UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

UNOLS NEWS

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HIGHLIGHTS

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A FAREWELL TO JOHN MCMILLAN

John McMillan became the Manager, Ship Operations in the National Science Foundation's Oceanographic Centers and Facilities Support section in 1980. He came to NSF after retiring from a Naval career that began on his graduation from the United States Naval Academy in 1958. When John died in June of this year, we in UNOLS lost a valued colleague and warm friend. John was in his job in NSF when many of you became involved in UNOLS and the oceanographic fleet. Because John was good at his job, vitally concerned with the well-being of all aspects of our ocean research program, and because he was so easy to work with he seemed the very spirit of NSF's ship support. He will be missed as colleague for his wise counsel, as a friend for his warmth and wit. Fair Winds, John McMillan....Bill Barbee.

UNOLS CRUISE ASSESSMENT REPORTS

A total of 94 cruise assessment reports were filed for the period January to June, 1988. This represents 60% of UNOLS cruises during this period. Not bad, but we should do better. The most common problems encountered by PIs involved winches and cranes, CTD operation, vibration, laboratory space and condition, communications, cable and wire condition, communications, and navigation equipment.

Of the cruises for which we received reports, 88% were fully successful, 9% were partially successful, and 2% were marginally successful. Problems with weather, personnel, and scientific equipment were experienced on 19%, 23%, and 14% of cruises, respectively.

We strongly encourage principal investigators to submit cruise assessment forms. We also encourage positive as well as negative

comments. This is one important process by which UNOLS can improve its service to the scientific community.

OVERHAUL AND REFIT OF THE R/Vs KNORR AND MELVILLE

Plans to overhaul and refit KNORR and MELVILLE are proceeding on schedule. The program includes replacement of existing engines, shaft drives, and cycloidal propulsion by an integrated electric drive system with azimuthing thrusters. It further includes lengthening the hull which will provide more working space for science operations, additional berthing, and greater endurance. A 900 HP retractable bow thruster will be installed to retain the exceptional maneuverability currently enjoyed by both vessels and to provide for dynamic positioning. Laboratory space will be increased from 2,400 to 4,000 sq. ft. and scientists berths will be increased from 25 to 34. Cruising speed and range will be increased from 10 to 12 knots and from 10,000 to 12,000 miles, respectively.

Feasibility studies were carried out in 1986 and a preliminary design was completed in 1987. Contract design to produce the final design specifications is now underway. It has been proposed that the refits proceed as a two-ship program with major equipment procured jointly on a competitive award basis and with a single shipyard award. Contracts are to be awarded this fall. The yard periods are planned for November, 1988 to August, 1989 for KNORR and July, 1989 to April, 1990 for MELVILLE.

Drs. George Grice (WHOI) and George Shor (SIO) will be Co-directors of the refit program. Captain Robertson Dinsmore (WHOI) will act as Program Manager, and Captain James Williams (SIO) will be Deputy Program Manager. Review and oversight will be by a joint WHOI, SIO, and ONR committee.

CONSTRUCTION OF AGOR-23

NAVSEA has announced that Halter Marine of New Orleans will build the new AGOR (to be operated by the University of Washington) at their Moss Point, Mississippi shipyard. The delivery date will be December, 1990. AGOR-23 will be 268 ft. in length with a beam of 52.5 ft. The ship will have a cruising speed of 15 knots, an endurance of 33 days (at 15 knots), and berthing for 20 officers and crew and 30 scientists. An additional 10 berths are potentially available in deck vans (2). Total working deck and laboratory area will be 3,500 sq.ft. and 4,000 sq. ft., respectively. The breakdown of laboratory area will be as follows: 2,000 sq.ft main lab, 290 sq.ft. wet lab, 390 sq.ft. staging bay, 330 sq. ft. biochem lab, 720 sq. ft. computer lab, and 150 sq.ft. darkroom. There will be a built in climate control chamber (8 ft. x 8 ft. x 10 ft.) and a large freezer for science use. Additional laboratory space will be available in two ISO container vans (8 ft. x 8 ft. x 20 ft.). Storage space for scientific equipment and supplies include four compartments with a total area of 1875 sq.ft. and volume of 15,000 cu.ft. The ship will be equipped with four cranes (2 Allied Marine, TB-40 telescoping heavy duty lift cranes and 2 Portable Hiab "FOCO" Model 180 articulating sea cranes) and two winches (1 Markey Desh-5, 75 HP electric with 10,000 m of 1/4 inch wire rope and 1 Markey Desh-10

