

OCFS and the Ocean Sciences Division intend to enforce those target dates. While justifiable exceptions may be allowed, most ship support will be allocated and ship operations will be funded on the basis of science proposals that meet the June 1 submission target date.

OCFS will continue to look to UNOLS and the Advisory Council for advice and recommendations on ship and facilities issues. Two issues that might be anticipated:

What recommendation could be made to NSF on operational funding or inclusion in the UNOLS fleet when the University of Southern California completes conversion of the OSPREY?

After CENCAL undertakes operation of the CAPE FLORIDA, when and where should the CAYUSE be assigned?

Keith Kaulum reported on Navy and ONR activities of interest to UNOLS.

NAVOCEANO is interested in acquiring two tuna boats to be converted to coastal survey systems (e.g., equipped with swath sounding systems). This option is actively being investigated. One obstacle: the candidate ships are acoustically noisy.

The Navy continues to move on construction of a new research ship. The status is that \$37 million is included in the FY 1987 budget but is not, as had been hoped, under ONR control. Rather, NAVSEA will control the process. NAVSEA'S priority order has been: 1. SWATH, 2. monohull, and 3. conversion. Estimates are that after reserving funds to hedge against inflation and for scientific outfitting, \$22-24 million will be available to construct a ship. The NAVSEA schedule

would have RFP for final design and construction in January 1987, selection in April-July, 1987 and award in August, 1987. A possibility exists for bids from a consortium of UNOLS institutions and a shipbuilder. Selection of an operator for the ship is a problem not yet addressed.

Secretary's Initiative 14 that addresses research fleet replacements is also progressing but remains in an earlier phase.

The initiative to enhance research use and availability of Navy-operated submersibles is also progressing. Emphasis is on the SEA CLIFF (because of its 6000 meter depth capability) and TURTLE. The Alvin Review Committee will organize and conduct workshops to elicit expressions of interest in using SEA CLIFF and TURTLE in 1987 and beyond. The Navy's current plan is to acquire or charter a ship to support SEA CLIFF.

Robert Rowland reported that most USGS funds for marine investigation will be tied up in GLORIA surveys with the U.K.'s IOS. There are no plans for USGS use of UNOLS ships on the East coast in 1986. The S.P. LEE has reached Redwood City and will remain there until further notice. USGS use of the OSPREY in 1986 is yet to be determined, but would in any case be on the order of 10 days.

John Albright reported for NOAA that in 1985 20 of 23 ships were funded and operated. The hope is for level funding in 1986. Plans are to re-activate the OCEANOGRAPHER for at least part of the year.

NOAA continues to pursue contracting-out in accordance with OMB circular A-76. The study is well advanced for the Atlantic Marine Center. General terms in a preproposal bidder's conference included operation of three ships (about half of the fleet assigned to AMC). The RFP is scheduled for spring, 1986.

Hawley Thomas outlined the Minerals Management Service's program and budget for 1986. About \$26 million are available for seven studies off the 48 states, one off Alaska. More details are in Appendix II.

RVOC meeting. The RVOC met in Moss Landing and Monterey, California on September 25, 26 and 27. The highlight of the meeting was a workshop on research vessel stability organized by Gene Allmendinger. Duane Laible, Glostin Associates, Scott Davis, USCG, Bruce Adey, University of Washington and James Graf, ABS participated. Information from the workshop will be in the RVOC meeting report, in UNOLS NEWS, and in the RVOC News.

Application for Associate Membership. One application for Associate Membership had been received from ITT/Antarctic Services, Inc. (operators of the POLAR DUKE).

The Council reviewed the application (Appendix III) and concluded that ITT/Antarctic Services was not an academic or research institution in the terms of the UNOLS Charter. They recommended that ITT/Antarctic Services not be advanced for UNOLS membership. The Council was in

agreement that their role as operators of POLAR DUKE assured many common interests with UNOLS, especially concerning ship scheduling and ship availability. They directed that Antarctic Services representatives should receive UNOLS reports and be invited to UNOLS ship scheduling meetings.

Other Business. Council Members were reminded that their next meeting would be February 6 and 7, in Austin, Texas.

The spring cycle of UNOLS meetings was tentatively set for the last week in May, 1986. Subsequent to the meeting, the meetings were reset to register with other schedules:

June 2, 1986 - Advisory Council
June 3, 1986 - Ship Scheduling
June 4, 1986 - Semiannual.

