

M E
S C

Marine Environmental Sciences Consortium

ANNUAL REPORT
1978 - 1979

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DIRECTOR'S PREFACE:

For once an adequate excuse for the lateness of my reports has been provided and the legal term 'act of God' has been clarified. On the evening of September 12, hurricane Frederic struck Dauphin Island with winds recorded at 146 miles per hour. The Sea Lab was significantly damaged, losing two buildings and most of the roofs from 20 other buildings. On September 27, the administrative offices reopened and routine operations were restored on October 2. This is a tremendous tribute to the students and staff of the facility and MESC should be quite proud. Besides cleaning up and reorganizing the laboratory, these people assisted island residents clear roads, transported them to and from the mainland and provided equipment to Civil Defense and the National Guard.

To resume a more positive note, progress continued during the year on developing the identity of the consortium. This was enhanced by the Board transferring full fiscal authority to the Business Office at the Sea Lab. Discovery Hall more than doubled its productivity over last year and the preliminary plans for a small multi-purpose lecture building have been completed. The impact of the storm on this project has not yet been evaluated.

On a sad note, we record the death of Mr. George Allen. Though never formally associated with MESC, Mr. Allen was the first "state marine biologist" having served as head of the old Seafood Division of the Department of Conservation. He then served many years with the U.S. Army Corps of Engineers, first in Mobile and then Atlanta. He never wavered in his love and devotion to the Alabama coastline and Mobile Bay. He helped us develop early programs through the Corps and as an adviser to the Sea Grant Program. His passing was truly a loss to coastal Alabama.

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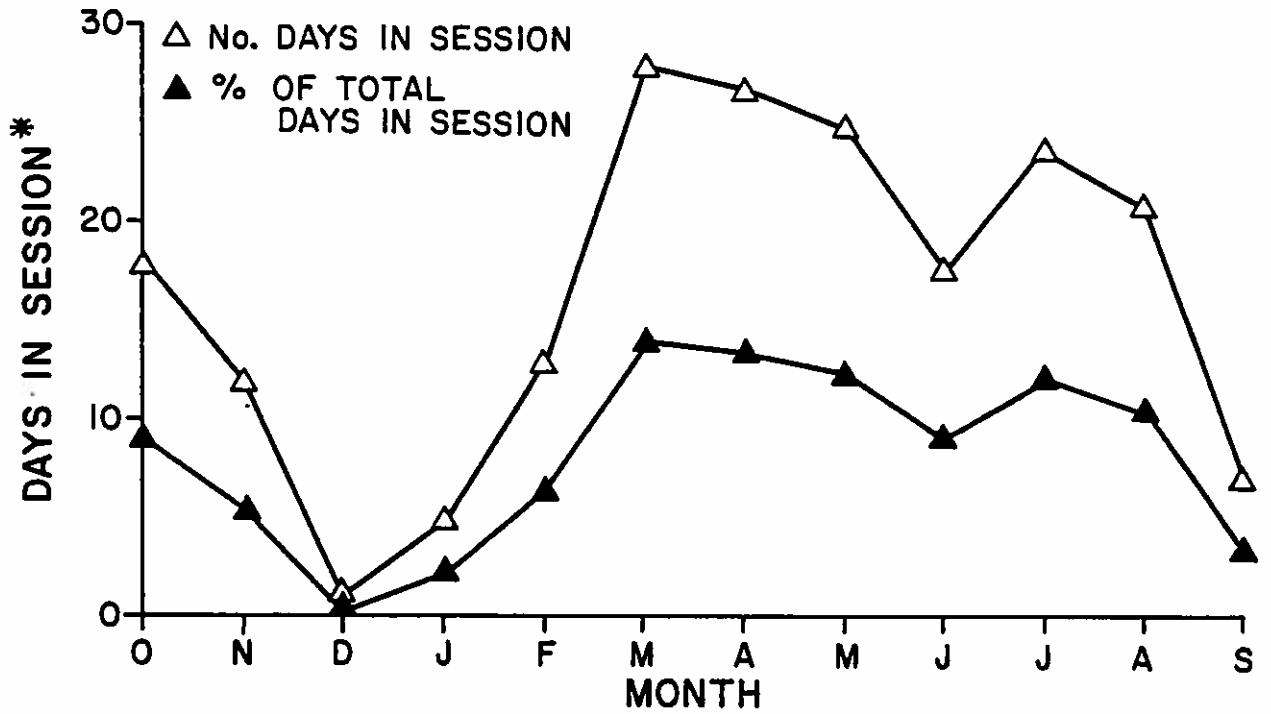
I. Instructional Element

A. DISCOVERY HALL PROJECT

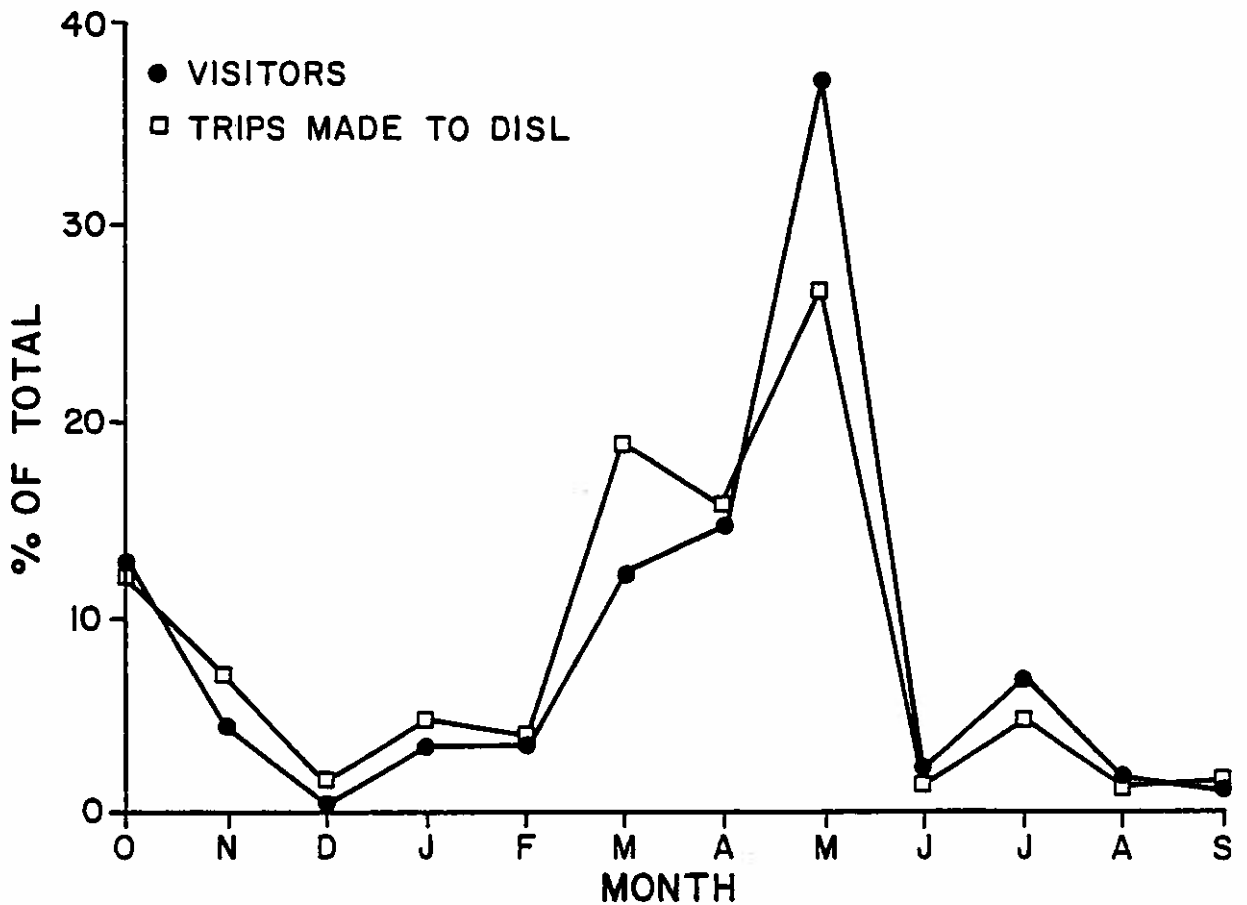
From its inception, the Discovery Hall Project has grown into a complex internal grouping of several educational and public service activities available throughout the programmatic structure of the Marine Environmental Sciences Consortium. The services in this grouping include High School Summer Institute, the Secondary School Short Courses, the Public Environmental Awareness Program, and the College Program. These discrete projects overlap with and are partially budgeted in the public service and academic support elements of the MESC College Program.

