DAUPHIN ISLAND SEA LAB

SPECIAL REPORT

REPORT No. 86-87001

ANNUAL REPORT 1985-1986

Dauphin Island Sea Lab
Dauphin Island, Alabama 36528

Directors Preface:

The year which started with such promise represented by the arrival of the R/V A. E. Verrill and the hiring of two new faculty has been flawed by the impact of proration, budget reductions for next year and more proration threats. It is difficult to maintain momentum without fuel and enthusiasm. Luckily, MESC never seems to lack enthusiasm. The obstacles always seem surmountable and we enter a new year with an exciting academic program featuring new courses, new research initiatives, a functional vessel operations program, a growing graduate student population and a largely positive attitude from a successful and productive year.

New contacts have been made with the state's educational community and productive programs have evolved with the Dept. of Economic and Community Affairs. The Executive Committee has begun a more active involvement and organizational maturity is more evident than ever before. The movement toward academic achievement, which began this year, will be greatly assisted by this stability and commitment.

MARINE ENVIRONMENTAL SCIENCES CONSORTIUM

ANNUAL REPORT 1985-1986

PERSONNEL CHANGES:

Within the laboratory, Dr. Judy Stout was promoted to full Director of the Sea Lab while Mike Dardeau was promoted to Staff Biologist with primary responsibility for the scientific collections. With May Spaulding's shift to auxiliary services, Georgia Mallon has become comptroller and business manager while Lynn Bryant has assumed the duties of bursar.

Two faculty have been hired and joined the lab late in the summer. Dr. Kenneth Heck, formerly the Director of the Patrick Center for Environmental Studies at the Philadelphia Academy of Science, has accepted the permanent line item. Dr. Heck has been given a tenure-earning appointment at USA. Dr. Donald Stearns, a 1983 graduate of Duke, was chosen for the two-year post-doctoral position. Dr. Stearns is a zooplankton expert who should help us fill that data gap for the coastal ecosystem.

FACILITIES

The hurricane repairs were completed during the final week of the summer session with the delivery of furniture to Challenger Hall. A new roof design has been employed in an effort to mimimize future storm damage.

Modest alterations to the former recreation hall included new stairs and the conversion to a teaching facility will continue. The facility is designed to support the geology classes, and provide general purpose instruction. We anticipate full-time usage next summer.

COMPUTER CENTER

Computer facilities have expanded dramatically with the addition of a 30 megabyte IBM PC-AT. This unit has been custom designed to begin in-house manipulations of the enormous data base developed for Mobile Bay since 1979. Lightning damage in August partially destroyed the Televideo network and replacement will be difficult under the current budgeting constraints. Enough redundancy has been built into the system to allow normal operations to continue.

VESSEL OPERATIONS

The external renovations of the A. E. Verrill were completed in time for summer session and the vessel successfully participated in two SEAMAP cruises for the Department of Conservation and Natural Resources. The state has already contracted for a year's use of the vessel in the program. The vessel performed beautifully during summer school, meeting and exceeding all our expectations. She has also been utilized in several in-house research and graduate studies cruises.

Historically, the Rounsefell logged an average of 74 cruises per year and over 100 days at sea. With the loss of the 65' vessel in 1980 the 42' Deborah B. assumed the load averaging 90 cruises per year but only 80 days at sea, reflecting the limitation of her size and the cessation of offshore investigations.

MUSEUM

Acquistion of a Televideo TS 802-H microcomputer for museum record keeping has greatly simplified retrieval of information related to museum specimens. A series of interlocking programs entitled MESC MUSEUM INFORMATION SYSTEM or MMIS (Figure 1) written by former staff member Charlie Lutz allow staff and vistors to obtain data interactively at the