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

Agenda

Advisory Council Meeting
 National Academy of Sciences
 Room 353 - Joseph Henry Bldg
 2100 Pennsylvania Avenue N.W
 Washington, D.C.
 October 21, 1985 - 8:30 a.m.

Accept minutes of August 22, 23 Meeting.

Advisory Council Standing Roles. Status of the roles.

Effective management of UNOLS fleet

Scheduling Process - Stewart, Martin
 Expeditionary Planning - Corell
 ALVIN Review Committee - Corell
 User assessment forms - Lorenzen
 Vessel inspection process - Dinsmore
 Triennial review (follow-up) - Miller (include, also, A/C statement to
 NSF Select Committee.)
 Fleet Replacement - Dinsmore
 Shipboard scientific instrumentation, technician programs and user
 manuals - Martin

Communication and Liaison

UNOLS News, v.2 n.3 - Malone
 Advisory Council communications - Miller
 UNOLS and federal agency statistical base - Webster
 International Restrictions to Ocean Science Committee - Stewart, Corell
 Acquisition and management of advanced technical facilities
 - Miller, Mooers
 Forecast of scientific and government trends, federal agency contact
 - Mooers, Maxwell, Webster

Sponsoring Agency Information - Sponsoring agency information to Advisory Council.

Don Heinrichs, Grant Gross and others, NSF
 Keith Kaulum, ONR
 Robert Rowland, USGS
 John Albright, NOAA
 Hawley Thomas, MMS
 William Erb, DOS

RVOC - Report on the September meeting - Barbee

Associate Member Applications - One application has been received
 from ITT/Antarctic Services, Inc. (Contract operators of the POLAR DUKE).

Other business.





United States Department of the Interior

MINERALS MANAGEMENT SERVICE
WASHINGTON, DC 20240

OCT 22 1985

MINERALS MANAGEMENT SERVICE (MMS) ENVIRONMENTAL STUDIES ARE AWARDED IN THE FORM OF CONTRACTS, USUALLY BY COMPETITIVE PROCUREMENT, TO PRIVATE COMPANIES OR, IN A FEW CASES, AS INTERAGENCY AGREEMENTS TO OTHER FEDERAL ORGANIZATIONS. AT THE HEADQUARTERS LEVEL, THE MMS DOES NOT COORDINATE OR DIRECT USE OF RESEARCH VESSELS FOR STUDIES. VESSELS ARE SELECTED BY EACH POTENTIAL VENDOR AND APPROVED BY THE MINERALS MANAGEMENT SERVICE. COORDINATED USE OF A GIVEN VESSEL BY MULTIPLE VENDORS MAY BE INITIATED AT THE REGIONAL LEVEL. COST SHARING FOR SHIPTIME WITH OTHER FEDERAL AGENCIES HAS ALSO OCCURRED OPPORTUNISTICALLY.

THE MINERALS MANAGEMENT SERVICE, ENVIRONMENTAL STUDIES PROGRAM'S TOTAL 1986 FISCAL YEAR FUNDING IS \$26,086,000. REGIONAL BUDGET ESTIMATES OF FUNDS ARE AS FOLLOWS: ALASKA \$10,921,000, (\$4,161,000 FOR THE REGIONAL STUDIES AND \$6,760,000 FOR THE NOAA-OCSEAF PROGRAM); ATLANTIC, \$3,576,860; GULF, \$4,060,000; PACIFIC, \$5,186,000; AND WASHINGTON (HDQ), \$2,342,140.

REGIONAL STUDIES REQUIRING USE OF RESEARCH VESSEL ARE PHYSICAL OCEANOGRAPHY AND BIOLOGICAL PROJECTS INCLUDING ENVIRONMENTAL MONITORING. SPECIFIC STUDIES, BY REGION, INCLUDE:

ALASKA

- ENVIRONMENTAL OBSERVATION OF THE ARCTIC SHELF

ATLANTIC

- IMPLEMENTATION OF PANEL RECOMMENDATION FROM THE NORTH CAROLINA MEMORANDUM OF UNDERSTANDING
- CHARACTERIZATION AND MONITORING OF BENTHIC COMMUNITIES IN AREAS OF THE CONTINENTAL SLOPE AND RISE THAT ARE SUBJECT TO OIL AND GAS OPERATIONS (NORTH, MID-, AND SOUTH ATLANTIC-YEAR 4)