During the period from October 1978 - September 1979, the Discovery Hall Project was in session a total of 198 days. In session refers to those days when any available program is conducted at the Dauphin Island Sea Lab. In addition, multiple activities may be ongoing on any particular day. Analysis of the usage of the physical facilities in relation to month shows the peak usage of the facilities encompasses January - August with a secondary peak encompassing October and November (See Figure 1). Moreover, the slight decline in usage during the month of June would represent the time spent preparing for the summer programs.

Excluding the High School Summer Institute, a total of 3,356 people participated in the several remaining programs resulting in an increase of 119% over the same period last year. In addition, 84% of the participants were residents of Alabama. The remaining 16% represented 11 additional states. Monthly analysis of participation percentages shows peak participation during the month of May comprising 37% of the total (see Figure 2). Secondary peaks are also visible during October and July comprising 15% and 7%, respectively.



*IN SESSION REFERS TO ANY ACTIVITY AVAILABLE THROUGH DHP BEING CONDUCTED.



Facility utilization of the Dauphin Island Sea Lab is presented in tabular form (see Table 1). A total of 127 trips were made through the various programs. The most requested services were living space, lab space and guided tours comprising 41%, 20%, and 45% of total usage, respectively.

In addition, classroom lectures, career day programs, and a teacher workshop were conducted through Discovery Hall Project at facilities other than the Sea Lab (see Table 2). These programs were conducted at 9 schools representing 5 Alabama counties (Mobile, Tuscaloosa, Jefferson, Clark, Escambia) and Gulf Breeze, Florida.

HIGH SCHOOL SUMMER INSTITUTE

A total of 49 students participated in the 2 4-week High School Summer Institutes. Sessions were conducted from June 23-July 13, 1979 and July 23-August 17, 1979. Sixty percent of the total number of students were Alabama residents (see Table 3). Of these, fourteen Alabama counties were represented with the largest participation from Jefferson county (see Table 4). The remaining 39% of students represented 9 additional states. In addition, all students participating received credit for the course.

SECONDARY SCHOOL SHORT COURSES

Twelve short courses in marine science were conducted for 280 middle and high school students during the spring, 1979. The courses varied from several days to 1½ weeks. Fourteen schools representing five Alabama counties and 5 additional states participated (see Table 5). The short courses series accounted for 8% of the total participation in the Discovery Hall Project and 11% of the trips to the lab.

PUBLIC ENVIRONMENTAL AWARENESS PROGRAM

Within the Discovery Hall Concept, the Public Environmental Awareness Program is directed toward non-formal education of the public. A series of 61 lab tours, field experiences, cruise programs, seminars, etc. were conducted

Table 1. Discovery Hall Project Summary, October 1978 - September 1979

	No. No.		DISL FACILITY UTILIZATION (# TRIPS)											
	Trips	Participation	1	2	3	4	5	6	7	8	9	10	11	12
College (MESCC)	40	428	35	16	3	14	8	14	0	0	0	2	1	5
College (Non-MESCC)	12	250	10	5	4	2	2	3	1	0	0	2	0	0
PEA (K-12)	44	1637	5	2	39	0	0	2	4	2	0	11	0	0
PEA (Civic, Scouts, etc.)	17	761	2	2	11	1	2	1	1	1	6	3	0	0
Secondary School Short Courses	14	280	N / A											
Total	127	3356	52	25	57	17	12	20	6	3	6	18	9	5
Alabama participation total	105	2808												
Alabama participation percent of Total	82.7	83.7												
Percent of Total			41	20	45	13	9	16	5	2	5	14	7	4

1. Living space
2. Lab space
3. Guided
4. Vessel

5. Technician
6. Gear
7. Discovery Hall conducted Program
8. Faculty Participation

9. Meeting space
10. Field trip
11. Cruise Program
12. Point aux Pins field station

Table 2. Career Days & Lectures

Davidson & Shaw	2
McGill-Toolen	1
Shades Valley (Birmingham)	1
Woodland Forrest (Tuscaloosa)	1
Gulf Breeze Middle (Florida)	2
Gulf Breeze High	1
Escambia County High School	1
Mobile County Teacher Workshop	1

TABLE 3
DISCOVERY HALL PROJECT 1979
SUMMER HIGH SCHOOL MARINE BIOLOGY INSTITUTE

State Represented	No. of students	No. for credit	Percent of total
Alabama	30	30	61
Tennessee	6	6	12
South Carolina	2	2	04
Mississippi	1	1	02
Georgia	3	3	06
Illinois	1	1	02
Missouri	1	1	02
North Carolina	1	1	02
Louisiana	3	3	06
Virginia	1	1	02

TABLE 4
DISCOVERY HALL PROJECT 1979
SUMMER HIGH SCHOOL MARINE BIOLOGY INSTITUTE

Alabama County Represented	Number Students	Percent of Alabama Total	Percent of Total
Mobile	4	13	08
Jefferson	8	26	16
Madison	4	13	08
Washington	1	03	02
Coffee	1	03	02
Morgan	1	03	02
St. Clair	3	10	06
Montgomery	1	03	02
Lauderdale	2	06	04
Walker	1	03	02
Covington	1	03	02
Tuscaloosa	1	03	02
Blount	1	03	02
Lee	1	03	02

Table 5. Discovery Hall Participant Breakdown, October 1978 - August 1979

MESC Schools

12 schools (UAT, UAB, UAH, SU, AU, BSU, HC, LU, TI, TC, USA, TC, TSU)

12.6% of total participation
31.5% of trips

Other Colleges

11 schools (UT Knoxville, Sargamon St. Univ., Texas A & M, LSU, Univ. of South Carolina, Morehead State Univ., No. Illinois Univ., Snead St. Jr. College, Selma Univ., Judson College, Calhoun St. Community College)

7% of total participation
9% of trips

PEA (Civic, Scouts, etc.)

13 organizations (Comm. Action of Baldwin County, Girl Scouts, GERS, Grove Hill 4-H, Ala. Conservancy, Oiled Bird Workshop, CEEC, AOS, MACAC, Libra House, Alabama 4-H, Cottage Hill Baptist Church)

22% of total participation
13% of trips

PEA (K-12)

34 schools Representing Alabama counties (Clark, Mobile, Baldwin, Montgomery, Madison, Autauga, Greene, Calhoun) and Gulf Breeze, Fl, Ringgold, GA, Baton Rouge, LA)

49% of total participation
35% of trips

Secondary School Courses

14 Schools Representing Alabama counties (Montgomery, Escambia, Madison, Autauga, Greene) and Memphis, TN; Bloomfield Hills, MI; Greenwich, Conn.; Metairie, LA; Luling, LA; Louisville, KY.