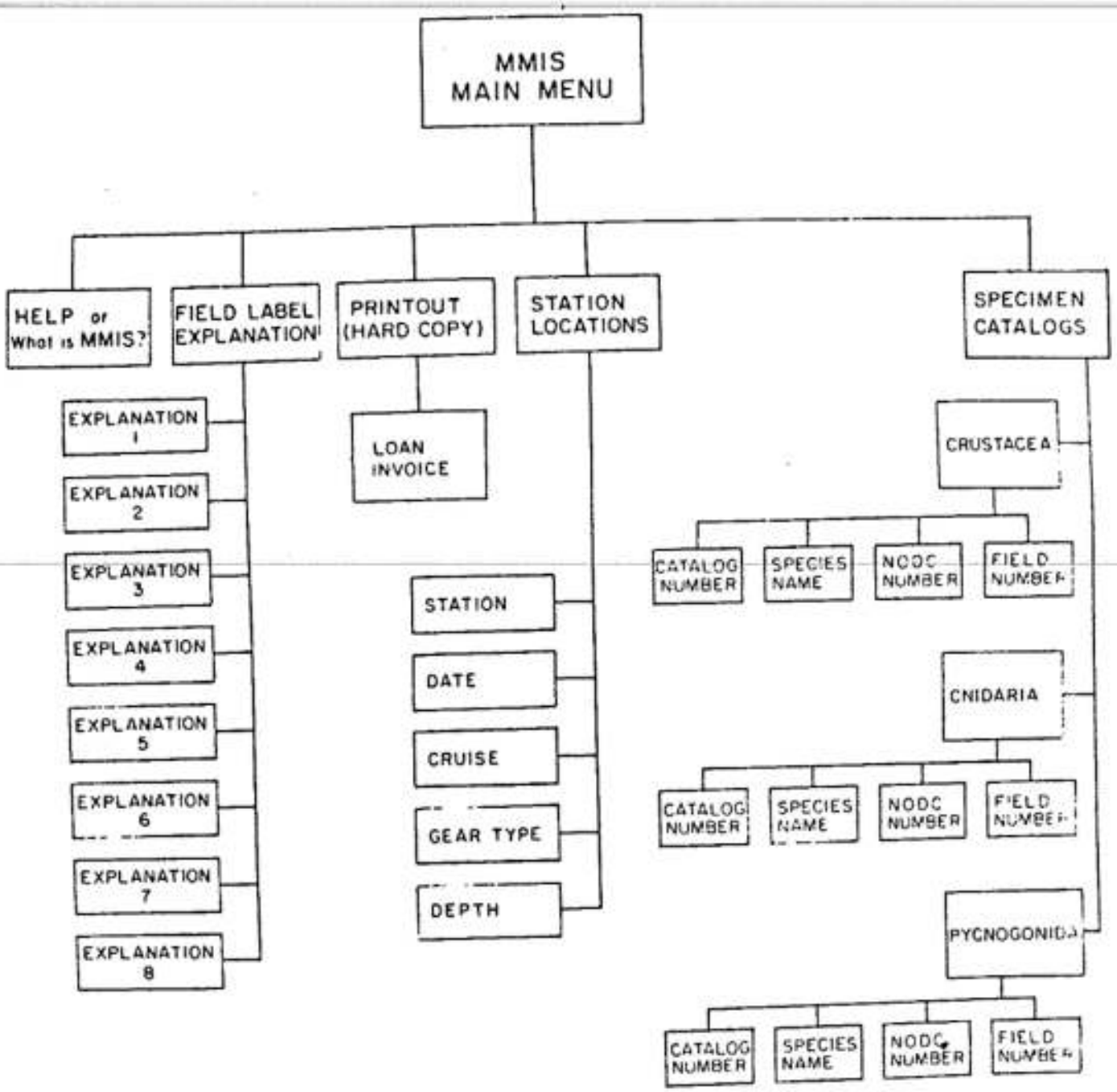
computer terminal. An example of a partial species list with associated data is shown in (Figure 2). These programs also facilitate the preparation of loan invoices (Figure 3).

Data is transferred to computer files as cataloging is completed. To date, all Cnidaria (1820 lots, 76 species, 6173 specimens), Pycnogonida (107 lots, 12 species, 228 specimens) and most Crustacea (over 10,000 lots, over 34,000 specimens) data are accessible by computer. Entry of the Mollusca data (appoximately 7,000 lots) and Echinodermata data (approximately 3000 lots) will continue in the coming year.