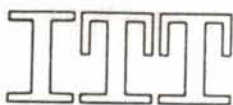
GULF OF MEXICO

- GULF OF MEXICO PHYSICAL OCEANOGRAPHY PROGRAM FY1986
- MISSISSIPPI-ALABAMA SHELF MARINE ECOSYSTEM STUDY, YEAR 2

PACIFIC

- SCCCAMP DATA ANALYSIS
- MONITORING: ASSESMENT OF LONG TERM CHANGES IN BIOLOGICAL COMMUNITIES, PHASE II, YEAR 2
- NORTHERN CALIFORNIA CIRCULATION

IF YOU HAVE ANY QUESTION ON THE REPORT PLEASE CONTACT THE ENVIRONMENTAL STUDIES BRANCH AT (202) 343-7744.

*ITT Antarctic Services, Inc.*

621 Industrial Avenue
Paramus, New Jersey 07652
Telephone: (201) 967-0123 Telex: 134458

13 September 1985

Mr. William D. Barbee
Executive Secretary
UNOLS Office, WB-15
School of Oceanography
University of Washington
Seattle, Washington, 90195

Dear Bill,

Enclosed is our application to become a member of UNOLS. Our desire to join the organization is based upon our unique position within the academic research community. Antarctic Services, Inc., is the contractor to the National Science Foundation for the operation, maintenance and logistics support of the U.S. Antarctic Research Program. As such, we operate and support all of the scientific bases in Antarctic and also operate the Antarctic Research Vessel POLAR DUKE.

The operation of R/V POLAR DUKE is specifically to provide support and an extremely versatile and capable platform for NSF/DPP funded Antarctic and Southern Ocean Science. Therefore, we operate the vessel in essentially the same manner as, and for the same purposes, as all of the other institutions within the UNOLS community. We also share the same serious concerns for safety, technological development and planning, standards of performance and availability for NSF funded scientific research.

To:

Mr. William D. Barbee

13 September 1985
Page 2.

As a member of UNOLS, we could contribute to the goals of the UNOLS' organization and better support the scientific programs associated with R/V POLAR DUKE.

Very truly yours,

Chip

Henry Kennedy,
Deputy Director,
Peninsula System

Attachment

cc: Mr. Ronald R. La Count, NSF, Washington, DC
Mr. A. F. Betzel, NSF, Washington, DC
Mr. R. A. Becker, Program Director, ANS
1392a/dc



RESEARCH SHIP
POLAR DUKE

ITT Antarctic Services, Inc.

