

**DAUPHIN ISLAND SEA LAB**



**SPECIAL REPORT**

ANNUAL REPORT

MARINE ENVIRONMENTAL SCIENCES CONSORTIUM

October 1, 1977 - September 30, 1978

Submitted By: George F. Crozier  
Executive Director

**Dauphin Island Sea Lab  
Dauphin Island , Alabama 36528**

Report No. 78-1

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Director's Preface:

The year can best be described as one of consolidation. The Consortium was the only "institution" which received no increase in funding from the legislature for this period and was still operating with a deficit developed in the formative years. I am delighted to present this report which will describe significant fiscal gains as well as some programmatic advances. The credit for achieving some financial stability go to May Tillman, Business Manager, Fred Rees' management of the physical plant and the faculty who managed one more year of high extramural support.

Our visibility was enhanced immeasurably by a variety of exercises ranging from legal negotiations with Mobil Oil on behalf of the state to a dramatic submersible exploration of the De Soto Canyon. Every year the Sea Lab becomes better recognized in the community and respected throughout marine academia.

All of these factors are perhaps best reflected in the response by the Commission on Higher Education and subsequently the legislature, in allocating the largest increase in funding to MESC for 1978-79 that we have ever had. The credit for this must go to those presidents who supported the cooperative experiment and the Executive Committee of the Board of Directors, particularly Dr. Howard M. Phillips. Dr. Phillips retired from the University of South Alabama during this year and he will be sorely missed by the MESC administrative structure. His support has been the cornerstone to our survival in times past and his sage advice and counsel still provide a very real service to our efforts.

I must not close my personal note without expressing my appreciation and respect to another retiree. Mr. George Oakes, Technical Support Supervisor, has been working with me since I came to Alabama ten years ago. I held the other end of the board and cleaned the other end of the sewer pipe as his apprentice for most of that time. No one has given more and had a greater impact on the development of marine education in this state than George Oakes. He has assisted graduate students in their research, undergraduates by building facilities where no one else could, designed and built gear for faculty all over the state and fixed my kids' bikes. He has given me more personal support, pleasure, service, laughs, aggravation, high blood pressure and advice than any man I've ever known. And if you think we're rid of him finally, you're wrong again - he can be contacted at the Point aux Pins field station.

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## I. General Structure:

The organization has continued to evolve along the lines developed a year ago (Figure 1). The most significant change has been the improved conception of the Discovery Hall Project under Dr. Judy Stout. This is an internal grouping of several educational and service exercises that are actually found in several places throughout the programmatic structure which is dictated in part by state budgeting protocol. The Discovery Hall Project consists of the Summer High School Institute (Instruction), the Secondary School Short Courses (Instruction), the Public Environmental Awareness Program (Public Service) and the College Program (Academic Support) which provides the logistical support to college-level field trips.

The position of Coordinator of the Discovery Hall Project remained vacant from October through May, while a search was underway to fill the position. During this interim period the Program was maintained piece-meal with Mr. Fred Rees and Mrs. Debbie Branstetter providing continuity for the high school program and Dr. Judy Stout coordinating the PEA Program and field trip requests. Four willing and able graduate students, Steve Dawson, John Dindo, Ross Lysinger and Steve Branstetter, are commended for their efforts throughout the year in hosting and conducting tours and field trips for the various programs. In the absence of a permanent coordinator, Mr. John Dindo, assisted by Mr. John Booker, stepped in to teach the most successful series of Spring High School Institutes to date.

A total of 1,531 people, 80 percent Alabamians, participated in the various programs. Fourteen other states were also represented (Table 1).

Mr. John Booker was selected by the search committee to be Coordinator of the Discovery Hall Project. Mr. Booker joined the staff on June 1, 1978