8% of total participation
11% of trips

at requests as diverse as K-12 classes, scouting, programs for both the gifted and the disadvantaged and others. A total of 2,398 individuals were exposed to the Lab and marine/coastal environments. This phase of the Discovery Hall Project represented 71% of total participants and 48% of the trips to the facilities. A total of 34 schools representing 9 Alabama counties participated. In addition, 3 additional states were represented.

COLLEGE PROGRAMS

Under the Discovery Hall framework, the College Program consists of logistical support and technical assistance for college field experiences. A total of 52 trips were made, 40 by MESC schools and 11 by non-MESC schools. Twelve of the nineteen MESC institutions utilized the facilities, personnel, and gear of the Sea Lab which represented 12.6% of the total participants and 31.5% of trips. In addition, the 11 non-MESC schools contributed 7% of the total participant and 9% of the trips to the lab.

Four percent of the trips were conducted at the Point aux Pins field station. The field station is now an integral part of the activities available in the College Program. Moreover, this activity could not have been possible without the complete renovation of the facility by Mr. George Oakes.

PHYSICAL FACILITIES

Discovery Hall was severely damaged by Frederic and the construction of the new instructional facility will probably be delayed by the loss of the bridge. The current plan calls for the establishment of the Discovery Hall projects within Endeavor Hall until new facilities are prepared.

CONCLUSION

In conclusion, the year has been an overwhelming success. The major change in scheme has been the shift toward year-round facility usage. On the average, the facilities were used 16.5 days during each month with a low of 1 day in December and a high of 28 days in March (see Table 6). In addition,

TABLE 6
DISCOVERY HALL PROJECT
DAYS IN SESSION

Month	Days	Percent of Total
October	18	9.2
November	11	5.6
December	1	0.5
January	5	2.5
February	13	6.6
March	28	14.1
April	27	13.6
May	25	12.6
June	18	9.1
July	24	12.1
August	21	10.6
September	7	3.5

new programs initiated for the PEA program include the cruise programs and the field trip series. The Point aux Pins field station was initiated as a College Program activity.

Due to the increased workload, these activities would not have been possible without a sincere and dedicated effort by Mr. John Dindo. It is important to note that the resident faculty and graduate students assist these programs as needed and without their help, it would be impossible to accomodate all the requests.

B. SUMMER SCHOOL - 1979

Summer school enrollment fell during 1979. The biggest single factor responsible for this decline from 1978 was the shortage of graduate - level offerings. During 1978, Data Management, to be taken for graduate credit only, had an enrollment of 16, many of whom were commuting graduate students from the University of South Alabama campus.

The undergraduate enrollment figures of the past five years have indicated a leveling off at about 100 to 115 students/summer. Academically this figure is near the ideal, because classes are of optimal size for instructional purposes. In addition, "standby" status of late registrants is minimized.

The balance of course offerings in each of the two summer terms was much improved when compared to summer 1978.

The inclusion of this very different course will hopefully be continued and should reflect the breadth of the Consortium's interest in coastal affairs. Marine and Environmental Law was the sole new offering during 1979.

Although exact comparisons were not computed, it appears that there was a far greater number of "first time" students during 1979. It will be interesting to note whether this is followed by the reverse pattern in summer 1980, or whether we are witnessing a new trend in the Sea Lab.

Expenditures this summer included nearly \$8,000.00 in new microscopes, partially alleviating a particularly troublesome deficiency in the past.

Table 7. Summer School Enrollment Summary

1972 -	71	1976 -	115
1973 -	75	1977 -	109
1974 -	89	1978 -	136
1975 -	106	1979 -	100

Table 8. Schools Represented, Summer 1979

Alabama State University	1
Auburn University	6
Birmingham Southern College	6
Jacksonville State University	6
Livingston State University	5
Samford University	1
Spring Hill College	6
Talladega College	3
Troy State University	4
University of Alabama, Tuscaloosa	24
University of Alabama, Birmingham	5
University of Alabama, Huntsville	1
University of North Alabama	6
University of South Alabama	<u>26</u>
	100

It is virtually impossible to utilize evaluations for program comparison purposes (Table 9) but purely subjective observation of student response during the summer indicates that this summer program may have had the best cadre of instructors to date.

The Colloquium series, in its second year, was again well received. The guest speakers were of exceptional quality and competence, their topics varied and relevant. Program Committee members appear to favor incorporation of the series into the Seminar course offering.

Table 10. 1979 Colloquium Speakers

Metabolic Respiration of Sea Anemones Under Stress
Dr. Ross Ellington, University of Southwestern Louisiana

Table 9. Summer School Faculty Composite Evaluations (5 highest, 1 lowest)

	Instructor Knowledge	Instructor Enthusiasm	Instructor Interest in Students	Course Presentation Clear & Coherent	Exam Coverage Representative	Informed of Progress	Lab/Field Exercises	Motivation of Student Toward Discipline	Recommend to Others
Marine Biology (Shipp)	4.8	4.4	4.0	3.7	4.0	4.2	3.0	3.5	3.6
Marine Invert. Zoology (Modlin)	4.7	4.7	4.9	4.5	4.5	4.5	4.4	4.2	4.5
Marine Botany (Pecora/Stout)	4.7	4.6	4.4	4.1	4.2	4.4	4.5	3.8	4.4
Coastal Ornithology (Holliman)	5.0	4.9	5.0	4.5	4.5	4.6	5.0	4.5	5.0
Marine Geology (Canis)	4.5	4.1	3.3	3.4	3.2	4.0	3.4	2.7	2.7
Marine Tech Methods I (Crozier)	3.9	4.3	4.0	4.0	4.0	3.7	3.5	3.7	4.0
Commercial Marine Fish. (Rees)	4.3	4.4	4.6	4.0	4.5	3.8	4.9	4.0	4.8
Marine Vertebrate Zoology (Boschung)	4.3	3.3	3.0	2.5	3.1	3.4	3.3	3.3	3.1
Oceanography (Schroeder)	5.0	4.9	4.8	4.4	4.8	4.9	4.5	4.2	4.3
Marine Ecology (Abele)	4.7	4.1	3.9	3.2	4.0	3.0	2.8	3.3	3.3
Marsh Ecology (Ivester/Stout)	4.1	4.2	4.3	4.0	4.3	4.4	4.0	3.7	3.8
Environmental Law (Bruggink)	4.5	4.6	4.4	3.5	3.5	3.4	3.8	3.5	4.1

Table 10. 1979 Colloquium Speakers (continued)

- Careers in the Marine Sciences - Prospects and Pitfalls
Dr. Thomas Scanland, Dames & Moore Consultants
- Protozoa of Mobile Bay
Dr. E. E. Jones, University of South Alabama
- Hurricanes - The Atlantic Ocean, Caribbean Sea, and Gulf of Mexico
Mr. Gene Merritt, National Weather Service
- Species Diversity of some Caribbean Shelf Regions
Dr. John Briggs, University of South Florida
- Nutrient Cycles in Estuaries
Mr. Jonathan Garber, University of Rhode Island
- Experiments with Islands and their Animal Communities
Dr. Dan Simberloff, Florida State University
- Meiofauna in the Food Web - Do They Really Belong?
Dr. Bruce Coull, University of South Carolina
- Endangered Marine Turtles
Dr. James Tyler, NOAA, Office Endangered Species

C. ACADEMIC YEAR 1979

The 1979 academic year, other than summer school and graduate student activities which we treated elsewhere in the report, is summarized below:

Table 11. Academic Year Activities

Term: Fall 1978

<u>COURSE</u>	<u>TOTAL CREDITS</u>
Benthic Community Structure (Ivester)	24

Term: Winter 1979

<u>COURSE</u>	<u>TOTAL CREDITS</u>
Marine Zoogeography (Shipp)	24
Directed Research	28

This activity was well below those of the previous academic year. This was due in part to the extensive commitment of many of the resident graduate student population to contract research the vacant faculty slot in the Marine

Animal Physiology. A moderate upturn is anticipated during the next two years.