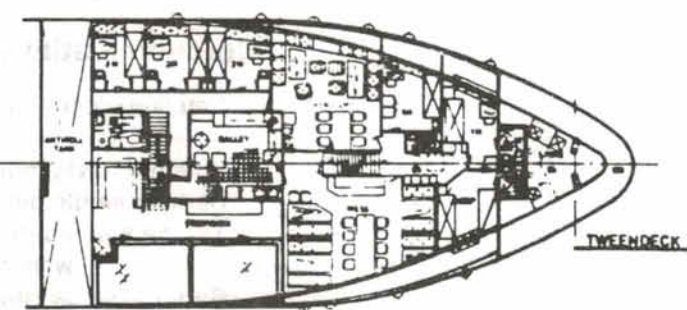
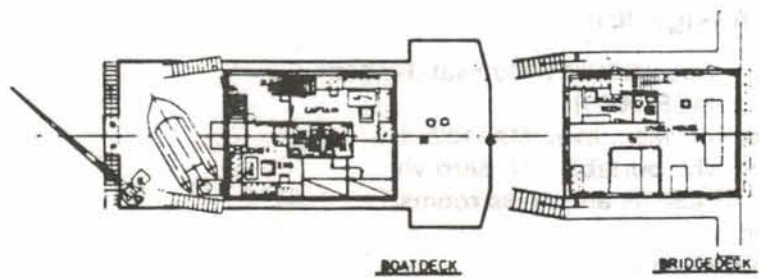
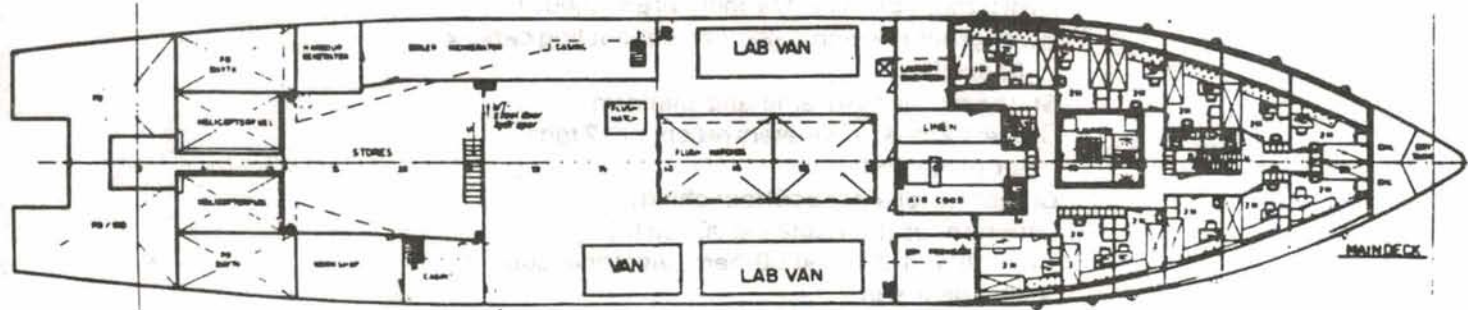
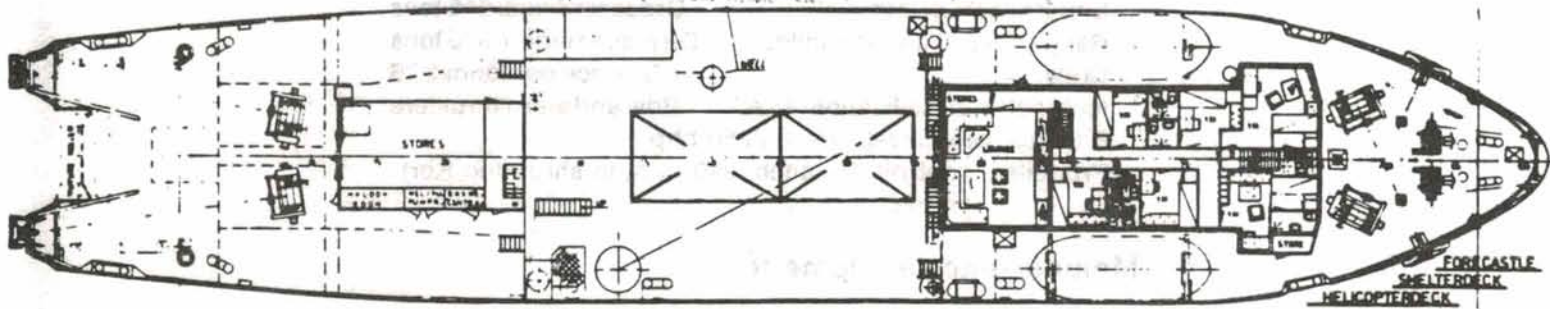
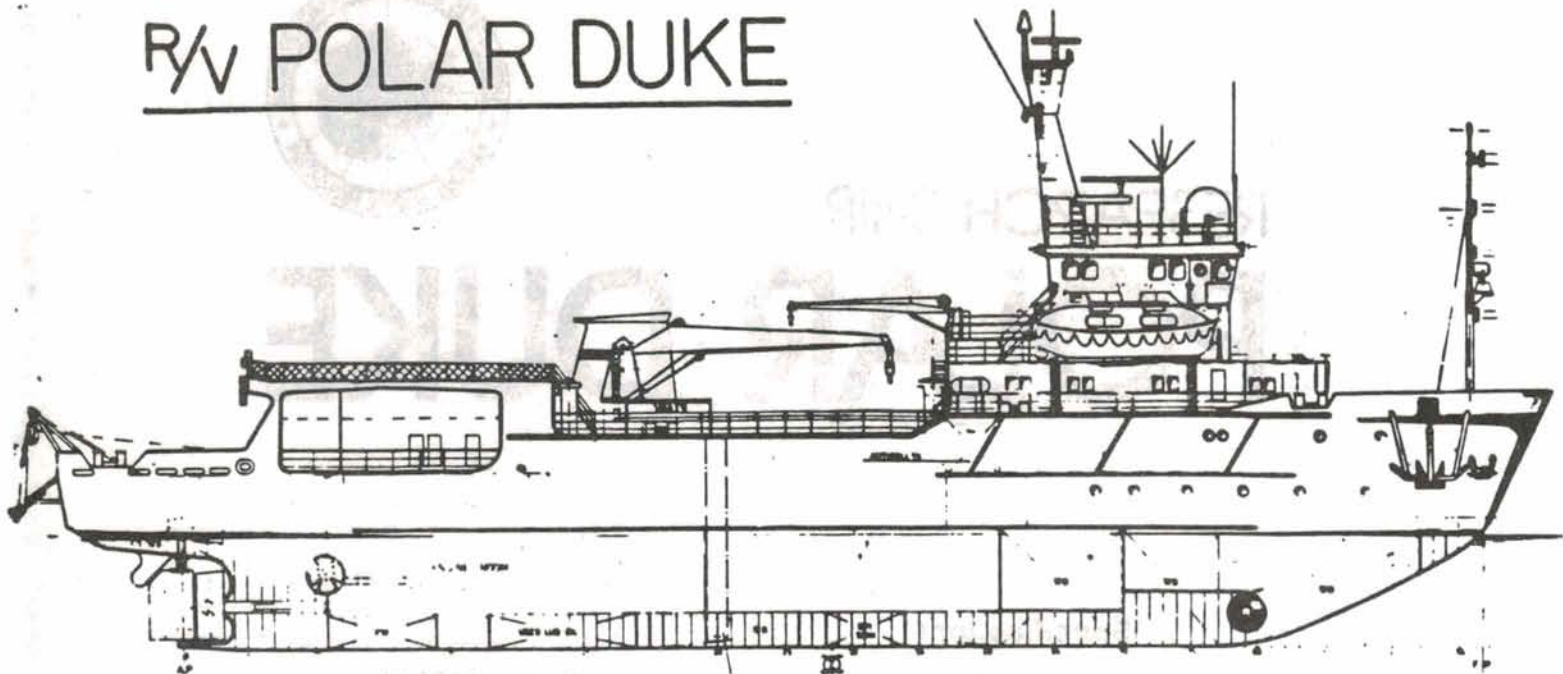
621 Industrial Avenue