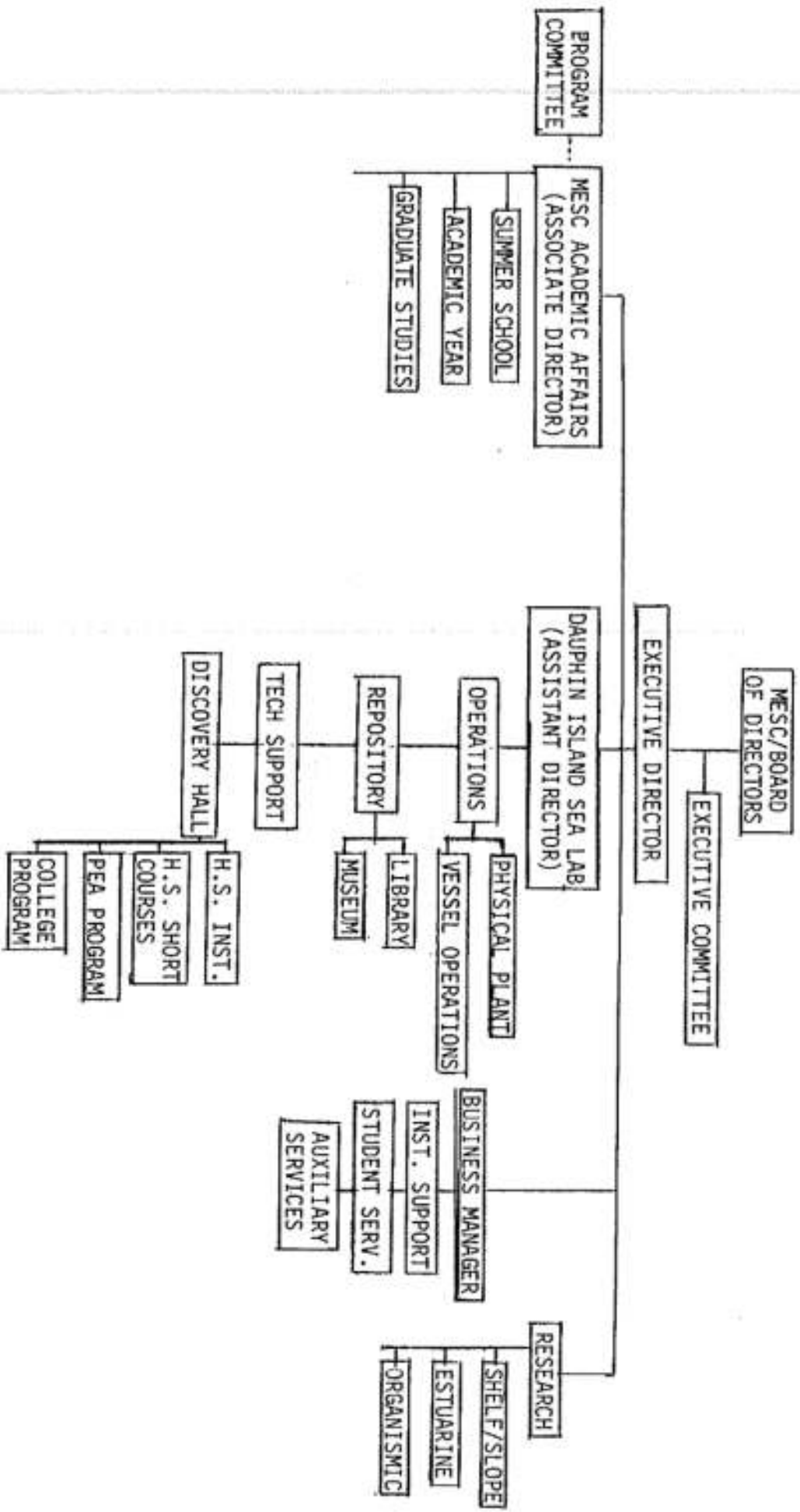


Figure 1. Organizational Structure of MESIC

TABLE 1.

DISCOVERY HALL PROJECT SUMMARY  
OCTOBER, 1977 - AUGUST, 1978

	NO. TRIPS	NO. PARTICIPANTS	*DISL FACULTY UTILIZATION (# TRIPS)								
			1	2	3	4	5	6	7	8	9
College Level (MESC)	32	318	31	8	2	8	2	6	7	8	9
College Level (Non-MESC)	9	163	8	6	4	1	0	5	1	1	0
Public Environmental Awareness (K-12)	18	501	6	2	14	3	0	2	2	0	0
PEA (Civic Organizations, Scouts, etc.)	17	285	6	3	4	0	0	3	6	6	5
Secondary School Short Courses	13	264	NA								
TOTALS	89	1,531	51	21	24	12	2	16	11	11	5
Alabama Participation Totals	72	1,229									
Alabama Participation % of TOTALS	80.8	80.2									

- \* 1 - living space
- 2 - lab space
- 3 - guided tour
- 4 - vessel
- 5 - technician
- 6 - gear
- 7 - MESC conducted program
- 8 - Faculty participation
- 9 - Meeting space



and along with Mr. Dindo, conducted the summer high school program. With completion of staffing in Discovery Hall, the total Discovery Hall concept will be implemented and developed under Mr. Booker.