The following tentative schedule of Fall/Winter/Spring offerings has been adopted and promulgated to affiliated students:

Fall 1979:	
Winter 1980:	Estuarine Science
Spring 1980:	Oceanology of the Gulf of Mexico
Fall 1980:	Physiology of Marine Organisms
Winter 1980:	Marine Zoogeography
Spring 1981:	Benthic Community Structure

D. GRADUATE STUDIES

The graduate studies element was new this year and the only funds allocated were for student assistantships. These are awarded on the basis of academic merit as determined by a standing review/advisory committee of graduate deans.

The importance of this element cannot be overemphasized. These student represent the backbone and muscle to our academic effort and hopefully, the funding level can be increased.

Interest in graduate studies remains high despite the job market. Over 100 inquiries have been received and answered over the past year. Funding (Table 13) is still dominated by extramural support.

II. Research Element

The environmental activities of the research faculty have traditionally been divided geographically into two areas, one dealing with the dynamic processes of the continental shelf and slope and the other with estuarine phenomena. The thrust of both are interdisciplinary in that we attempt to deal with the biological characteristics of these areas and their interaction with

Table 12. MESC Graduate Studies Element.

Degrees completed

Lee, Chong Koo, M. S., The university of Alabama, 1978. The Seasonal and Spatial Settings of Oyster Spat and Other Settling Organisms in Mobile Bay in Relation to Hydrography and Water Quality.

Lutz, Charles H., M. S., The University of Alabama, 1978. The Association of the Sea Anemone, Calliactis tricolor (Le Seur), with the crab Hepatus epheliticus (Linnaeus) in the Northern Gulf of Mexico.

Research complete, in process of writing

John Dindo, UAB, M. S.

Eric Livingston, UA, M. S.

Ross Lysinger, UA, M. S.

New Students

Glenn R. Parsons, M. S. program, USA

William Miller, M. S. program, UA

Marine related students on member campus

Chris Dyer, M. S. program UA

Rebecca Tuttle, M. S., The University of Alabama. 1979. Allozymic and Systematic Analyses of Three Co-Occurring Forms of the Starfish Genus Othilia (= Echinaster).

Enrollment of Resident Students

The University of Alabama
10 M. S. (2 completed)
1 Ph.D.

The University of Alabama in Birmingham
3 M. S.
2 Ph.D.

The University of South Alabama
13 M. S.

Table 13. 1978-1979 Graduate Student Progress and Funding

NAME, SCHOOL, DEGREE		DATE ENTRANCE	TENTATIVE GRADUATION	ADVISOR	FUNDING SOURCE
Biksey, Thomas M. (UA)	MS	8/78	8/81	Ivester	MESG
Black, Eric W. (UAB)	PhD	9/76	12/79	Shoemaker/ Crozier	USF & W
Branstetter, Steven G. (USA)	MS	7/77	5/80	Shipp	MASGC
Bush, Daniel F. (USA) Term.	MS	1/78	1/79	Shipp	MASGC
Dardeau, Mike R. (USA)	MS	9/76	5/80	Shipp	BLM
Dawson, Steven C. (UAB)	PhD	7/76	5/80	Cline/ Crozier	USCOE
Dindo, John J. (UAB)	MS	6/76	12/79	MacGregor/ Crozier	MESG/DHP
Dowe, G. Steve (USA)	MS				
Gilbert, Douglas K. (UA)	MS	1/77	12/80	Hopkins	BLM
Gilbert, Katherine	MS	9/76	5/80	Hopkins	MSP/PRIVATE
Goeke, Gary (USA)	MS	6/77		Dean/ Shipp	PRIVATE
Harp, J. Charles (USA)	MS	5/75		Shipp/ Ivester	BLM PRIVATE
Hooker, Allan F. (UA)	MS	8/77	5/80	Hopkins	MASGC
Johnson, Paul G. (UAB)	MS	9/75	12/79	Marion/ Hopkins	PRIVATE
Lee, Chongkoo (UA)	MS	9/75	12/78	Hopkins	MASGC
Livingston, Eric H. (UA)	MS	8/75	12/79	Hopkins	PRIVATE
Lutz, Charles H. (UA)	MS	9/75	12/78	Hopkins	BLM
Lysinger, W. Ross (UA)	MS	5/76		Schroeder	USCOE
Marley, Don (USA)	MS	9/77	5/80	Shipp	
Nance, Mike (USA)	MS	9/76		Shipp	MASGC
Omholt, Paul E. (UAB)	MS	9/77		Cline/ Crozier	USCOE
Parsons, Glenn R. (USA)	MS	9/78	5/80	Shipp	
Ranasinghe, J. Ananda (UA)	MS	9/78	5/80	Hopkins	MESG
Reams, Robert (USA)	MS	1/77	12/80	Shipp	USCOE
Shipp, Linda P. (UA)	PhD	9/78		Hopkins	
Stewart, Julian R. (USA)	MS	9/76		Shipp	MASGC
Swift, I. Austin (USA)	MS	12/77		Shipp	
Williams, Larry W. (USA)	MS	9/77	5/80	Shipp	

Table 14. Publications of MESC Graduate Students

- Lysinger, W. R. and W. W. Schroeder. 1979. Hydrography and circulation of Mobile Bay. Proceedings of the Symposium on the Natural Resources of the Mobile Estuary, Alabama. U. S. Fish and Wildlife Service. In Press.
- Dindo, J., R. MacGregor and G. Crozier. 1978. Analysis of Reproductive Hormones and Plasma Lipid Levels Associated with the Migration of the Striped Mullet, Mugil cephalus L. ASB Bulletin 25 (2): 39 (Abstract).
- J. C. Harp (with M. S. Ivester). 1978. Effects of Marshland on Meiofauna Community Structures. Amer. Zool. 18(3): 661 (Abstract).

the atmospheric and aquatic "climatology".

The third research element deals with organismic processes and biological adaptations to the areas mentioned above. This element remains embryonic but the acquisition of Dr. Robert Dean by the biology department at UAB should strengthen the program greatly. The instrumental capability of the element has been one of the great advances over the past year (Table 15).

A. SHELF/SLOPE PROCESSES

The artificial reef program remains one of the most consistent and productive of the offshore efforts. Current and temperature records have been maintained from Anderson Reef and with luck, a current meter rode out Frederic and should provide some truly dramatic data.

The biological data on reef fish communities was reviewed in a paper by Bob Shipp and John Ranasinghe at a reef conference in Dayton Beach Florida in September. Mr. Ranasinghe expects to pursue his dissertation on some aspect of reef ecology and will assume the role played by Dr. Doug Clarke.

Dr. Tom Hopkins has continued his biological studies of the benthic flora and fauna of the Florida Middle Grounds with funding from the Bureau of Land Management. He was joined in this study by Dr. Will Schroeder who has obtained both time series and vertical profiles of temperature, salinity and current parameters for the water column at the station. Those data will be used to produce a first order climatological characterization of the area.

Additional work is anticipated for the Mississippi-Alabama shelf in conjunction with Corps of Engineers' interest in offshore spoil disposal. A return to the De Soto Canyon via submersible is being planned with the Harbor Branch Foundation for the summer of 1980.

B. ESTUARINE PROCESSES

A great deal of effort has been expended in this area as we have attempted to assist both the Coastal Area Board and the Corps of Engineers in getting a grip on several problems facing them.

Drs. Judy Stout and Susan Ivester completed a major study of marsh management techniques which included both fertilizing and controlled burning. This project has produced a possibly viable solution to the problem of seafood wastewater disposal. Their data have suggested that the native marshes may have great assimilative capacity for this material and that marsh productivity may in fact be enhanced. This hypothesis will be tested in the coming year.