The museum was designated the repository for benthic invertebrates collected during the study "Benthic Macroinfauna Community Characterizations in Mississippi Sound and Adjacent Areas" sponsored by the U.S. Army Corps of Engineers. The majority of the specimens was transferred to MESC in 1983 and was followed by a voucher collection numbering over 100 species in 1984.

Twenty-five loans and gifts, totaling over 600 lots were made in 1983-86. The largest loan, 278 lots of barnacles, was made to Dr. Victor Zullo of UNCC for taxonomic and ecological research. A gift of note was the presentation of a large, preserved collection of local vertebrates and invertebrates to the Exploreum, a Mobile based science museum.

A listing of nearly 50 publications on invertebrate systematics can be found in Appendix 1. These publications are either based on material from the MESC Museum, material collected by MESC personnel, or were completed by the author while in residence at MESC.


MMIS
MAIN MENU
HELP or
What is MMIS?
FIELD LABEL
EXPLANATION
PRINTOUT
(HARD COPY)
STATION
LOCATIONS
SPECIMEN
CATALOGS
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1
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GEAR TYPE
DEPTH
CRUSTACEA
CATALOG
NUMBER
SPECIES
NAME
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FIELD
NUMBER
CNIDARIA
CATALOG
NUMBER
SPECIES
NAME
NODC
NUMBER
FIELD
NUMBER
PYCNOGONIDA
CATALOG
NUMBER
SPECIES
NAME
NODC
NUMBER
FIELD
NUMBER

NESC HUSUEN CATALOGED SPECIES DATA LISTING

CATALOG NUMBER	SPECIES NAME	NO. OF INDIV.	MALE/ FEMALE	NODC CODE NUMBER	INDEX NUMBER	FIELD NUMBER	DEPTH IN M.	COLLECTED BY	DETERMINED BY	HOST	REMARKS
AURI-3181	SQUILLA HEPTACANTHA	1	U/U	61750101	257	[illegible]	173.0	HOPKINS	DAN ADKISON		

STATION NUMBER	DATE ON STATION	CRUISE NUMBER	COLLECTION GEAR	LATITUDE DEGREES N	LONGITUDE DEGREES W	DESCRIPTION OF THE BOTTOM SUBSTRATE	MISC. COMMENTS
2427	FEB 7,1978	B-N-4	TRAWL	28 49 51"	85 54 53"	CARBONATE CLAY, LIME MUD	DEPTH RANGE 171.0 174.4 M.

CATALOG NUMBER	SPECIES NAME	NO. OF INDIV.	MALE/ FEMALE	NODC CODE NUMBER	INDEX NUMBER	FIELD NUMBER	DEPTH IN M	COLLECTED BY	DETERMINED BY	HOST	REMARKS
AURI-3182	SQUILLA HEPTACANTHA	1	U/U	61750101	8	[illegible]	173.7	HOPKINS	DAN ADKISON		HEAD ONLY

STATION NUMBER	DATE ON STATION	CRUISE NUMBER	COLLECTION GEAR	LATITUDE DEGREES N	LONGITUDE DEGREES W	DESCRIPTION OF THE BOTTOM SUBSTRATE	MISC. COMMENTS
000C	AUG 24,1977	B-N-1	DREDGE/TRAWL	27 41 23"	84 41 02"		

CATALOG NUMBER	SPECIES NAME	NO. OF INDIV.	MALE/ FEMALE	NODC CODE NUMBER	INDEX NUMBER	FIELD NUMBER DATA	COLLECTED BY	DETERMINED BY	HOST	REMARKS
AURI-3183	SQUILLA HEPTACANTHA	1	U/U	61750101	613	[illegible]	HOPKINS	DAN ADKISON		

STATION NUMBER	DATE ON STATION	CRUISE NUMBER	COLLECTION GEAR	DEPTH IN M	LATITUDE DEGREES N	LONGITUDE DEGREES W	DESCRIPTION OF THE BOTTOM SUBSTRATE	MISC. COMMENTS
4183	JULY 16,1976	BLM-4e	TRAWL	178.2	26 24 40"	84 19 50"	MUD	SAME AS 000A,1-C, DEPTH 172.0-178.2 M.