The MESC membership has expanded to 19 with the addition of Talladega College. Talladega has a distinguished record in pre-professional training and should become quite a contribution to the program.

## II. Program Description:

### A. Instruction:

The 1978 academic year marked the first time in MESC history that the Dauphin Island facility was used for academic activity without interruption. This attainment is realization of a goal set at the inception of MESC, and similar activity should continue. The summer segment of these academic activities and the individual graduate student academic accomplishments are contained in separate reports. Table 2 is a summary of the remainder of 1978 academic offerings.

Summer school enrollment of 136 students for 1978 was the highest in MESC history. This was comprised of 103 undergraduate and 33 graduate students. This high enrollment resulted despite cancellation of Coastal Ornithology (due to Dr. Holliman's illness) and Marsh Ecology (low pre-summer enrollment). Classes were near equally populated, resulting in maximum efficiency and space utilization. However, an unbalanced offering with emphasis on the first summer term, resulted in some minor logistic problems regarding vessel scheduling, classroom availability and student selection of desired courses.

A summary of summer enrollment totals of recent years is as follows:

Table 2. Academic Year Summary, 1977-78

TERM:	BEGINNING:	ENDING:
Fall 1977	10/10/77	12/16/77
<u>COURSE</u>	<u>INSTITUTIONS</u>	<u>TOTAL CREDITS</u>
Marine Zoogeography	USA, UA, UAB	56
Special Topics		12
January Interim	1/09/78	1/27/78
Coastal Ecology	Huntingdon	20
Special Topics		4
Winter/Spring	1/10/78	5/30/78
Estuarine Science	USA, UA, UAB	24
Oceanology of the Gulf of Mexico		16
Special Topics (Marine Meiofauna)	AUBURN	10
Physiology of Marine Animals		12
Thesis Research		15
Research, Special Topics		3

1972 - 71	1976 - 115
1973 - 75	1977 - 109
1974 - 89	1978 - 136
1975 - 106	

Sixteen schools were represented in the 1978 summer as follows:

University of South Alabama	47
Jacksonville State University	5
Livingston State University	5
Auburn University at Montgomery	2
Troy State University	4
Birmingham Southern College	5
Spring Hill College	8
University of Alabama in Birmingham	6
University of Alabama	26
University of North Alabama	6
University of Montevallo	2
Tuskegee Institute	1
Auburn University	14
Alabama State University	2
University of Alabama in Huntsville	2
Samford University	1
	<u>136</u>

Student response was generally positive, with useful constructive criticism offered in the written faculty evaluation forum. A summary of objective faculty evaluations is found in Table 3.

Student seminars alternated with presentations by numerous guest and some resident scientists. This program of professional speakers, known as colloquium, was one of the summer academic highlights and received very favorable response from students, as promoting a very professional academic atmosphere. Colloquium topics were varied and a summary of programs presented follows:

- Dr. James Langdon - University of South Alabama - Fiddler crab behavior.
- Dr. Eric Brugginck - University of Alabama - Law Institute - Marine International Law.
- Dr. Rick Winterbottom - Royal Ontario Museum - South African Coastal Ecology.

TABLE 3. FACULTY EVALUATIONS FOR SUMMER, 1978

	Instructor knowledge	Instructor enthusiasm	Instructor interest in students	Course presentation, clear & Coherent	Exam coverage representative	Informed of progress	Lab/field exercises	Motivation in field	Recommend to others
(Stiles) Marine Biology	4.6	4.4	4.5	4.4	4.4	3.8	4.3	4.0	4.5
(Heard) Invertebrate I	4.7	4.5	4.5	3.5	4.4	4.1	4.0	3.9	4.1
(Morrill) Marine Botany									
(Schroeder) Oceanography	4.7	4.7	4.2	4.1	4.1	4.5		3.4	3.8
(Lamb) Marine Geology	4.5	4.0	4.5	3.4	4.1	4.2	4.1	3.6	3.9
(Hopkins) Marine Invertebrate II	4.8	4.4	4.4	4.1	4.4	4.1	3.3	3.9	3.5
(Shipp) Marine Vertebrate	4.6	4.4	4.3	3.8	3.4	4.2	4.0	3.9	3.9
(Ivester) Marine Ecology	3.6	2.7	3.7	3.2	3.7	4.0	3.5	3.1	2.9
(Taylor) Recent Marine Sedimentation	3.0	3.6	3.1	2.8	2.2	1.7	3.0	3.0	2.3
(Crozier) Tech Methods I	4.7	3.9	4.2	3.4	3.1	3.1	4.2	2.6	3.0
(Williams) Coastal Climatology	4.8	4.2	3.5	4.3	4.2	3.8	3.7	3.2	3.9
(Rees) Commercial Fisheries	4.3	4.0	4.3	4.0	4.5	3.8	4.8	3.8	4.5
(Feldhausen) Data Management	4.9	4.6	4.5	3.3	3.7	3.9	3.5	3.0	3.4