electric with 40,000 ft. of 9/16 wire rope). A J-frame will be located on the starboard side with an A-frame on the stern. The J-frame will be 20 ft. high with a 4 ft. inboard reach and a 6 ft. outboard reach. It will be rated for a static load of 12 tons and a dynamic load of 2 tons; the A-frame, with a vertical clearance of 25 ft. and an inboard/outboard reach of 8 ft./10 ft.

UNOLS CHARTER REVISION PROPOSED

A revision of the UNOLS Charter will be proposed at the October UNOLS meeting in Washington, D.C. An important component of the proposed new Charter involves a change in the governance structure of UNOLS. As in the current organization, the Chair and Vice Chair would be elected by the UNOLS membership. There would also be a UNOLS Council, an Executive Committee drawn from the Council, various standing committees (e.g. ship scheduling, fleet improvement, research vessel operation, and national oceanographic facilities review), and a UNOLS Office. The Chairperson, who represents UNOLS throughout the oceanographic community, calls and presides over UNOLS meetings, chairs the UNOLS Council and Executive Committee, appoints committees, and provides direction and oversight to the Executive Secretary and the UNOLS Office. The Vice Chairperson supports the Chairperson and performs the duties of the Chair in his or her absence. The UNOLS Council would function as the governing body of UNOLS. It would consist of 14 members: the Chair and Vice Chair of UNOLS who would also be the Chair and Vice Chair of the Council, two representatives from operating institutions, two representatives from non-operating institutions, three at-large representatives from any UNOLS institution, and the chairs of UNOLS standing committees (ex-officio). The Executive Committee would consist of the UNOLS Chair and Vice Chair and two elected members from the Council.

FOREIGN CLEARANCES: WHAT CAN WE LEARN FROM OTHER COUNTRIES' EXPERIENCES?

As many investigators and ship operators well know, foreign clearance problems have increased in both number and complexity. The incidence of denial of U.S. clearance requests has tripled over the last year. It is not uncommon for clearance issues to impinge significantly on cruise planning and on the ability of investigators to achieve important scientific objectives in waters claimed by coastal states.

The U.S. clearance experience is well documented, but little information is available about the effect of extended jurisdiction and recent changes in clearance procedures on the research fleets of other nations. The problems and successes encountered by other "researching states" are frequently models for subsequent clearance experiences of U.S. vessels. Consequently, improved understanding of the mechanisms used by other countries to obtain clearance, and the results they achieve, could be helpful to U.S. investigators in planning their research. A broader base of experience could also offer useful points of contact in coastal states to facilitate the clearance process. More importantly, in multinational, multi-ship programs such as the Joint Global Ocean Flux Study (JGOFS), the World Ocean Climate Experiment (WOCE), and the Ocean Drilling Program (ODP) there is likely to be a direct relationship among

clearances for ships involved in these efforts regardless of their nationality.

With the endorsement of the UNOLS Advisory Council, Lee Stevens of Joint Oceanographic Institutions in Washington, D.C. has been invited to an international meeting of ship operators to present the case for mutual sharing of clearance experiences and to discuss UNOLS concerns about clearance problems. The meeting will occur in October at the Hague, and will include representatives from the United Kingdom, France, Germany, Japan, the Netherlands, Canada, Australia, and others. Lee is the author of the UNOLS Clearance Handbook and formerly handled clearances for the U.S. Department of State. Lee will be consulting with various UNOLS institutions in preparing his presentation and would welcome comments and input. He can be reached by phone at (202) 232-3900 or by telemail at the L.STEVENS mailbox.