MUSEUM
Marine Environmental Sciences Consortium
P.O. Box 369-370
Dauphin Island, Alabama 36528, U.S.A.
(205) 861-2141

INVOICE OF SPECIMENS

NAME:
Dr. Mary E. Rice
Smithsonian Marine Station
Route 1, Box 194-C
Ft. Pierce, FL 33450

Invoice # 009
Date: 09/24/84
Shipping Date: 09/25/84
Preserved in: 70% ethanol
Shipped Via: USPS

This material is transmitted as a gift to your museum.

CATALOG NUMBER	SPECIMEN NAME	NO. IND.
7200-00024	SIPUNCULUS NUDUS	2

THIS LOAN CONSISTS OF 1 LOTS.

Loans are made for six (6) months and should be renewed semi-annually
Please retain the original invoice and sign and return the copy promptly

Prepared by:
Mike Dardeau

Received in good condition on _____
(date)

By _____
(name)

LIBRARY

The library has continued to grow (Table 1) and function has been maintained. Ms. Connie Mallon and Ms. Randy Horton attended a seminar on computerizing library holdings and that process has begun.

INSTRUCTION

Despite the hurricane season, the tradition of year-round instruction has been preserved. During the fall quarter Dr. Stout taught Marsh Ecology to six graduate students. She then held a readings course in Sea Grass Ecology while teaching Human Genetics for the biology department at USA, during the winter quarter. Also in the winter Dr. Shipp taught Marine Zoogeography and Dr. Crozier participated with Dr. Doug Waites in an interterm on Coastal Processes for a class from Birmingham Southern College. The spring term featured a selected topic in physiology course offered by Dr. Hopkins (8 graduate students). There was also a full seminar series arranged by Dr. Stout (Table 2).

John Dindo with part-time assistance from Dr. Crozier, Dana West and Jenny Cook, managed to host over 1,000 students from 25 schools, including field trips from the University of Alabama, Auburn University, University of South Alabama, Tuskegee University and one junior college. In addition, four in-service workshops were held for the South Alabama Regional In-Service Center at USA and a faculty development seminar conducted for the biology instructors from the junior colleges.

The summer program enrollment was down by 13% (Table 3) but was very successful in terms of productivity. Dr. Stout coordinated the student research symposium at the end and it was the best in several years (Table 4).

Table 1.

LIBRARY STATISTICS - October 1, 1985 - September 30, 1986

BOOKS:		
Total Books Accessioned	4247	
Books & Publications Processed	275	
Books & Publications Purchased	99	
Expenditures		$ 3,560.00
REPRINTS		
MESC Reprints	6280	
Reprints Processed	273	
INTERLIBRARY LOANS:		
ILL Requested	163	
Expenditures		$ 256.00
ILL Requests Received	7	
ILL Requests filled by MESC Library	7	
JOURNALS:		
Current Subscription through Faxon	80	
Expenditures		$12,041.00
Memberships		
Expenditures for Memberships		$ 402.00
Current Titles	522	
EXCHANGE PUBLICATIONS:		
Institutions agreeing to an Exchange	96	
BACK ISSUES:		
# of Issues Received	271	
Expenditures		$ 283.00
BINDING:		
# of Issues Bound	0	
Expenditures		.0
NTIS:		
# of Publications Ordered	2	
Expended from Deposit Account		$ 32.00
MEMS:		
# New Acquisitions	0	
Total Holdings	2000	
# of Requests		
# of Pages Copied		
Expenditures		