At the request of the Coastal Area Board (CAB), Drs. Hopkins, Crozier and Stout produced a biological study plan which will essentially establish a mechanism by which the CAB may be able to monitor the "health" of Alabama's coastal waters.

The plan has already yielded contracts to the Dr. George Lamb (University of South Alabama) for a sediment map of Mobile Bay, Dr. Tom Hopkins (University of Alabama) for a methodological study of biological monitoring and a data gathering exercise by the Gulf Universities Research Consortium (GURC), which is affiliated with MESC through UAB's membership in both groups. Their personnel are particularly effective in ecosystem analysis by computer usage.

The largest project in the category has certainly been the 15 month pre-construction survey of the portion of Mobile Bay adjacent to the Theodore Industrial Park. The Corps of Engineers is constructing a large island from the material dredged from the projects associated with the ship channel and barge canal. The final report was presented to the Corps this summer. A monitoring scope of work is being discussed at this time and a longer term study is hoped for.

C. ORGANISMIC PROCESSES

This element has experienced very significant instrumental growth (Table 15) and the arrival of Dr. Robert Dean (Appendix C) is anticipated for January 1, 1980. This should provide the impetus needed to get the program active.

Several graduate student from UAB have refined their techniques and mastered the new gear acquired. The main thrust remains in the area of ion transport and exchange.

III. Public Service.

The Sea Lab personnel have continued to provide speakers to public groups (see section VI) and have expanded the Public Environmental Awareness (PEA) element (see IA). Requests for assistance from the Coastal Area Board and the Marine Resources Division have been prompt and hopefully useful.

The DISL meteorological station has operated for over 5 years. Besides providing supportive data to numerous in-house research project it continues to serve as a real time observational unit for the National Weather Service at Bates Field in Mobile, Alabama as well as an official NWS Climatological Station. Other organizations that rely on the station's data are: the F. D. A. Gulf Coast Technical Services Unit; Marine Resources Division, Mobile County Public Health Dept. (mosquito control), and the U. S. Coast Guard. Data for calendar year 1978 has been published in the DISL Technical Report Series.

It is too soon to know the value of the data collected before "Frederic" destroyed the sensors, but it is hopefully going to be useful in future hurricane situations.

NORTHEAST GULF SCIENCE 1979

During fiscal 1979, Volume 2, No. 2 and Volume 3, No. 1 of Northeast Gulf Science were published with 75 and 52 pages respectively. Total pagination

Table 15

Centrifuges

Beta-fuge Model Ser-B179
Rotor - Lourdes VRA
Rotor - Lourdes 9-RA-24

I.E.C. HN-S Ser-AC5890
Rotor - Swinging Bucket
Rotor - Hematocrit

Beckman L4 Ultracentrifuge Ser-369
Rotor - 600 ml zonal
Rotor - Type 42.1 Ser-1791

Spectrophotometers

Bausch & Lomb Spectronic 100
With sipper Ser-9505 TD
Spectronic system 400 Ser-583K2

Perkin-Elmer Atomic Absorption
Spectrophotometer Model 107 Ser-J1665

Perkin-Elmer Double Beam
Spectrophotometer Ser-23268 *Model #*
With Flow Thru System

Perkin-Elmer Model 561 Recorder
Ser-01068

Gilson FC100 fractionator Ser-147F941 ←

Nuclear Chicago Model 6850
Scintillation Counter Ser-132

Nuclear Chicago Model 1085
Gamma Counter Ser-622-3993

Mettler P1200 Balance No. 570614
Mettler H20 Balance No. 471046
Corning Chloride Meter 920 M No. 4438
Branson Sonifier Power Supply No. 6834
Branson Sonifier Converter No. 450
Extech pH/Temp. Meter 671 No. 670801
Virtis tissue homogenizer 23 No. 6-105-AF
Gilson Differential Respirometer No. 57686
Osmette Precision Osmometer No. B09131
(2) Haake Water Pumps No. 62378 & 72708
Buchler Polystaltic Pump No. 76709
Staco Variable Autotransformer No. 7806
Bausch & Lomb Refractometer No. 7098VD
Precision Vari-heat Hot Plate No. 10-AC-4

Nova 1 Analyzer No. A835520-1-447
Polyscience Refrigerator Unit No. 2069
Electrophoresis chambers
Gelman horizontal slab
Buchler vertical column
Chromatography columns (4 variable sizes)
Corning pH meter Model 10 No. 33706
Turner Fluorometer No. B1505
Welch Duo-Seal Vacuum Pump No. 127462
Hellige turbidimeter No. 10161
Hach turbidimeter Model 2100 A
No. 774A43
Buchler 3-1500 Constant Power
Supply No. 73739
Photovolt Densicord Model 542
No. 11442

for Volume 2 was 152 pages. As with previous issues, total run is 1,000/number. Subscriptions and exchanges continue to slowly increase, and back issue sales are also increasing. About 1/3 of each issue is archived.

Cost of each number averaged slightly less than \$4,000.00 and more than half is recovered by page charges, reprint receipts, and subscriptions. Value of nearly 100 library exchanges is irregular and not computed but probably exceeds \$1,500 year.

Drs. Robert Shipp and Susan Ivester remain as editor and associate editor respectively.

IV. Library

The MESC Library has continued to make progress in increased quality and quantity of holdings. Efforts to acquire journal back issues have resulted in 496 new numbers being added to the holdings this year. All major journal titles have been bound and a program of annual binding of new numbers instituted. Award of a HEW Library Grant of \$3,906.00 represents the third year of such funding and has provided critical monies for binding and back-issue acquisition Table 16.

Connie Mallon and Dr. Stout attended the annual meeting of the International Association of Marine Science Libraries and Information Centers. Contacts established through this organization have assisted the library in interlibrary loan requests and locating of back-issues.

Frederic caused extensive damage to the Library roof. Due to dedicated efforts of staff and students, the holdings were all removed to the teaching labs of Marine Science Hall. Water damage is obvious on a small percentage of titles, but total loss has not been assessed.

Table 16. Library Statistics - October 1, 1978- September 11, 1979

BOOKS:

Total Book Holdings	2602	
Books and Publications Processed	277	
Expenditures for Books & Publications		\$3,758.23

REPRINTS:

MESC Reprints	5515	
Reprints Processed	375	

INTERLIBRARY LOANS:

ILL Requested	183	
Unable to Complete	9	
Expenditures		109.86
ILL Request Received & Filled	7	

JOURNALS:

Current Subscriptions to Faxon	68	
Expenditures		5,742.41
Memberships	4	
Expenditures		101.00
Current Titles	494	

EXCHANGE PUBLICATIONS:

Institutions Agreeing to Exchange	65	
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BACK ISSUES:

Volumes or Issues	496	
Expenditures		1,026.39

BOUND VOLUMES:

NUMBER	202	
Expenditures		1,296.76

V. Academic Support

This category includes all those functions at the Sea Lab which support member schools' activities at the lab (IA) as well as the in-house research and educational activities.

The museum is composed of two sections:

1. Herbarium

The herbarium collection of Gulf algae has continued to develop in quality with the renewal of the Florida Middle Grounds study. It is expected that some materials collected in 1975-76 and damaged by sun bleaching will be duplicated. At the time of the present writing, Dr. Sylvia Earle and Dr. Hopkins are outlining a comprehensive report on the present knowledge of the algae of the Florida Middle Grounds. It is aimed for publication in 1980.

2. Invertebrate Repository

The repository now has about 450 linear feet of shelving for the invertebrate collection. We are still in the cataloging process. The collections are being significantly enhanced by a) the current BLM-FMG cryptofaunal study b) Dr. Modlin's summer session effort, and c) the CAB study at two sites in Mobile Bay. The latter two efforts will begin to fill in the estuarine fauna in a formal way.

