

MSP 1974

Annual Report for the year ending August 31, 1974

Marine Science Programs  
University of Alabama, Tuscaloosa  
University of Alabama in Birmingham

## INTRODUCTION

During the reporting year, the Marine Environmental Sciences Consortium has begun to establish a recognizable presence and personality through the activities of the Program Committee and the Executive Director. This welcome event has allowed the Marine Science Programs to develop within a more limited area. It is assumed that MESC will assume the burden of general education programs in marine science throughout the state and that the interests of the University of Alabama system will be pursued within that framework.

The staff residing at the Dauphin Island Sea Lab have become the nucleus for a growing research interest within the two Alabama campuses and the state via MESC. This MESC job function has been assumed by the group as partial satisfaction for residency privileges at the Sea Lab. These interactions with other MESC researchers have increased the over-extension of the staff's energies and created some inner frustrations, but the results to date have been largely satisfying to both units and consortium-wide activities of the professional staff have served to strengthen the role of MSP within the framework.

As the most concentrated nucleus of marine science experience within the state, it is clearly the responsibility of the unit to provide information, guidance, and leadership to potential participants from the academic community, particularly the University of Alabama system.

The trend toward contract funding rather than grants, continues to influence the nature of the research pursued, and therefore the graduate educational program as well, which remains firmly within the purview of MSP. But the philosophy of the coastal unit has been of a pragmatic nature for some years and most of the graduate students recognize the ultimate value of this posture. The University budget has adequately supported the basic interests of the unit, while spin-off programs from contract work continue to provide research material which enhances intellectual development.

MSP appears to have established a viable role within the Tuscaloosa graduate program, and increased interest is evident at Birmingham. If some balance between the two is achieved during the coming year and an equal level of involvement develops at Birmingham, the professional staff will achieve a realistic maximum capacity in terms of graduate student responsibility. This would appear to be a major goal for the Program for this year.

## ORGANIZATION

The Program is headed by the Director, residing on the Tuscaloosa campus which functions as fiscal agent. The remainder of the professional staff (4 Ph.D.'s) reside at the Dauphin Island Sea Lab. The small number allows the group to function as a unit but it is nominally under the MSP Assistant Director. The Assistant Director bears immediate responsibility for activities at the coast.

Each of the resident staff share in research and the few administrative functions which are required. Table I shows the informal manner in which the unit operates at this time. It must be emphasized that the staff freely exchange time and duties as required and that this unusual, but highly effective situation should be protected as long as possible.

## PROGRAM DESCRIPTION

This unit is appropriately referred to as the Marine Science Programs, since it is basically a cluster of related, interdisciplinary efforts. There are defined goals within each area but the goals are interdependent in many areas. These characteristics must be emphasized. Each program area has one or more identifiable projects within it and one of the professional staff providing primary leadership, though all may be participants in any given project. Table I includes this concept and identifies the roles of the key personnel.

TABLE I

ORGANIZATIONAL CHART - MARINE SCIENCE PROGRAMS

Executive Committee  
C.E. Brett, Director (UAT)  
R.P. Glaze (UAB)  
E.R. Sayers (UAT)

Assistant Director  
G.F. Crozier (UAB)

Academic/Research  
Programs

Marine Ecology  
B.A. Vittor

Oceanology  
W.W. Schroeder

Marine Chemistry/Biochemistry  
G.F. Crozier

Graduate Education  
C.E. Brett

Research Support  
Programs

Vessel Operations  
W.W. Schroeder

Technical Support Shop  
G.F. Crozier

J. of Marine Science  
G.A. Rounsefell

Scientific Diving Program  
W.W. Schroeder/ G.F. Crozier

Sea Lab Facilities  
B.A. Vittor

Museum  
B.A. Vittor

## GRADUATE EDUCATION

The Director provides the leadership and contact point for this program because of his proximity to the University's academic departments and the graduate students themselves. MSP is totally dependent on these units for graduate students and recognized the obligation owed them. The departments currently involved are Biology on both campuses, Geology at UAT and Anatomy at UAB.

The coast staff have formally expressed a commitment to a program of the highest quality and the most stringent requirements. This attitude is partially reflected in Appendix I. There is a unanimous opinion that it is not in the best interests of the mediocre student to get involved in marine graduate programs. The opportunities available following graduation do not justify any other posture nor do the prerequisites for even minimal achievement in the field.

Nevertheless, the number of graduate students formally recognized as part of MSP doubled during the reporting year.