Paramus, New Jersey 07652

Telephone: (201) 967-0123 Telex: 134458

Henry Kennedy
Deputy Director
Peninsula System

R/V POLAR DUKE





RESEARCH SHIP

POLAR DUKE

Specifications

Built: 1983	Length: 219 feet
Beam: 43 feet	Draft: 19 feet
Endurance: 90 days	Gross tonnage: 615 tons
Range: 25,000 nautical miles	Displacement: 1,600 tons
Crew: 14	Science personnel: 26
Icebreaker classification: 1AA	Bow and stern thrusters
Engines: two diesels, each 2250 bhp	
Propeller: controllable pitch, 240 rpm, in shrouded Kort nozzle	

Major science equipment

Deep sea trawl winch (1/2-inch wire rope x 30,000 ft) with stern A-frame for nets and towed arrays
Hydrographic winch (1/4-inch wire x 12,000 ft)
Hydrographic winch (.322-inch conducting cable x 10,000 ft)
Starboard side A-frame and platform
Crane: 22 tons (at 8 meters reach) or 12 tons (at 15 meters)
Crane: 1.5 tons (for boat launching)
Laboratories (four, totaling 900 sq ft.)
110-volt and 220-volt 60-hertz electrical supply
Scuba gear van
Holding tanks (2x3x4 ft)
Zodiacs (two) with outboard motors
Precision depth recorder

Communication and navigation

Satellite communication: Racal SES-A1 (Comsat General MCS-9000)
Satellite navigation receiver: Magnavox MX3102
Radios: single sideband, vhf, portable uhf, aero vhf
Telephone: automatic, all cabins and mess rooms, with hailing
Radar: Decca RM 916 A/C—3 cm
Decca TMS 1230C—10 cm true motion
Doppler log: Simrad NL

R/V Polar Duke Sampling Equipment

NETS AND TRAWLS

1. 3 ea. Blake trawl, 10 ft., 3 in. mesh.
2. 2 ea. Blake trawl, 5 ft.
3. 3 ea. Otter trawl, 18 ft.
4. 3 ea. IKMT, 2 meter (2 ea. frames)
5. 5 ea. IKMT, 1 meter (3 ea. frames)
6. 2 ea. Plankton, 1 meter, 571 micron.
7. 2 ea. Plankton, 1 meter, 390 micron.
8. 2 ea. Plankton, 1 meter, 243 micron.
9. 2 ea. Plankton, 1 meter, 160 micron.
10. 2 ea. Plankton, 1 meter, 75 micron.
11. 2 ea. Trawl, flat, 30 ft., 3 in. mesh.
12. 2 ea. Rock dredge, Stainless Steel.