NEAR-TERM FLEET MANAGEMENT

An Advisory Council subcommittee on short-term fleet needs and management was formed in March. Members are R. Knox (Ch), R.Dinsmore and T. Johnson. Its charge was to take stock of the apparent mismatch between available federal funds for ship operations and the capacity of the fleet, for the three year period 1989-91. Changes to fleet composition and size due to Knorr and Melville refits, the retirement of Thompson, and the advent of AGOR-23 were to be included in the study.

The report of the subcommittee documents a bleak funding picture, with annual shortfalls in the $4-8M range, depending on year and on worst-case vs. best-case projections of both costs and federal budgets. The obvious consequence, reflected in the recommendations, is that without significant new operations funding, the fleet will be faced with the need for substantial layups and/or retirements over the next three years.

CONCEPT DESIGN FOR INTERMEDIATE, GENERAL PURPOSE SWATH RESEARCH VESSEL

The Fleet Improvement Committee has commissioned a concept design for an intermediate SWATH research vessel for general purpose oceanography. The design by SEACO Division of SAI, Inc. was guided by the **Scientific Mission Requirements** for an intermediate SWATH (see following).

SEACO has completed their concept design and presented it to the FIC in early July. The Committee saw great promise for a SWATH in the intermediate size range, and agreed to proceed toward preliminary design. (Copies and summaries of SEACO'S concept design report are available from the FIC, and comments helpful in the next design stage are solicited.

The concept design satisfies almost all characteristics specified in the Scientific Mission Requirements. Exceptions were in seakeeping, where, for some sea conditions pitch and vertical acceleration were greater than desired and concerning the need for azimuthing thrusters (versus fixed propellers for propulsion). SEACO is examining these design points.

Station-keeping:	Maintain station and work in sea state up through 5. Dynamic positioning both relative and absolute in 35 knot wind, sea state 5, and 2-knot current in depths to 6,000 m using GPS and bottom transponders; maximum excursion ± 150 ft.
Ice Strengthening:	None: not intended for work in ice.
Deck Working Area:	Spacious stern working area: 2,500 sq. ft. minimum with contiguous waist work area along one side 18 x 80 ft. minimum. Provide for itinerant (disposable) deck loading up to 1,200 lbs/sq. ft. and an aggregate total of 50 tons. One inch bolt down fittings on 2 ft. centers grid pattern to provide accommodation for portable equipment. All working decks accessible for power, water, air, and data and voice communication ports.
Centerwell:	Approximately 15' x 30' centerwell accessible from working deck and interior deck.
Cranes:	A suite of modern cranes to handle heavier and larger equipment than at present; (1) to reach working deck areas and offload vans and heavy equipment to 20,000 lbs.; (2) articulated to work close to deck and water surface; (3) to handle overside loads up to 5,000 lbs., 20 ft. from side and up to 10,000 lbs. closer to side; (4) usable as overside cable fairleads for towing at sea. Ship capable of carrying portable cranes for specialized purposes.
Winches:	Oceanographic winch systems providing fine control (0.5 m/min); constant tensioning. Wire monitoring systems with inputs to laboratory panels and shipboard recording systems. Local and remote controls. Permanently installed general purpose winches include: - Two hydrographic-type winches capable of handling 30,000 ft. of wire rope or electromechanical cable having diameters from 3/8" to 1/4". - A winch complex capable of handling 30,000 ft. of 1/2" wire/ synthetic fiber rope; or 30,000 ft. of 0.68" electromechanical cable (up to 10 KVA power transmission) of fiberoptics cable. This is envisioned as one winch with multiple storage drums which could be interchanged. Additional special purpose winches may be installed temporarily at various locations along working decks. Winch sizes may range up to 20 tons (120 sq. ft.) and have power demands to 150 h.p. Winch control station(s) located for optimum operator visibility with reliable communications to laboratories and ship control stations.

Scientific Mission Requirements for Intermediate Size General Purpose Oceanographic Research Ship "Small Waterplane Area Twin Hull (SWATH) Type"

General: The ship is to serve as an intermediate size, general research ship. The overriding required characteristic is that the ship provide the most stable environment possible in order to allow both overside and laboratory work to proceed in greater capacity and in higher sea states than is now possible. Other general requirements are for large scientific parties and greater flexibility in use of laboratory/deck spaces than is now available aboard intermediate size ships.