TABLE II

	1973	1974
M.S.	3	7
Ph.D.	2	3

Of these, two have completed virtually all requirements for the M.S. degree and one is nearing completion of a Ph.D. program.

One of the M.S. candidates has been accepted to a Ph.D. program at the University of British Columbia and has also been included as a principal investigator on an NSF-sponsored cruise of the R/V Alpha Helix. So far the major involvement has been from the Tuscaloosa campus.

TABLE III

	M.S.	Ph.D.
UAT	6	2
UAB	1	1

In general, the graduate students have not suffered from lack of physical support, but financial backing has been very lean and has created some strain and inhibited growth in this program since it is difficult for home departments to supply assistantships to off-campus students. Renovations of Sea Lab facilities have proceeded as fast as possible, but have delayed some research activities of students and staff.

Secondarily, the students have felt the lack of communication between the staff based at Dauphin Island and the home campuses. This potential lack of orientation presently seems to be quite adequately offset by the close relationships which necessarily develop with the resident staff.

Valuable graduate student interactions are increasing within our own group, and through the presence of other MESC graduate students at the Sea Lab and on the Aquarius. Involvement

with students, staff and facilities of other campuses has been encouraged and is proving to be quite successful. At this time we have students utilizing the library and electron microscope suite at the University of South Alabama, and a total-carbon analyzer at Tuskegee Institute.

The staff are currently dependent on graduate students for research support. That support is largely paid for by contract work, which tends to create a vicious cycle of time requirements that inhibit the graduate student's individual program development. Thus the problem is re-defined as funding-controlled.

Graduate Students/Projects:

Virginia Mancarrow (Ph.D. program-UAT) Distribution and ecology of Bimeria tunicata.

Walter Brehm (M.S./Ph.D. program-UAT) M.S.: Distribution patterns in Diopatra cuprea; Ph.D.: general area-benthic ecology, specifics undecided.

Douglas Clarke (Ph.D. program-UAB) General area - fish behavior/ecology; title undecided.

Steven Heath (M.S. program-UAT) Distribution and effects of suspended particulates.

Robert Bryan (M.S. program-UAT) Lipid Storage and Utilization in Marine Catfish.

Margaret McKay (M.S. program, Plan II-UAT) General area - invertebrate ecology.

Gary Gaston (M.S. program-UAT) Abundance and distribution of Mellita quinquesperforata.

Walter Ogburn (M.S. program-UAT) General area - Distribution of Seawater nutrients.

Don Peden (M.S.-UAT) General area - marine ecology, specifics undecided.



William Beegle (M.S.-UAB) Comparative characterization of collagen development in sharks.

At this time the facilities occupied at the Dauphin Island Sea Lab are adequate for our staff and students but there is no additional staff space and very little for students. Development of a "wet" lab by MESC will offer some relief, and this should be completed soon.

Library facilities at the Sea Lab are limited, but the MSP and MESC holdings have been catalogued and interlibrary loans plus the library at the University of South Alabama prevent the situation from being intolerable. MSP has supported the library through subscriptions and book purchases.

#### RESEARCH ACTIVITIES

##### Oceanology Program (Schroeder)

This group is largely responsible for the operation of the AECOSOS project and providing the hydrographic data to support the biological parameters which usually represent our ultimate research goal.

The immediate objective of AECOSOS is a descriptive and semiquantitative characterization of Mobile Bay and its influence on the near Continental Shelf, including Mississippi Sound. The transport dynamics of this system have been studied throughout the reporting year and have been the basis for the preparation of major proposals to Sea Grant and the Bureau of Land Management.

Data derived from AECSOS cruises are presently being incorporated into a BLM (SUSIO) study which has as its main objective the compilation and summation of historical and existing physical oceanographic data from the eastern Gulf of Mexico. This study is in support of work to develop a future MAFLA area sampling program for environmental monitoring.

Related to AECSOS, though not yet physically united, the development of a Shallow-water Current and Hydrographic Monitoring System (SCAHMS) has been supported throughout the year (and renewed) by the Manned Undersea Science and Technology (MUST) office of NOAA. This project is involved with the design and component characteristics of a water transport monitoring system. Activities are currently confined to a test site at Hydro-Lab in the Bahamas but incorporation of the SCAHMS into AECSOS is anticipated in 1975.