SAMPLING BOTTLES

1. 5 ea. Niskin, 5 liter.
2. 2 ea. Niskin, 10 liter.

BOTTOM GRABS

1. 2 ea. peterson
2. 2 ea. Van Veen

IN SITU SAMPLERS

1. 1 ea. CTD, Applied microsystems inc. HP 85 computer and graphics plotter.
2. 1 ea. XBT system consisting of launcher, recorder, and T-7 Probes

MISC. EQUIPMENT

Messengers; wire clamps; wire depressor; wire weights; wire angle indicator; meter wheel, etc.

PENINSULA SCIENCE PROGRAMS
1985/1986
PALMER STATION AND R/V POLAR DUKE

- S-006 Behavioral Ecology of Euphausia superba, the Antarctic Krill
Dr. William M. Hamner
University of California, Los Angeles
- S-014 Reproduction, Feeding and Swimming Energetics, and Egg and Larval Physiology of Euphausia superba
Dr. Langdon Quetin
Dr. Robin Ross
University of California, Santa Barbara
- S-018 Predatory Feeding Ecology of Euchaeta Antarctica, a Marine Planktonic Copepod
Dr. Jeannett Yen
University of Hawaii - Manoa
- S-021 Pelagic Bird Distribution in Relation to Prey Availability and Prey Use in the Scotia Sea
Dr. George L. Hunt, Jr.
University of California, Irvine
- S-024 Physiological and Ecological Microprocessor Monitoring Studies of Free Ranging Antarctic Seals in Pack Ice Areas
Dr. Warren Zapol
Massachusetts General Hospital
- S-032 Microbial and Vertebrate Chitin Degradation in the Antarctic Environment
Dr. James T. Staley
University of Washington
- S-037 Assembly and Stability of Microtubules from Antarctic Fish at Low Temperatures
Dr. H. William Detrich, III
University of Mississippi Medical Center
- S-040 Pygoscelid Penguin Population Studies
Dr. Wayne Z. Trivelpiece
Point Reyes Bird Observatory
- S-063 Tectonic Development of West Antarctica and its Relation to East Antarctica
Dr. Ian W. D. Dalziel
Lamont-Doherty Geological Observatory

PENINSULA SCIENCE PROGRAMS
1985/1986
PALMER STATION AND R/V POLAR DUKE

(continued)

- S-207 Marine Geology - Antarctic Peninsula Continental Margin
Dr. John B. Anderson
Rice University
- S-209 Sediments Deposited by Marine-Based Ice Sheets in the Ross, Weddell, Amundsen and Barents Seas During the Last Glacial Maximum
Dr. Thomas B. Kellogg
University of Maine at Orono
- S-218 Marine Sources of Antarctic Sulfate Aerosol
Robert A. Duce
University of Rhode Island
- S-257 Geophysical Monitoring for Climatic Change
Dr. James T. Peterson
NOAA/ARL
- S-275B Air Chemistry Monitoring at Palmer Station
Dr. Dagmar Cronn
Washington State University



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R/V POLAR DUKE -- 1985/1986 SCHEDULE

20 October	Arrive Ushuaia
29 October	Depart Ushuaia
30 October	Arrive Punta Arenas
8 November	Depart Punta Arenas

CRUISE I-86 -- S-014 -- 17 DAYS

25 November	Arrive Punta Arenas
29 November	Depart Punta Arenas

CRUISE II-86 -- S-006, 014, 018 -- 50 DAYS

18 January	Arrive Punta Arenas
23 January	Depart Punta Arenas

CRUISE III-86 -- S-006, 014, 024, 032, 037 -- 50 DAYS

15 March	Arrive Punta Arenas
21 March	Depart Punta Arenas

CRUISE IV-86 -- S-006, 014, 063, 218 -- 37 DAYS

28 April	Arrive Punta Arenas
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