Size: It is intended that this SWATH ship have a general capability equivalent to an existing monohull research vessel of between 180-200 ft. LOA. Available information indicates that such a SWATH vessel would be approximately 150 ft. LOA and about 800 tons displacement.

The ship should have, or be capable of deballasting to, a harbor draft of not more than 16 ft.

Endurance: Thirty days; providing the ability to transit 15 days at cruising speed and 15 days station work (see stationkeeping and towing); 6,000 mile total range.

Accommodations: Twenty scientific personnel in two-person staterooms. Expandable to 24 through the use of van(s). Science Library-Lounge with conference room capability. 10-12 crew persons.

Speed: 12 knots cruising sustainable through sea state 4. Maximum speed 14 knots. Speed control ± 0.1 knot in 0-6 knot range; and ± 0.2 knot in range 6-14 knots.

Seakeeping: Maintain science operations in following speeds and sea states:

12 knots cruising through sea state 4
10 knots cruising through sea state 5
6 knots cruising through sea state 6

To provide exceptionally stable seakeeping capabilities. Design targets for at rest condition in the following sea states are:

	Sea State (Sig. Wave Height)	
	SS-4 (6.9 ft.)	SS-5 (12 ft.)
Pitch (ampl)	3.0 degrees	4.0 degrees
Roll (ampl)	3.5 degrees	4.5 degrees
Heave (ampl)	2.2 ft.	4.0 ft.
Vert. Accel.	0.06 g	0.09 g
Horiz. Accel.	0.06 g	0.11 g

Overside Handling: Various frames and other handling gear to accommodate wire, cable and free-launched arrays. Maximum hoist capacity 30,000 lbs. Matched to work with winch and crane locations but able to be relocated as necessary.

Stern A-frame to have 15-ft. minimum horizontal 25-ft. vertical clearance, 12-ft. inboard and outboard reaches.

Capability to carry additional overside handling rigs along working decks from bow to stern.

Control station(s) to give operator protection and operations monitoring and be located to provide maximum visibility of overside work.

Towing: Capable of towing large scientific packages up to 10,000 lbs. horizontal tension at 6 knots, and 25,000 lbs. at 2.5 knots.

Laboratories: Approximately 2000 sq. ft. of laboratory space including: Main lab area (1000 sq. ft.) flexible for frequent subdivision providing smaller specialized labs; Hydro lab (200 sq. ft.) and Wet lab (200 sq. ft.) both located contiguous to sampling areas; Electronics/Computer lab and associated users space (400 sq. ft.); refrigerator (100 sq. ft.), and freezer (100 sq. ft.).

Labs should be located so that none serve as general passageways. Access between labs should be convenient.

Labs to be fabricated using uncontaminated and "clean" materials and constructed to be maintained as such. Furnishings, HVAC, doors, hatches, cable runs, and fittings to be planned for maximum lab cleanliness.

Fume hood to be installed permanently in Wet Lab and have provision for temporary installation of fume hoods in Main lab.

Cabinetry shall be high grade laboratory quality including flexibility through the use of unistruts and deck boltdowns.

Heating, ventilation, and air conditioning (HVAC) appropriate to laboratories, vans, and other science spaces being served. Laboratories shall maintain temperature of 70-75 degrees F.; 50% relative humidity and 9-11 air changes per hour. Labs to be furnished with 110V and 220V AC. Uncontaminated sea water supply to most laboratories, vans, and several key deck areas. Compressed air supply to be clean and oil free.

Vans: To carry two standardized 8' by 20' portable deck vans which may be laboratory, berthing, storage, or other specialized use. Hookup provision for power, fresh water, uncontaminated sea water, compressed air, drains, communications, data and shipboard monitoring systems. Vans should have direct access to ship interior but located in wave sheltered spaces.

Workboats: One 17-ft. inflatable (or semi-rigid) boat located for ease of launching and recovery.