Table 2. Seminar Series

March 27	Dr. Judy Stout. Biological impacts of the application of seafood wastewater to coastal marshes.
April 3	Dr. Will Schroeder. Shelf and deepwater circulation in the Goli, including biological implications.
April 10	John Valentine. The physiological and reproductive ecology of two species of burrowing brittlestars in an estuarine habitat. A Dissertation Propectus.
April 17	Dr. Skip Lazauski. (Ala. Marine Resources Lab). Alabama's marine recreational creel survey. Methods, findings and conclusion.
April 24	Mike Lanouette. The use of remotely operated underwater vehicles with emphasis on the Dauphin Island Sea Lab's up coming unit.
May 1	Dr. Tom Hopkins. Some interactive speculation on benthic zoogeography in the Carribean Gulf of Mexico region.
May 7	Jenny Cook. Zonation of vascular plants within salt pans in marshes. A Thesis Propectus.
May 15	Fishery Research Branch, Food and Drug Administration, Dauphin Island. An overview of aquaculture research. A. Dr. Steve Plakas. Fate and disposition of tetracycline in catfish. B. Dr. Merrill McPhearson. Antibiotic resistant bacteria in catfish ponds.
May 22	Steve Heath. (Ala. Marine Resources Lab). Shrimp management in Alabama.
May 29	Mark Freeberg (National Marine Fish. Serv., Pascagoula, MS). The Fishline Information Network: An overview.

Table 3.

FIRST SUMMER SESSION 1985

INSTRUCTOR	CREDIT HOURS UNDER GRADUATE	CREDIT HOURS GRADUATE	TOTAL
Canis	24	4	28
Hopkins	40	24	64
Modlin	36	0	36
Schroeder	16	0	16
Schroeder/Lutz	34	4	38
Stout	44	0	44
Wallace	18	2	20
TOTAL	212	34	246

SECOND SUMMER SESSION 1985

INSTRUCTOR	CREDIT HOURS UNDER GRADUATE	CREDIT HOURS GRADUATE	TOTAL
Brande	16	8	24
Crozier	8	2	10
Hullman	7	28	35
Hopkins	4	2	6
Shipp	56	12	68
Stout	0	2	2
Williams	38	4	42
TOTAL	129	58	187

FIRST SUMMER SESSION 1986

INSTRUCTOR	CREDIT HOURS UNDER GRADUATE	CREDIT HOURS GRADUATE	TOTAL
Adams	2	0	2
Crozier	52	0	52
Hopkins	0	4	4
Modlin	44	20	64
Schroeder	18	17	35
Schroeder/Lanouette	30	6	36
Shipp	1	0	1
Stout	0	2	2
TOTAL	147	49	196

SECOND SUMMER SESSION 1986

INSTRUCTOR	CREDIT HOURS UNDER GRADUATE	CREDIT HOURS GRADUATE	TOTAL
Bortone	64	12	76
Crozier	0	8	8
Heck/Modlin	32	20	52
Hopkins	0	7	7
Schroeder	0	2	2
Shipp	5	0	5
Wallace	26	6	32
TOTAL	127	55	182

Table. 4 1986 Summer School Student Symposium

"Burrowing Behavior of Uca panacea with a Special Emphasis on Gravid Females"
Thomas Matthews - Master's Candidate
University of Alabama
Research Supervisor Dr. William Schroeder

"Invertebrate Organization and Identification"
Joe Mark Alls - Marine Biology Graduate
University of Alabama
Research Supervisor - Dr. Tom Hopkins

"Diurnal Variations in Fish Populations in the Surf Zone"
John A Bresnan - Biology w/concentration in Marine Science
(Undergraduate)
University of Alabama at Birmingham
Research Supervisor - Dr. Robert Shipp

"A Survey of Exposed Pleistolene Soils on the Public Beach/Casino Pier Area of Dauphin Island, Alabama."
David Nadeau - Marine Biology Major
University of South Alabama
Research Supervisor - Dr. George Lamb

"The Foreshore Classification and Calibration of a Low Energy Beach"
William Askew - MS in Foundation of Education
Troy State University
Research Advisor - Dr. George Crozier

"Influence and Analysis of Sediment in Ruppia maritima beds"
Pamela James - Graduate
University of South Alabama
Research Advisor - Dr. Judy Stout

"Sediment Plume Morphology Main Pass, Mobile, Alabama"
Randy Abston - Geology Graduate
University of Alabama
Research Advisor - Dr. William Schroeder

POSTER SESSION ONLY

"Thermal Regime Characteristics of Coastal Alabama Waters"
Michael Davis - Sea Grant Undergraduate Summer Fellowship
University of Alabama
Research Advisor - Dr. William Schroeder

Discovery Hall Program and the Environmental Studies Center co-sponsored two elementary teacher workshops and one PACE (gifted) teachers workshop this year. These workshops have been quite successful (Appendix 2). A major emphasis is on collecting specimens that the teachers will be able to use year after year and children of all ages will have a better understanding of the oceans and how it can effect them. The lab benefits from this through future utilization by these classroom teachers.