- Dr. Thomas Hopkins - University of Alabama (DISL) - Florida Middle Grounds  
Biology.
- Dr. Bill Kruczynski - Florida A&M University - Marsh Ecology and Reclamation.
- Dr. Robert Shipp - University of South Alabama (DISL) - Research Submersible  
in the De Soto Canyon.
- Dr. Bruce Hopper - University of Ottawa - Marine Nematodes.

The graduate studies element was proposed formally and approved by the Executive Committee as part of the 1979-80 operating budget but it has obviously always been part of our academic program and is herein reported on as such. The formal justification is found in Appendix C.

There are currently 22 graduate students actively pursuing their research, two are completed except for writing and three have defended successfully during the year. Two more students reside on campus (UA) but are pursuing marine-related theses and three new students started residence this fall. These students are reviewed in Table 4.

Through the Department of Biology at the University of Alabama and the Sea Lab over 100 inquiries have been received during the period September, 1977 to September 1978.

Declining secondary level enrollment during the summer of 1977 resulted in reduction of the summer high school institute from three four-week sessions to two four-week sessions. In addition, differential tuition charges favoring Alabama residents were instituted to encourage greater enrollment from within the state. Summer enrollment increased from 46 in 1977 to 49 in 1978, fifty-five percent from Alabama. Eleven Alabama counties were represented and eight other states (Table 5). Student ages ranged from 14 to 18, but the majority were 16 years old. Forty-five of the forty-nine students received high school science credit for the course.

TABLE 4: 1977-78 GRADUATE STUDENT SUMMARY

DEGREE	DATE ENTRANCE	TENTATIVE GRADUATION	ADVISOR	FUNDING SOURCE
Black, E. (UAB) - MS	9/76		Shoemaker/ Crozier	USF & W
Branstetter, S. (USA) - MS	6/77		Shipp	SG
Bush, D. (USA) - MS	1/78		Shipp	SG
Cunningham, K. (UA) - MS	9/76	6/79	Hopkins/ Crozier	SG
Dardeau, M. (USA) - MS	9/76	8/79	Shipp/Heard	BLM
Dawson, S. (UAB) - MS	9/76	6/79	Hopkins	COE
Dindo, J. (UAB) - MS	1/76	12/78	McGregor/ Crozier	DHP/MESC
Dowe, S. (USA) - MS	9/75		Heard	Private
Gilbert, D. (UA) - MS	9/77	9/79	Hopkins	BLM
Goeke, G. (USA) - MS	9/77		Dean	SG
Harp, C. (USA) - MS	9/76	12/78	Shipp/Ivester	SG
Hooker, A. (UA) - MS	9/77	8/79	Hopkins	BLM
Johnson, P. (UAB) - MS	1/76		Vittor	Private
Lee, C. (UA) - MS	9/75	12/78	Hopkins	MSP
Lysinger, R. (UA) - MS	6/76	5/79	Schroeder	WRRI/COE
Marley, D. (USA) - MS	9/77		Shipp	
Nance, M. (USA) - MS	9/76	12/78	Shipp	SG
Omholt, P. (UAB) - MS	9/77		Marion/ McGregor	COE
Reames, R. (USA) - MS	1/77	12/78	Heard	COE
Shipp, L. (UA) - Ph.D.	9/78		Ivester	
Stewart, J. (USA) - MS	9/76	12/78	Shipp/Heard	SG
Williams, L. (USA) - MS	9/77		Shipp	

Student and parent response was very favorable. A frequently occurring request is that an advanced, follow-up course be designed. This suggestion will be considered in the coming year. Examples of student response are presented in Appendix D.