Capability to carry and deploy scientific workboat 25-30 ft. LOA, specially fitted out for supplemental operations at sea including data/sample

collecting, instrumentation, and wide angle seismic measurements. To be accommodated as one of the two-van option above.

Science Storage: Total of 5, 000 cu. ft. minimum of scientific storage accessible to labs by interior and weatherdeck hatch(es). Half to include suitable shelving, racks, and tie downs; remainder open hold. Chemical reagent storage in suitable location.

Acoustical Systems: Ship to be acoustically quiet as practical in the choice of all shipboard systems and their location and installation. Design target is underway, conventional and SEABEAM Swath echo sounding in sea state 4 and acoustical dynamic positioning through sea state 5.

Ship to have conventional 12 kHz, 3.5 kHz echo sounding systems and provision for additional systems, including:

-Phased array, multibeam Swath sonar system (SEABEAM) for guiding seafloor sampling/photography for and deep tow geophysical profiling studies; and for limited bathymetric charting;
-Acoustic Doppler current profiler; forward-looking submarine search-type sonar for mid-water trawl net guidance;
-Hull-mounted transducers appropriate for dynamic positioning using seafloor transponders;
-Transducer wells one located forward and one aft. Pressurized sea chests to be located at optimum acoustic locations for at-sea installation and servicing of transducers and transponders.

Navigation/ Communi-cations: Global Positioning System (GPS) with appropriate interfaces to data systems and ship control processors for automatic computer steering and speed control.

Dynamic Positioning Systems with both absolute and relative positioning parameters using both GPS and seafloor acoustic navigation transponders.

Internal Communi-cations: Internal communication system providing high quality voice communications throughout all science spaces and working areas.

Data transmission, monitoring, and recording system available throughout science spaces including vans and key working areas.

Closed circuit television monitoring of working areas.

Monitors for all ship control, environmental parameters, science and overside equipment performance to be available in all, or most, science spaces.

Exterior Communi-cations: Reliable voice channel for continuous communications to shore stations (including home laboratories), other ships, boats, and aircraft. This includes satellite, VHF and UHF.

Facsimile communications to transmit high speed graphics and hard copy text on regular schedules.

High speed data communications (via satellite) links to shore labs and other ships on a continuous basis.

Satellite Monitoring: Carry transponding and receiving equipment including antenna to interrogate and receive satellite readouts of environmental remote sensing data.

Ship Control: Chief requirement is maximum visibility of deck work areas during science operations and especially during deployment and retrieval of equipment. This would envision a bridge-pilot house very nearly amidships with television monitors as well as direct, unobstructed stern visibility. Portable hand-held control units could also be used at various after deck locations during overside equipment handling.

The functions, communications, and layout of the ship control station should be carefully designed to enhance the interaction of ship and science operations. For example, ship course, speed, attitude, and positioning will often be integrated with scientific operations requiring control to be exercised by computer from a laboratory or working deck area. Also a collision avoidance system should be provided to help ensure safe, remote computer-controlled operations in traffic congested waters.

MINERALS MANAGEMENT SERVICE PROSPECTING REGULATIONS FOR MINERALS OTHER THAN OIL, GAS, AND SULPHUR, 53 FEDERAL REGISTER 25242 (JULY 5, 1988)

Richard G. Bildreth, University of Oregon has provided the following summary on Minerals Management Service prospecting regulations.

Many of you have been alerted by Dave Ross that MMS has finalized its regulations for minerals prospecting. The treatment of scientific research has changed dramatically from the proposed regulations. Now permits are required for geological and geophysical scientific research where explosives are proposed for use or where a test borehole will be drilled to a depth greater than 300 feet. Otherwise, no permit is required and no notice must be given to MMS if the scientific research meets the following criteria:

1. The data and information will be made available to the public at the earliest practicable time (30 CFR 280.2);

2. The scientific research activities will not interfere with operations under any lease or right-of-way issued under the Outer Continental Shelf Lands Act (30 CFR 380.3 (c) (1));

3. The scientific research activities will not be unduly harmful to aquatic life in the area; result in pollution; create hazardous or unsafe conditions; unreasonably interfere with the other uses of the area; or disturb any site, structure, or object of historical or archaeological significance (30 CFR 280.3 (c) (2));

4. The person conducting the scientific research activities or operating the vessel from which the research is to be conducted has consulted and coordinated the activities with any other users of the area (30 CFR 280.3 (c) (3)).