The summer program was highly successful with 26 students participating in the single four week program offered this year. Three students were scholarship winners funded through the Sea Lab and Mississippi-Alabama Sea Grant Consortium. Students came from Tennessee, Mississippi, Illinois, Massachusetts and Texas with 75% of them coming from Alabama.

A very successful faculty retreat for Mobile College was hosted by the Sea Lab, in August. Discovery Hall personnel led field trips for the 75 participants which included a collecton/observation trip aboard the A. E. Verrill.

GRADUATE STUDIES

There are 12 graduate students currently "enrolled", six at the University of Alabama, three at the University of South Alabama, two at Auburn and one at the University of Alabama at Birmingham. Six other students have expressed a strong interest in programs, 3 at the University of Alabama and 3 at USA.

Additional contributions of $6,000 each has been received from the Shell and Mobil Oil Foundations, bringing the total to $45,936 including the interest earned. At this time MESC has partially supported five graduate students without drawing on the principal of the fund. A full

fellowship has been awarded to Mr. John Valentine, a Ph.D. candidate at the University of Alabama and this fund should begin to dwindle.

It is interesting to note that MESC provided $6986, to the University of Alabama students (5), $3175 to Auburn students (1), $1718 to UAB students (1) and $1583 to USA students (2). This total represents precisely 1/3 of the total support of 9 graduate students.

RESEARCH

EXTRAMURAL:

Dr. Hopkins' study on the natural history of speckled trout was not renewed by the Alabama Research Institute so this project terminated this summer.

It has almost become dogma among fisherman and scientists that seagrass beds are the preferred habitat of all life stages of spotted seatrout. Alabama lacks the extensive seagrass meadows of other coastal states, possessing only about 1,000 acres of seagrasses in brackish and marine environments. The limitation of this habitat, combined with a growing concern on the part of fishermen and resource managers that populations of spotted seatrout are declining, prompted a detailed examination of the role of seagrass beds in the trophic ecology of Alabama populations of spotted seatrout.

Simply stated, the ultimate goal of the study is to answer the question "Are grassbeds trophically important to spotted seatrout?" Several factors, however, complicate what seems to be a simple question. Most fish eat different food items at different food items at different ages and the possibility exists that a grassbed might be critically important to a species only at a particular life stage. Livingston (1982) has developed a technique using cluster analysis of prey similarity among

size classes to identify the stages of changes in food preference with increasing size. Each growth stage in the feeding progression is known as an ontogenetic trophic unit (OTU) and is based on examination of gut contents of a range of size classes.

A second factor to be considered is seasonal movement of spotted seatrout within their range. Brackish or marine grassbeds may be utilized for feeding only at certain times of the year. Therefore the question of trophic importance of grassbeds to spotted seatrout can be best answered by developing a matrix defined by months as column headings and OTU's as row headings. Data, preferably with confidence intervals, indicating the similarity of spotted seatrout diet and food available in seagrass beds would fill the array. Thus, our question is both asked and answered for each OTU/month combination.

Field sampling to assess available food at 4 experimental sites within coastal grassbeds as well as at 4 unvegetated control sites began in June and has continued on a monthly basis to date. Preliminary evaluation of sampling methodologies reveals that all are adequate to capture the small crustaceans and fish which make up the seatrout diet. Identification and quantification of these organisms is in progress.

The EPA-funded study of seafood wastewater disposal in marshes was completed by Dr. Stout. Her results indicated that the high marshes could assimilate reasonable levels of wastewater. The volumes produced by a community like Bayou La Batre probably cannot be handled in an economically feasible manner, but the procedure could be useful for the isolated processor who cannot physically hook up to a sewer system.