The repository has had invertebrate specialists from the Florida Department of Natural Resources as guests. These specialists, Ms. Jennie Smith, Mr. Walter Jaap, Mr. David Camp, and Mr. Tom Perkins represented interests in octocorals, scleractinian corals, crustacea and polychaetes respectively. They were very kind in their praise of our facility and found their stay scientifically rewarding. We anticipate a visit from Dr. Linda Pequegnat, a noted expert in Caridean Crustacea.

The diving locker facility has functioned very well after reorganization and serves to support a) the extensive diving program under the BLM contract

on the FMG and b) the continued studies on Alabama's artificial reefs. New acquisitions include a 14' AVON Diver Recovery Vessel (Rubber inflatable) and a portable VHF radio for constant contact.

The technical support aspect of the diving program was greatly enhanced by sending Messrs. Lutz and Shapiro to a local "chamber operators" course and to a compressor repair course sponsored by Mako Engineering.

Vessel operations are summarized in Table 16. Comparisons to last year indicate an increase of 15% in users aboard the R/V G.A. Rounsefell and a similar increase (12%) in the nautical miles steamed. There was somewhat less usage of the R/V Flying Tiger than last year so the net use is roughly equivalent. The decline in "Tiger" use is due to an increased use of the 23' Thunderbird. This boat was completely renovated and renamed the "Spinner" in honor of the local shark known for leaping out of the water.

The bay survey boat was finally completed and delivered. Rigging and alterations are underway. The sea trials were disappointing as far as the speed of the hull and a better gear reduction is being sought. Minor damage was suffered during Frederic but hopefully the vessel will be operational by the end of the year.

With Executive Committee approval, we have entered into negotiations with the U. S. Coast Guard to obtain permission for a dock to be constructed adjacent to their existing boat slip. When this project is complete, the necessity of renting dock space at \$400/month will be eliminated.

The year has been made pleasant by many compliments being paid to Captains Tom Lamey and Marty Stapleton and Mr. Rodney Collier. All of these boatmen have enthusiastically joined and actively assisted virtually all research and educational efforts aboard the vessels.

VI. Faculty Activities

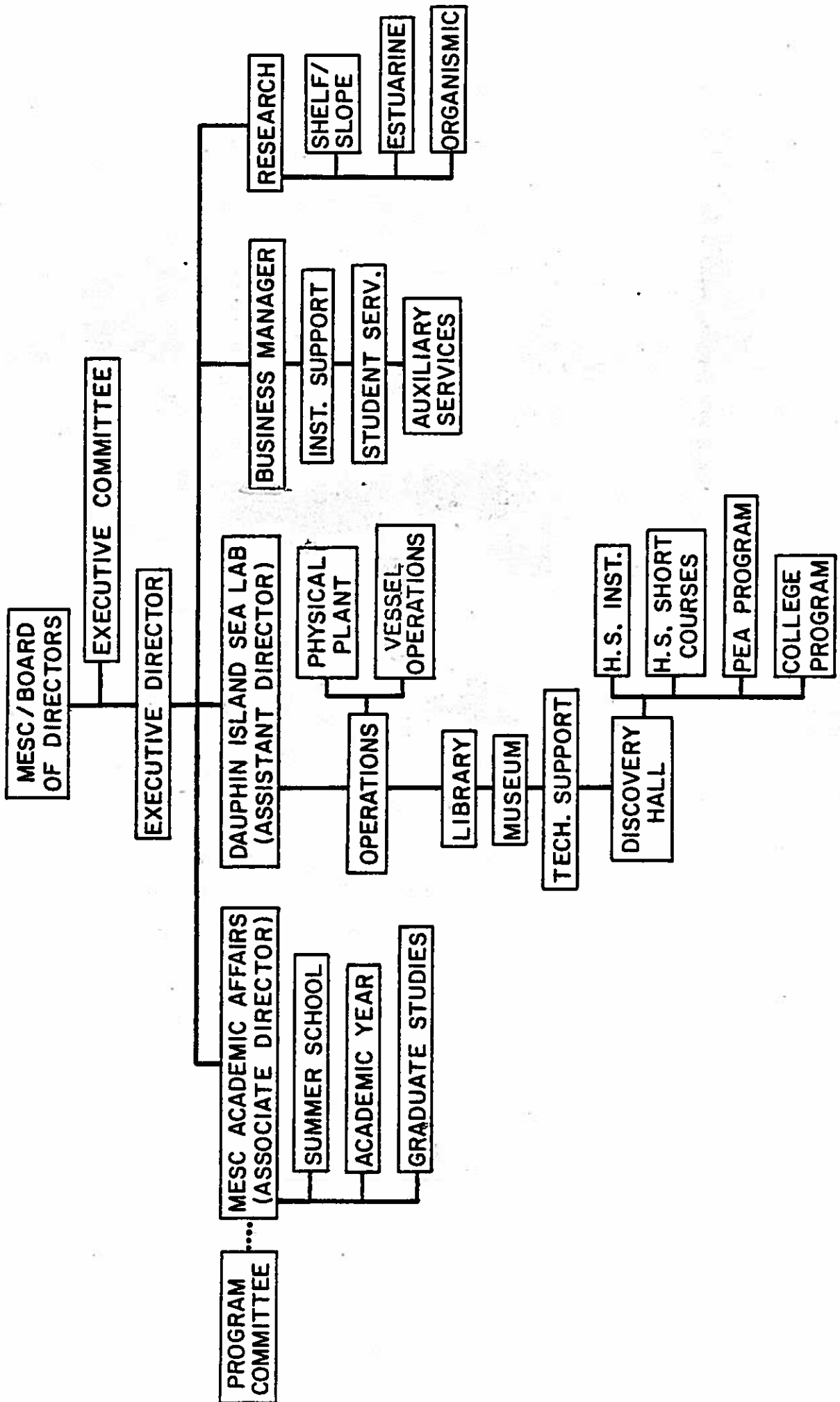
The long vacant line item at UAB has been filled by Dr. Robert Dean from Duke Marine Laboratory (Appendix C). He is expected to join the DISL faculty on January 1. Dr. Doug Clarke, Research Associate, who has directed the artificial reef assessment for several years has accepted a post with the Corps of Engineers' Waterways Experiment Station (WES). Dr. Eldon Blancher has been named a DISL Research Associate and also assigned to WES on an interpersonnel agreement.

The activities of the resident faculty are varied and overlap in the different programmatic elements of consortium activities. These are summarized in Table 17.