Thus the final regulations only require that two actions be taken by scientific researchers not using explosives or drilling boreholes deeper than 300 feet: First, a prospective obligation to consult and coordinate with other ocean users in the area such as fishermen and commercial navigators which obligation may be delegated to the research vessel operator; and, second, an obligation to disseminate data and information produced by the research to the public at the earliest practicable time. Researchers obviously will want to document their consultation and coordination actions with other users and their data and information dissemination activities in order to be able to demonstrate compliance if questioned. The remaining obligations may be satisfied by avoiding the prohibited interferences, harms, and disturbances listed in items (2) and (3) above.

The regulations which are effective August 4, 1988 define the scientific research which is exempt from any permit requirement as "any investigation conducted in OCS for scientific research purposes which involves the gathering and analysis of G&G data and information which are made available to the public for inspection and reproduction at the earliest practicable time" and which does not include "research related

to oil, gas, and sulphur." (30 CFR 280.2). Scientific research not meeting the above conditions requires a permit obtained through the permit application procedure detailed in the balance of the regulations.

In sum, it appears that may of the concerns expressed by the scientific community with the proposed regulations have been answered by MMS in the final regulations which generally only require permits for scientific research involving explosives or drilling deeper than 300 feet, activities which required a permit under the previously governing regulations.

RESEARCH VESSEL WITH ICEBREAKING CAPABILITY (RVIB)

ITT/Antarctic Services is currently (July, 1988) conducting a procurement to charter a RVIB for use on a year round basis by the U.S. Antarctic Program. It is expected that the vessel will be in service to the program beginning in 1990, for a minimum of six years. Ten million dollars per year has been budgeted for this lease (in NSF/DPP).

The RVIB will be about 300 feet in length, have about 10,000 horsepower, and be able to continuously break three feet of ice at a speed of three knots. This size and capability is similar to the USCG Wind Class icebreakers.

Unlike Coast Guard ships, however, the RVIB will be designed as a research vessel. It will accommodate about 37 in the science party, and have about 3000 sq. ft. of working deck area and 4000 sq. ft. of laboratory space. A modern suite of oceanographic equipment will be provided, including swath mapping and multi-channel seismic systems.

Twelve proposals were received at Antarctic Services in November.

Five proposals were rejected as failing to meet the mandatory technical requirements specified in the RFP.

Two additional proposals were rejected when technical evaluation showed them as far below the norm of the other proposals which met the mandatory requirements.

Five proposals remain under consideration, all for new construction.

Three of the five proposals are for U.S. flag vessels. A U.S. flag vessel is operated by a U.S. crew, and is subject to inspection by the U.S. Coast Guard (USCG) and the American Bureau of Shipping (ABS). While such a ship must be built to USCG and ABS standards, it is not necessary that it be built in the United States. One of these three proposals is for a vessel actually built in the U.S.

Site visits to the bidders and shipyards have been completed. Best final offers were received June 1, offering technical as well as financial changes. These are still being evaluated.

Technically, all the proposals have been upgraded. Any of the competing designs is acceptable. Fuel consumption of each vessel will be

essentially the same. No proposal offers an advantage in terms of lower operating costs. Each shipyard is capable of completing the construction of the vessel.

Currently, action on the RVIB is centered at Capitol Hill. "Buy America" language has been inserted in the House version of the NSF Authorization Bill. This would require that the RVIB be built in a U.S. shipyard. There is no similar language in the Senate bill, and the difference will have to be resolved in conference. Restricting the construction to a U.S. yard could cause delays in the procurement, but the Foundation believes that it would not preclude acquiring the vessel.

AGENCY ESTIMATES OF FUNDS FOR SHIP OPERATIONS

NSF representatives provided a projection of 1989 funding available for ship operations at July, 1988 UNOLS Ship Scheduling and Advisory Council meetings. (See UNOLS News, Vol. 5, No. 1, May 1988 for NSF Estimates for the Ocean Sciences Division in 1989.)