Dr. Schroeder is continuing his work on transport processes and sediment distribution east of the Mississippi Delta with his colleagues at LSU. Mr. Randy Abston, a graduate student in the Department of Geology at

UAT, is responsible for the review and synthesis of the historical data dealing with sediment distribution patterns. Mr. Abston plans to conduct a research project associated with sediment dispersal off coastal Alabama for his Masters thesis. To date this cooperative research effort has produced one poster paper for a national meeting, one manuscript submitted to an international journal and is presently preparing a second poster paper and two additional manuscripts are being prepared. Funding for the second year effort looks very promising from both the Louisiana and Mississippi-Alabama Sea Grant Programs.

The Weeks Bay Estuarine Sanctuary has provided an exciting vehicle for an expanded research effort from the Sea Lab. Drs. Stout, Schroeder, Hopkins and Marion, with John Dindo have all received funding for projects addressing baseline levels of wetlands, nutrients and indicator species as well as the hydrographic description of the bay.

John Dindo has received modest support from the state non-game program for his doctoral work in the Cat Island heronry. This is an exciting biological site and may be the cornerstone to a larger effort. Ornithologists from other areas are beginning to notice our program, one has expressed a desire to teach and perhaps spend a sabbattical here.

ADECA has funded a review of the old CAB data base and Drs. Hopkins, Heck and Crozier are all providing queries to the system to evaluate its utility. Randy Horton has already produced significant material in response to these requests using the IBM PC-AT, and its DB III and BMDP software.

Mike Dardeau has continued to work with the cystic fibrosis researchers at UAB and his curiosity about the natural history of the sipunculid worm resulted in a proposal to the Florida non-game program

which was declined but will be pursued intramurally and with UAB support. Dr. Cline (UAB) continued his work with maintaining populations of the worm. They have learned that the indicator cells may be obtained repeatedly from the worms without jeopardizing the mucus assay procedure. Population maintenance will be the immediate objective of the DISL effort and facilities are being designed to accomodate the worms.

EDUCATIONAL:

There has been a recurring suggestion for some years that MESC could most effectively influence lower education by infusing marine units into various levels of the existing science curriculm. This effort has been resurrected by a request from ADECA to assist them in raising local awareness levels with regard to coastal resource issues and use conflicts. An example was prepared and a proposal funded for the production of several units.

In a effort to upgrade the offerings in Discovery Hall, John Dindo prepared proposals for computer capability support from Tandy (Radio Shack) and IBM. These proposals were declined as were last year's but Dr. Heck will become involved in the preparation of future efforts and this submission will be renewed.

INTRAMURAL:

As a result of efforts to prepare a coherent approach to the EPSCoR proposal Dr. Stout generated a real initiative in assessing the role and function of grassbeds in state waters. This effort currently involves a couple of graduate students and has been joined by Dr. Heck.

Dr. Crozier has continued the monitoring of beach morphology on Dauphin Island and Perdido Key. The research protocols are being modified to reflect management applications and discussions are underway with ADECA

and the Baldwin County Coastal Program for some funding. Beach response to low energy wave climate and "baseline" conditions were established at 14 monitoring points this summer.

John Dindo has maintained the programmatic interest in the "artificial" reefs of the offshore area. There seems to be a new initiative in this area and he has submitted a proposal to the Gulf Coast Conservation Association for design and fabrication of FADs (Fish Aggregating Devices).

The most intriguing work being pursued in-house revolves around the investigation of the relic shorelines and natural "hard-bottom" areas found offshore by John Dindo and Dr. Schroeder. Although well known to local fisherman, existence of these areas is not acknowledged in the scientific literature. Two geologists from UAT, Drs. Al Shultz and Joe Benson, have joined in the research effort and are providing detailed analysis of the rocks obtained from a number of sampling sites. To date the preliminary interpretation of the thin section x-ray diffraction and SEM results indicate that the environmental settings in which these rocks were laid down range from open water shallow-marine to strongly reducing fresh water back bays and lagoons. The geochemistry of samples from these areas and the origin and history of these features may be the most exciting science to come out of the lab to date.

The living communities of the area have not been systematically examined either. These "hard bottom" studies will be the focus of a renewed continental shelf research program using the A. E. Verrill, involving the resident faculty and any campus scientists who wish to participate. The activities at the various sites will be enhanced by the availability of an experimental Remote Operated Vehicle (ROV) designed and