Though direct funding for ERTS has terminated, NASA and MSP are maintaining the data buoys in Mobile Bay and anticipate adding additional remote sensing units to the system in the coming year. NASA, through Marshall Space Flight Center, has probably provided the most significant support to MSP during the past year. This support has been financial, physical, material, and moral, and promises to expand in the near future as a result of a planning study coordinated through NESC.

Dr. Vittor and Dr. Crozier have initiated plans for studying synergistic effects of pesticides and heavy metals. Funding has been requested from EPA in conjunction with scientists from Tuskegee Institute.

Dr. Crozier and Dr. Vittor have also begun studies on the natural history of sand tilefish as part of the Scientific Diving Program with interest being shown for future funding from MUST and NMFS.

Dr. Vittor has obtained preliminary data on coral reef infaunal abundance and trophics, also as part of the Scientific Diving Program.

#### Related Projects

Though not currently considered MSP activities, there are two current projects which should be reviewed because of the role MSP plays in their future.

Dr. Tom Feary (UAB) was funded by Sea Grant through MSP guidance and supported. His objective is basically one of defining pathogen ecology in Mobile Bay. Dr. William Siler was already funded by the National Institute of Mental Health to computerize alterations in lower vertebrate behavior patterns, but funding by the Russell Foundation by MSP allowed him to extend his techniques and potential for additional funding.

It is the opinion that such projects should have some formal location within the MSP framework and a place provided for interested and involved principal investigators.

## SUPPORT ACTIVITIES

### Vessel Operations

The largest part of the MSP operational budget is devoted to this program. The vessel operation for the calendar year of 1973 is summarized in Appendix II. The operation of the Aquarius, and the operational budget as a whole, was hampered by the poor health of Mr. Schjott, but the most significant annual progress has nevertheless been achieved.

Renovations have resulted in attractive and utilitarian living quarters for both crew and scientific party. The vessel can comfortably accommodate the two crew required and nine scientists (a working optimum number). We have encountered serious problems obtaining deck hands on a cruiseonly basis and no relief is in sight.

Laboratory renovations are nearly complete and virtually all routine shipboard activities can be effectively pursued in the lab. Physical, chemical and biological missions have successfully cohabited the limited space available. This is partially a tribute to the patience and compatibility of the scientists involved.

Deck gear and facilities are fair to poor but have been adequate so far. Additional requirements are on the priority list this year. Navigational rigging added during the reporting period has brought the Aquarius up to anyone's standards and far beyond the average vessel within the "coasting trade" as defined by the Coast Guard.

The research activities of the vessels have been placed under the umbrella of the Alabama Estuarine and Continental Shelf Oceanographic Survey (AECSOS). Virtually the entire staff has participated in the AECSOS cruises, cooperating in the acquisition and correlation of the physical, chemical, and biological data. This project has been supported at various times by in-house funding, NASA, and Ameraport Corp. Future funding has been requested from Sea Grant and the Bureau of Land Management as well as the agencies mentioned above.

Unfortunately, the Aquarius still needs some hard money input before we can seriously anticipate significant support from some of these agencies. We do not have reliable gear-handling capability on the vessel nor the personnel to adequately man such gear. Some of the communications gear is outdated and a number of safety items are badly needed, ie. USCG approved life boats, work vest, flares, etc. Any expansion of the vessel's activities will require these items as well as the addition of both Loran A, and eventually Loran C, to the navigational equipment.

#### Scientific Diving Program

This program is an amorphous, difficult element to define or review. It is supported as a training unit by the Russell Foundation of Alexander City, Alabama. It supports in turn several current and projected projects (ERTS, AECSOS, SCAMMS, Artificial Reefs, Tilefish, etc.). The program presumes a significant commitment to marine science and diving as a valid

instrument to pursue that commitment. As such it is kept philosophically separate from the MESC course offering in scientific diving.

The program has acquired a significant equipment list and a fine national reputation as evidenced by a very rare site visit from the MUST office. Though small and hampered by a nation-wide "Cousteau-syndrome", the program is obviously doing well and drawing a great deal of interest.

The activities of this program during 1973 are described in detail in Appendix III.

#### Technical Support Shop

The hardware development mission of this unit has continued to be one of the most essential of the support programs. The role of the Shop has been expanded to cover the entire MESC and the salary of Mr. Oakes was transferred to MESC. Supervision remains directly under the Associate Director of MESC and careful controls are exercised on the source of Shop expenditures for project support.

The Shop is responsible for maintenance of the MSP vehicles, smaller vessels and Mr. Oakes functions as project engineer for the ERTS data buoy project.