Although NSF's budget request for 1989 would have resulted in $41.3 million for Oceanographic Facilities, deficit-reduction measures decreased the amount to $37.26 million. This is virtually no increase over 1988. NSF funds recently available for ship operations.

	1987	1988	1989
OFS, Ship Ops	$26.0 M	$25.8 M	$27.2 M
Ocean Drilling Program	1.5 M	1.3 M	1.2 M
	$27.5 M	$27.1 M	$28.4 M
1989 OFS funds used in 1988		3.3 M	-3.3 M
		$30.4 M	$25.1 M
1990 funds used for 1989			1.7 M
Available for 1989 Ship Ops			**$26.8 M**

The decision to use $3.3 million in FY-1989 funds to support 1988 ship operations was in response to two factors: Deficit-reduction decrease in FY-1988 funds came late (December, 1987), and both science and facilities managers felt constrained to honor commitments already made. Also, refits to KNORR and MELVILLE will have them out of service for much of 1989, and together with impending retirement of the THOMPSON will reduce fleet costs for 1989. **Even so, if requests to NSF for 1989 remain as high as recent estimates ($30.7 million) the shortfall of almost $4 million would result in several additional lay-ups.**

Larry Clark will be acting Manager, Ship Operations at least until October, pending selection of a permanent replacement in the position. Mr. Clark will be assisted by **Lisa Lynch, Facilities Support Specialist** who came to NSF/OCFS on June 27.

ONR's funding and management of ships for academic ocean research is based on their plan for 5 ships in the UNOLS fleet. In 1992 the Navy will own five UNOLS ships, MOANA WAVE, KNORR, MELVILLE, AGOR-23 and

AGOR-24. The KNORR will be modernized in 1988-1989, the MELVILLE in 1989-1990. A contract has been let for AGOR-23, which should be operational in 1991. AGOR-23 should be contracted for in 1989, to become operational in 1992. ONR is still arranging to transfer GYRE'S title to TAMU, THOMPSON will retire by November, 1988, CONRAD in 1991 and WASHINGTON in 1992.

ONR/USN CAPITALIZATION AND MODERNIZATION OF THE RESEARCH FLEET

$ MILLION

	1987	1988	1989	1990	TOTAL
New Construction	33.0			38.0	71.0
Modernization		14.8	14.7		29.5
					$100.5 M

Typical amortization of ONR investments in ship capitalization and modernization from 1984 through 1991 totals about $39 M.

Fleet operations in NOAA in 1988 remain at about the same level in 1988 as in recent years. Plans for 1989 are not yet final, but indications are for a level equal or less than in recent years.

A bill has been introduced by the Chairman, House Merchant Marine and Fisheries Committee that would extend and upgrade the NOAA Fleet. The bill, if enacted, would from 1990 to 1991 increase the NOAA fleet to 30 vessels by upgrading and extending 19 ships, replacing 4 others and constructing 7 additional.

UNOLS SHIPS IN 1989

Tentative ship schedules for 1989 were presented at the UNOLS Ship Scheduling Meeting in July, 1988.

ALPHA HELIX. Schedule projected for 219 days, Gulf of Alaska, Bering Sea, southeast Alaska, again Bering Sea and Gulf of Alaska. 77-90 days are funded.

ATLANTIS II. 268 day schedule includes JGOFS (non-ALVIN) in north Atlantic, March-July, refit for ALVIN, then ALVIN support in north Atlantic, southeast Pacific and end year in northeast Pacific. Funding sure for about 30 days.

BARNES. Regional Puget Sound schedule of 120 days. Additional time available throughout the year.

BLUE FIN. Scheduled for 92 days in coastal waters off southeast coast. About 60 percent funding from other sources.

CALANUS. Projected regional schedule of 209 days, Straits of Florida, Caribbean Island, etc. 65 days funded.