Ten short courses in marine science were conducted for 264 middle school and high school students in the Spring, 1978. Courses varied from several days to two weeks in length with content designed to meet the needs of each group. Thirteen schools were represented, seven from Alabama and six from out-of-state (Table 6). Five students from the short courses returned to attend the summer Marine Biology Institute.

#### B. Research:

##### 1. Shelf/Slope Processes

The Bureau of Land Management (BLM) has been the federal agency charged with sale and management of the energy reserves of the Outer Continental Shelf (OCS). Personnel from the Dauphin Island Sea Lab, particularly Dr. Hopkins, have been involved for more than three years in the various baseline studies of the Mississippi-Alabama-Florida (MAFLA) OCS area. The efforts have largely been zoogeographic and community structure-oriented with the emphasis on the benthic fauna and to some extent the flora.

Dr. Shipp has been part of the team working up the demersal fish populations of MAFLA while Dr. Ivester has been responsible for the meiofaunal collections. The invertebrate epifauna and macro-algae have been collected by Dr. Hopkins.

Although extramural funding was terminated, the importance of the artificial reefs and their utility as study areas was clearly established and this project has been continued. Dr. Doug Clarke, who completed his Ph.D during the year, has been responsible for maintaining exceptional fish records on the reefs and Dr. Schroeder has generated some current data from that shelf area that

TABLE 5.

DISCOVERY HALL PROJECT  
SUMMER HIGH SCHOOL MARINE BIOLOGY INSTITUTE 1978

	TOTAL	ALA. RESIDENTS	ALA. %	NO. FOR H.S. CREDIT
First Term	22	14	64	19
Second Term	27	13	48	26
TOTALS	49	27	55	45

Alabama Counties Represented: (11)

Other States Represented: (8)

Mobile (4)  
Jefferson (13)  
Madison (2)  
Etowah  
Calhoun  
Tuscaloosa

Barbour  
Civington  
Morgan  
Walker  
Montgomery

New York  
Georgia (7)  
Louisiana (5)  
Tennessee (5)

Indiana  
Missouri  
New Mexico  
Mississippi

TABLE 6.

DISCOVERY HALL PARTICIPANT BREAKDOWN  
OCTOBER 1977 - AUGUST 1978

MESC MEMBERS - 11 (UA, UAB, UAT, AU, SCH, T1, UM USA, MC, SU, TSU)

NON-MESC ALABAMA COLLEGES - 2 (Snead State Junior College, Bishop State Junior College)

OUT OF STATE COLLEGES - 6 (U. SW LA, U. N. Colo., Miss. Gulf Coast J. Coll., TAMU,  
OK St. U., Ga. St. U.)

K-12 Schools - Representing 6 Alabama Counties (Mobile, Madison, Chactaw, Autauga,  
Jefferson, Montgomery)

Secondary School Short Courses

Alabama Schools - 7 counties (Calhoun, Dallas, Escambia, Montgomery, Jefferson)

Out of State - 6 (Ky., La., Mich., Ill.)



represents the first continuous recording made for the north-central Gulf of Mexico.

The scyllarid lobster project was funded for its second year and supplemental award of a ten day cruise with the DSRV Diaphus (submersible capable of 300' depths) was received during the summer. This resulted in the pioneer dives by Drs. Shipp and Hopkins on the head of the De Soto Canyon. Observers noted striking rock terraces split at right angles and a sizeable population of lobster in the cracks. Numerous range extensions of fish were noted and the cruise was considered tremendously productive despite a few harrowing experiences in the submersible.

## 2. Estuarine Processes

Two multiple year projects, the NASA sponsored "SPM/Turbidity study of Mobile Bay and the Inner Continental Shelf" and the Sea Grant sponsored "Hydrography of lower Mobile Bay" terminated in early 1978. Both projects were considered successful and will certainly contribute to the overall understanding of coastal Alabama. The WRRRI sponsored "Dispersion of river waters in Mobile Bay" completed field sampling in September and the results are scheduled to be published in early 1979. The interdisciplinary "Theodore Ship Channel Project", sponsored by the COE, will have the baseline phase completed in October 1978. The monitoring phase will start up in November.

The Theodore project has been one of the most productive ever pursued by the Consortium. Investigators are found not only at the Sea Lab but also at Auburn and the University of Alabama. Baseline parameters on Mobile Bay are being taken in almost every discipline and the sector involved will certainly be the best described part of the Bay system. It could conceivably serve as a model for an expanded monitoring program envisioned by the Coastal Area Board.