General maintenance, upkeep and inventory control of field gear and instrumentation resides with Mr. Oakes. Responsibility for the Diving Locker is included in this program description also.

Journal of Marine Science

Dr. Rounsefell has continued the production of the Journal under MESC sponsorship and funding. The next issue is at the printer and has been long delayed, partially due to the loss of Mrs. Hudson from the MESC office staff.

Current plans for the Journal include upgrading the production quality and the numbers issued annually. Implementation of these intentions is dependent upon available funding and Dr. Rounsefell's ultimate plans following retirement at the end of the coming academic year.

In addition to the complex research program described above, and summarized in Table IV, the professional staff have acted in advisory capacities to State and Federal agencies, spoken to public groups, advised commercial fishermen, participated in professional conferences, conducted tours and generally represented the University's interest in the marine area.

The strength of the program lies in the freedom of action afforded by the Administration and the energy and interest of the staff. There is also a remarkably good personal interaction and overlap of interests, which promotes an exceptional team effort. MSP activities often directly involve personnel from other University departments, including Economics, Geochemistry, Chemical Engineering, Geography, etc.

The impact of the Sea Lab potential as a facility cannot be overrated. All professional visitors are awed by the obvious

TABLE IV

## RESEARCH ACTIVITIES

Program	Associated Projects	Principal Investigator	Associated Funding agencies
Marine Ecology	Benthic Community Structure	BAV	---
	Cryptic Reef Fauna	BAV	Russell Foundation/ MUST
	AECOSOS	BAV	Ameraport/BLM*
	MAFLA (Biology/Chemistry)	BAV	BLM (SUSIO)
	Tilefish Natural History	GFC	Russell Foundation/ NMFS*
	Artificial Reef Development	GFC	Sea Grant*
	Toxic Materials	BAV	EPA*
	Pathogen Ecology	T. Feary (UAB)	Sea Grant
	Reef Fish Behavior	W. Siler (UAB)	NIMH/Russell Foundation
	Oceanology	AECOSOS	WWS
ERTS		WWS	NASA
SCAHMS		WWS	MUST/Russell Foundation
MAFLA (Physical) Sediment Distribution		WWS CFB	BLM (SUSIO) COE
Marine Chemistry/ Biochemistry	AECOSOS	GFC	NASA (MESC)/BLM*
	Lipid Metabolic Studies	GFC	NSF

\*Projected activity/support



prospects of the physical plant. Point aux Pins never had the general appeal of the Sea Lab, but deserves more attention than it has received since the fire.

The situation is not entirely a bed of roses, as a glance at Table VI will indicate. The "team" is badly over-extended and productivity is lagging behind promotional efforts. This is hurting us at the graduate student level, and without that intellectual "muscle" the program could falter.

We are also attempting to play "catch-up" without a corresponding equipment budget. Our neighboring marine facilities have years of budgets on the shelves and floating at the dock.

The needs are obvious and universal: more manpower and money.

#### Plans

We have never had the opportunity to prepare adequate long-range plans for a complete, well-integrated academic program. Continued maximum interface with MESC faculty and facilities is obviously desirable since we have been able to trade services and facilities without cost to MSP.

#### Recommendations:

- 1) Develop flexible "staff" concept for UAB & UAT faculty, identifying with MSP other University personnel involved in marine science activities;
- 2) Open graduate committees to qualified MESC faculty;
- 3) Increase graduate fellowships within current budget;

TABLE V

## FUNDING SOURCES (1973-1974)

Agency	Funding level/type	Principal Investigator
MSP	\$ 130,000	---
Russell Foundation	10,000	GFC
Sea Grant	28,705	T. Feary
Ameraport	27,000	GFC
MUST	39,000	CEB
BLM (Biology/Chemistry)	27,300	WWS
BLM (Physical)	5,250	BAV
COE	6,300	WWS
NASA	2,200	CEB
NASA (MFSC)	3,300	BAV
NSF	in kind-maintenance of data buoy and system	WWS
	all costs of participation in major expedition	WWS
		GFC

- 4) Utilize formal campus co-chairman to handle local student problems;
- 5) Hold quarterly meetings of executive committee to review program progress;
- 6) Formalize organizational format as presented, to increase reporting efficiency;
- 7) Re-establish vessel operation personnel levels to 1972-73 level;
- 8) Avoid any decrease in overall MSP budget for 1974-75 operating period.