Table 17. Faculty Activities

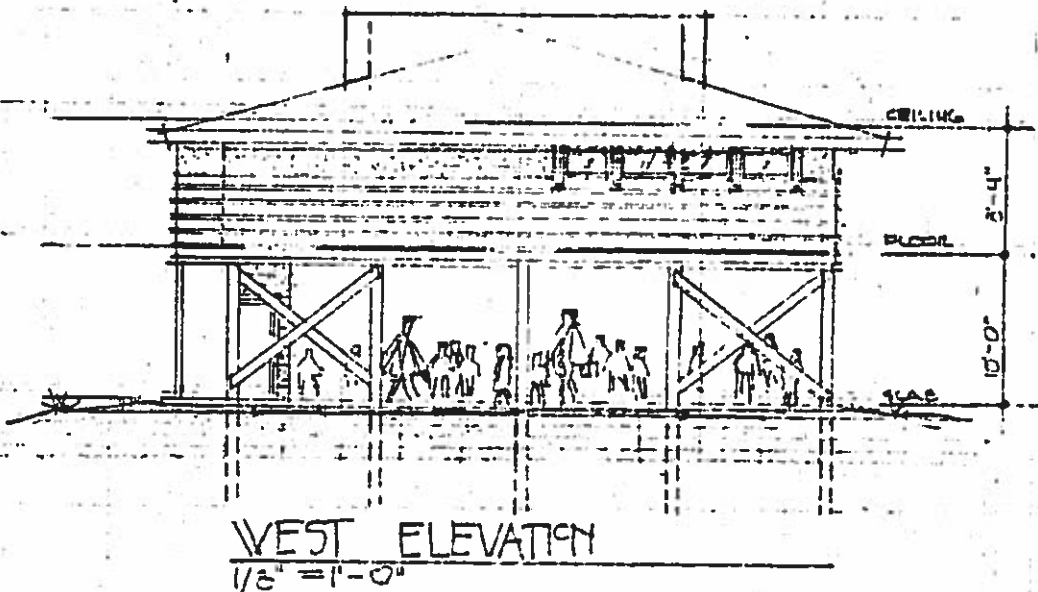
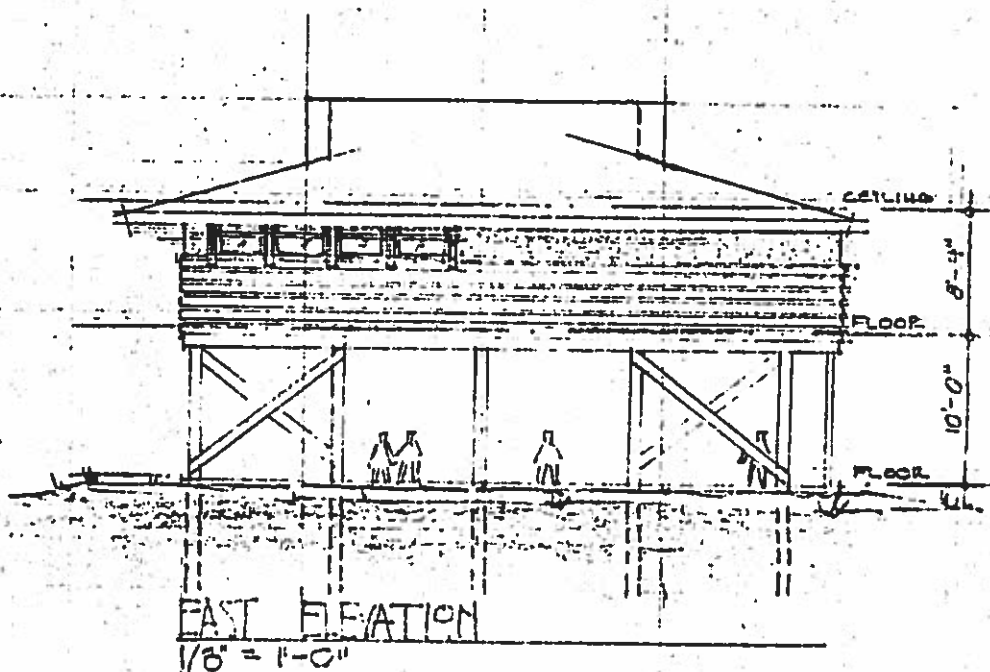
	<u>INSTRUCTION</u>	<u>RESEARCH/CONTRACTS</u>	<u>PROFESSIONAL ACTIVITIES</u>
Crozier, G. F. Assoc. Prof Biochemistry - USA	4 - MS Candidates 2 - PhD Candidates Tech Methods I & II Discovery Hall	Turbidity Study - Theodore (USCOE) Environmental Assessment (USF & M) Theodore Baseline Coordinator (USCOE) Reef Monitoring (MESC) Oiled Bird Workshop (MASGC) Study Plan - Coastal Area (CAB) Slipper Lobster Utilization (MASGC)	Member - Coastal Area Board, Ala., Auburn Coop. Ext. 10 yr. study group; Chairman, Coastal Environmental Education Council; MESC - Staff Council, Library Committee Diving Safety Board, MSP - Director
Hopkins T. S. Professor Biology - UA	12 - MS Candidates Discovery Hall	Florida Middle Grounds - (BLM) Theodore Baseline (USCOE) Discharge Info. Grid (CAB) Museum Interns (MASGC)	3 publications Director, Invertebrate re- pository; MESC - Staff Council, Library Committee, Vessel Operations Committee 5 BLM Cruises; 2 CAB Cruises, Search Com- mittee, UAB Biology; Consultant to CAB
Ivester, M. S. Associate Prof. Biology - UA	8 - MS Candidates 1 - PhD Candidate Benthic Community Struc- ture Marine Biology (UA Campus) Marsh Ecology Summer Seminar Discovery Hall	Marsh Management (MASGC) FNG meiofauna (T.S.H.)	2 publications, Assoc. Editor, MEGS, Coord- inator, DISL Graduate Studies, MSP Advisory Committee (UA), Search Committee, UAB (Bio- logy); Manuscripts reviewed: 2 - Estuarine Coast, Mar. Sci., 1 - J. Exp. Mar. Biol. Ecol., Secretary Treasurer, Gulf Estuarine Research Society, Estuarine Research Feder- ation; Consultant to Southwest Research Inst. MESC - Staff Council
W. W. Schmeder Assoc. Prof. Biology - UA	10 - MS Candidates Intro. To Oceanography Special Topics Discovery Hall	Theodore Baseline (USCOE) Florida Middle Grounds (BLM) Reef Monitoring (MESC)	4 Publications, MESC - Vessel Operations, Diving Safety Board, Staff Council, MSP - Advisory Committee (UA), UA - Aquatic Biology Program Committee, Meteorology of the Coastal Zone (Am. Met. Soc), Papers 2 at Symposium on the Natural Resources of the Mobile Estuary, May 1979, Meetings - Intl. Symp. on Effects Enrichment in Estuaries, Liaison with COE
R. L. Shipp Professor Biology - USA	11 - MS Candidates 40 - U/G Systematic Ichthyology Marine Zoogeography Fishery Biology Marine Biology	Theodore Baseline (USCOE) Slipper Lobster Utilization (MASGC) Longlining Project (MASGC) Snapper Tagging Project (Mob. Found.)	5 Publications, Pres. SE Division Am. Assoc. Ichthy. and Herp., Editor - MEGS, MASGC ad- ministrative Council, Chairman, Al. Council Special Scientific Committee- Gulf of Mexico Fisheries Council, MESC - Associate Director for Academic Affairs, Executive Committee, Program Committee; Papers - ASB, Mobile Bay Symp., Am. Soc. Ichthy. and Herp.
J. P. Stout Assistant Prof. Biology - USA	Marine Botany Marsh Ecology Discovery Hall	Marsh Management (MASGC) Theodore Baseline (USCOE) Biol. Study Plan (CAB) Library Development (HEM)	2 Publications, Assist. Director, DISL, Editor, GERS Newsletter, Ala. Editor, Natl. Mar. Ed. Assn. Coastal Environm. Ed. Council, Coordinator, Audubon Workshop, Coordinator, MESC Library Services, Mar. Ed. Mat. Syst.; Manu- scripts reviewed - 2 - MEGS, 2 - Estuaries, 1 - Gulf Research Reports, Papers/meetings - Intl. Mar. Sci. Libraries and Info. Centers (Woodhole) Mobile Bay Symposium Intl' Symp. on the effects of Nutrient Enrichment in Estuaries, Liaison - CAB

APPENDIX A
ORGANIZATIONAL CHART OF MESC



APPENDIX B

DESIGN OF NEW INSTRUCTIONAL BUILDING



PHIN ISLAND SEA LAB • JUNE 12, 1979

MA

3 OF 3

APPENDIX C
NEW FACULTY VITAE

Eldon C. Blancher, II - Research Associate DISL

Degrees:

B.A., Biology. University of New Orleans (UNO)	June 1972
M. S., Zoology. Louisiana State University (LSU)	December 1974
Ph.D., Environmental Engineering Sciences. University of Florida (UF)	March 1979

Title of M.S. Thesis:

"Diel and Seasonal Movements of Fishes in Little Lake, St. Tammany Parish, Louisiana."