CAPE HATTERAS. Scheduled for 199 days, on shelf off southeastern U.S., Blake Outer Ridge/Plateau, Caribbean, Gulf of Mexico, Sargasso Sea, Chesapeake Bay and Bahamas. 168 days funded, 31 pending.

CAPE HENLOPEN. Scheduled for 186 days, Chesapeake Bay, Long Island/Long Island Sound and Gulf of Maine. 20 days funded, other pending.

CONRAD. Full-year schedule advanced for 240 days. One option mostly Atlantic, second mostly Pacific. Few funded projects. If BERNIER acquired, CONRAD would be taken out of service during 1989, and BERNIER carry out essentially the same schedule.

ENDEAVOR. Tight schedule of 248 days, all north Atlantic, from Azores to Greenland Sea. 202 days funded, 80% NSF sponsored.

GYRE. Schedule advanced for 199 days, 65 funded. Work mostly Gulf of Mexico, one eastern Caribbean project. Sponsorship split between NSF and Texas. (Negotiations continue with ONR to arrange title transfer to TAMU/Texas. Interim arrangements have been reached to allow TAMU to schedule and operate the ship for the short term.)

ISELIN. Scheduled 230 days, Atlantic subtropical convergence, Bahamas, Gulf of Mexico, Gulf Stream, Amazon, Windward Islands, Sargasso Sea and shelf off DELMARVA. 164 days funded. Schedule 78 percent NSF.

KNORR. In shipyard renovation through September. 100 day schedule advanced for work out of Jacksonville. All NSF-sponsored, none funded.

LAURENTIAN. 70 day schedule, April through June. 20 of 50 NSF days funded, 20 days State sponsored.

MELVILLE. Scheduled 185 days prior to July 8 entry into shipyard renovation. Work in South Atlantic (SAVE) through February, physical oceanography in northwest Atlantic re-entry experiments and benthic biology. All funded. Additional work could be accommodated in equatorial Atlantic and Florida area if shipyard entry is delayed.

MOANA WAVE. Schedule for 302 days begins with biology in Hawaiian Island, SEA MARC II projects in Line Island, Juan Fernandez Microplate, Galapagos, Caribbean Plate and Columbian Margin. Physical oceanography transect at 10N, ending year in Guam. All work would be NSF sponsored, 163 days are funded.

FRED H. MOORE. No schedule and zero sponsor costs were advanced for 1989. Presently completing maintenance and repair, and available for operations in July, 1989 although no funded projects are pending.

NEW HORIZON. Moderate schedule, 217 days, all northeast Pacific out of San Diego. Overhaul, March-May. Funding secure for 115 days. NSF share 58%.

OCEANUS. Strenuous 276 day schedule, 247 funded. Work begins in equatorial Atlantic, most of year in northwest Atlantic. All NSF-sponsored.

OSPREY. Operational in mid 1989. Hold requests for 56 days, 14 funded. Anticipate funding for about 12 days sea trials and modest scientific shakedown, all northeast Pacific.

POINT SUR. Scheduled for 202 days, all off California coast. About 150 days funded. Sponsors are NSF 42%, CNOC 42%, ONR 8%, other 8%. One double booking with WECOMA (10 days) was noted.

ROBERT G. SPROUL. Scheduled for 114 days, southern California regional. 84 days funded. NSF would sponsor 74%. Schedule traditionally enhanced by short local cruises with short lead time.

THOMAS G. THOMPSON. No schedule for 1989, zero sponsored costs. Ship would be turned back to Navy, October, 1988.

RIDGELY WARFIELD. Scheduled for 128 days, all in Chesapeake Bay. 108 days funded; all would be NSF-sponsored.

THOMAS WASHINGTON. 278 days scheduled, solid in western equatorial Pacific through May. After overhaul (May-July) several eastern Pacific (mostly EPR) options. 186 funded days. NSF sponsors 86%.

WECOMA. Solidly scheduled, 279 days. All work in northeast Pacific. 194 funded days. NSF would sponsor 80%, ONR 20%.

Additionally, NSF had indicated that WEATHERBIRD would be funded for station/regional surveys and sampling for GOFS, near Bermuda. Estimates are for more than 200 days, all sponsored by NSF.