A complete year of oyster settling data has been collected by Mr. Chong Koo Lee under Dr. Hopkins' direction. This classic study included hydrographic data and should provide valuable information for managing the resource. This project was funded by the Sea Grant Program.

Dr. Stout was made project coordinator of the two-state, multi-institutional marsh management study sponsored by Sea Grant. She and Dr. Ivester have pursued several management techniques, fertilizers and burning, and investigated the effects and impact on the various marsh types found locally. Final reports are expected in Spring of 1979.

There is a growing interest in the occurrence, distribution and communities associated with the submerged marine meadows of our coast. The interaction between the marine and estuarine meadows is another point of interest being pursued. At the moment this program is intramural but discussions are being held with the U.S. Fish and Wildlife Service.

### 3. Organismic Processes

Most of the initiative in this area is being carried by graduate students from the University of Alabama in Birmingham. John Dindo has completed the research on his thesis dealing with seasonal cycles of hormones and blood lipids in mullet. Eric Black has completed the development of methodology oriented toward study of the transport of ions across gills of osmoregulating fish. He has been recommended for a Ph.D. program. Steve Dawson is proposing similar work but hopes to deal specifically with the function of the enzyme, Na-K ATPase.

### C. Public Service:

The role of the Consortium in this nebulous area has been one of the most rewarding over the past year. This element has to include a variety of agency and general public requests for aid, specific contract work which is not

considered research, and special activities (intramural) which seem to benefit the public as a whole. These range from civic organizations using facilities for meetings to the highly visible Public Environmental Awareness Program within the Discovery Hall Project.

The most dramatic exercise was probably the response to the problem of designing an adequate environmental scope of work for Mobil Oil's exploratory well in the mouth of Mobile Bay. This was an extremely controversial subject and the technical staff of the Alabama Water Improvement Commission called upon the expertise at the Sea Lab to help them resolve the matter. Mobil had filed suit against AWIC because of their initial refusal to grant the appropriate permit. The Attorney General's office was also involved and the situation was finally resolved by Drs. Hopkins and Crozier joining the negotiations with Mobil's legal representatives.

Virtually all of the staff responded to a contract from the Coastal Area Board which asked for the descriptive material concerning the environment of the Coastal Zone.

The Sea Lab's Meteorological Station continues to play a major public service role. Observations at Dauphin Island are made available to the public on both the "Weather Board" at the Sea Lab and on the National Weather Service radio broadcasts (VHF-FM). The station has operated for four and one-half years and all of the data through 1977 has been published in the "Physical Environment Atlas of Coastal Alabama" Schroeder 1976 & 1977. Mississippi-Alabama Sea Grant Program 76-034.

A special service that the station is always prepared to perform is the reporting of conditions during severe weather. For example, during hurricane season the Sea Lab would start to take additional observations for the National

Weather Service if any tropical disturbances were to move into the northeastern Gulf of Mexico.

In conjunction with the meteorological program Dr. Schroeder was asked to serve an additional three years on the American Meteorological Society Committee "Meteorology of the Coastal Zone".

The U.S. Fish and Wildlife Service awarded Dr. Crozier a contract which specified that graduate students would provide environmental field assessments of permit requests in the Alabama coastal zone. The students, Mike Dardeau (USA) and Eric Black (UAB), have done an outstanding job. Fish and Wildlife has judged their reports to be model efforts and have asked that they take on the adjacent county in Mississippi.

The Public Environmental Awareness Program is directed toward non-formal education of the public within the Discovery Hall concept. A series of 35 lab tours, environmental experiences, seminars, etc. were conducted at the request of groups as diverse as K-12 classes, scout groups, 4-H programs, sunday school classes, special programs for both the gifted and the disadvantaged and others. Approximately 800 individuals, most of them Alabamians, were exposed to the Dauphin Island Sea Lab, marine and coastal environments and the conflicts of man and nature in various marine/coastal settings. In terms of impact, interest generated and rewarding experiences for Sea Lab personnel, this program has been an overwhelming success.

During fiscal year 1978, Northeast Gulf Science, Volume 1, Number 2 and Volume 2, Number 1 were published. Total pagination for Volume 1 was 125. Pagination for the first issue of Volume 2 is 75. With Volume 2, Dr. Susan Ivester became Associate Editor. Dr. Robert Shipp continues as Editor.







































