Title of Ph.D. Dissertation:

"Lake Conway, Florida: Nutrient Dynamics, Trophic State, Zooplankton Relationships."

Positions Held:

1978-Present. Principal and Executive Officer, Taxonomic Associates, Inc.

1978-Present. Project Manager for Report Preparation and Data Analysis on Lake Okeechobee Limiting Nutrient Contract with Sugar Cane League. P.L. Brezonik Principal Investigator.

1976-1978. Coordinator of field operations for collection of phytoplankton, zooplankton, benthic invertebrates and associated water quality parameters on departmental contract with Corps of Engineers. Also developed hydrologic-nutrient systems model. J. L. Fox, Principal Investigator.

1975-1979. Graduate Research Assistant, Department of Environmental Engineering, UF.

1974-1975. Sporting Goods Manager-Buyer, Sportman's Paradise Inc., Slidell, Louisiana.

1973-1974. Trawl survey of estuarine fishes. Master's work.

1973. R/V Knorr cruise #35, first leg, November 1973, Woods Hole Oceanographic Institute, Woods Hole Massachusetts. Trawl survey of the fauna of Hudson Canyon, North Atlantic Ocean. Dr. R. L. Haedrich, Chief Scientist.

1972-1974. Graduate Teaching Assistant, LSU. Taught comparative anatomy and general biology laboratories.

Other Skills: Computer programming (Fortran, CSMP, SAS, BMDP, Basic), Photography, SCUBA

Consulting Experience:

- June 1978. Lake Seminole Survey, Zooplankton Taxonomy and Ecology. U.S. Army Corps of Engineers Mobile District. Water and Air Research Inc., Gainesville, FL.
- Jan-August 1978. Lake Roseau Survey, Florida Power and Light Contract. Zooplankton Taxonomy and Ecology. Environmental Science and Engineering, Inc., Gainesville, FL.
- May 1978. Founded Taxonomic Associates Inc. President-Owner.
- May-September 1977. Southwest Florida Estuarine Survey (208). Zooplankton Taxonomy and Ecology. Environmental Science and Engineering Inc., Gainesville, FL.

Publications:

1974. Abundance, Diversity and Distribution of Fishes in a Louisiana Estuary. ASP Bulletin. 21 (2):209. (abstract).
1976. Biological Baseline Studies of the Lake Conway, Florida, System. Interim Report to Waterways Experimental Station, U.S. Army Corps of Engineers, Vicksburg, Mississippi. Misc. Paper A-77-3. (Co-author).
1977. Biological Baseline Studies of the Lake Conway, Florida, System. Second Annual Report to the Waterways Experimental Station, U.S. Army Corps of Engineers. In press. (Co-author).
1977. Nitrogen and Phosphorus Loading Characteristics of the Lake Conway, Florida, Ecosystem. Preliminary Report to the Waterways Experiment Station, U. S. Army Corps of Engineers. In press.
1978. Nitrogen and Phosphorus Loading Characteristics of the Lake Conway, Florida, Ecosystem. Final Report to the Waterways Experiment Station, U.S. Army Corps of Engineers. In preparation.
1979. Determination of Nutrient Limitation in Lake Okeechobee, FL. Final Report to the Florida Sugar Cane League. In preparation. (Co-author).

Pepers Delivered:

1974. Abundance, Distribution and Diversity of Fishes in a Louisiana Estuary. Meeting of the Association of Southeastern Biologists, Savannah, Georgia. April, 1974.
1974. Abundance, Distribution and Diversity of Fishes in Little Lake, St. Tammany Parrish, Louisiana. Meeting of the Louisiana Academy of Sciences. Lafayette, Louisiana. April, 1974.
1976. Biological Baseline Studies of the Lake Conway, Florida System. Meeting of the U. S. Army Corps of Engineers Aquatic Plant Control Research Program. Atlantic Beach, Florida. October, 1976.

1977. Lake Conway Project; Nutrient Budget Considerations. Meeting of the Corps of Engineers Aquatic Plant Control Research Program. New Orleans, Louisiana. October, 1977.
1978. Nitrogen and Phosphorus Loading Characteristics of the Lake Conway, Florida, Ecosystem. Meeting of the Florida Academy of Sciences. April, 1978.
1978. Zooplankton-Trophic State Relationships in Some North and Central Florida Lakes. Meeting of the American Society of Limnology and Oceanography. Victoria, British Columbia. June, 1978. (Poster Session).
1979. Nutrient Loading--Trophic State Dynamics of the Lake Conway, Florida, Ecosystem. American Society of Limnology and Oceanography, Winter Meeting, Corpus Christi, Texas. January, 1979.

Dr. Robert Coulson Dean

A.B., Harvard University, 1979
 Ph.D., Zoology, Duke University, 1975

Positions:

Investigator, Office of Naval Research Contract No. N00014-75-C-0190 to Duke University 1971-1974.
 Research Associate, Department of Medicine, Duke Medical Center, 1975-1976
 Consultant, Woodward-Clyde Consultants, Clifton, N.J., 1976
 Assistant Professor, Biology, Kenyon College, 1976-
 Principal Investigator, Office of Naval Research Contract No. N00014-77-C-0477 to Kenyon College, 1977-

Grants and Awards:

National Science Foundation Traineeship, 1969-1971
 Office of Naval Research Contract No. N00014-75-C-0190, 1971-1974
 Office of Naval Research Contract No. N00014-77-C-0477, 1977-

Teaching Experience:

Teaching Assistant, Introductory Biology, Duke University, 1970-1971
 Guest Lecturer, Animal Diversity, Department of Zoology, Duke University 1972, 1973, 1975
 Science Fiction Seminar, Duke University House course, English Department sponsorship, 1976
 Population Biology; Experimental Population Biology, Kenyon, 1976-1977
 A Biological Perspective, Kenyon, 1976-1977, 1977-1978, 1978-1979
 Introduction to Experimental Biology, Kenyon, 1977-1978, 1978-1979
 Introduction to Biology, Kenyon, 1977, 1978
 Biology Honors Seminar, Kenyon, 1977
 Guest Lecturer, Comparative and Evolutionary Biochemistry, Duke University Marine Laboratory, Summer, 1978
 Marine Biology, Kenyon, 1979

Professional Associations:

American Association for the Advancement of Science, 1969-
American Society of Zoologists, 1977-

Other Professional Activities:

Research lectures delivered:

Department of Biology, Kenyon College, 1976
Department of Zoology, Ohio Wesleyan University, 1977
Duke University Marine Laboratory Summer Lecture Series, 1978
Horn Point Environmental Laboratories, University of Maryland, 1978.

Colloquium on Cellular Interactions in Symbiotic and Parasitic Associations,
Ohio State University, Fall, 1978.

Administrative Activities:

Campus Senate, 1977-1978
Secretary, Faculty Affairs Committee, 1978-1979
Biology Lecture Series, 1977-1979
Secretary, Science Division, 1978-1979

Community Activities:

Thursday evening group, 1976
Research lecture in the Biology Lecture Series, 1976
Panel discussion on the future of technology, Freshmen Orientation,
Fall, 1977
Panel discussion on the impact of technology, sponsored by Bedrock,
Fall, 1978
Introduction to "The Women", film shown during Women's Work Week,
Rosse Hall, September, 1977.
Workshop on Advising, Smythe House, Spring, 1978
Faculty Advisor, Environmental Committee
Faculty Advisor, Bedrock
Member, Kenyon Martial Arts Club
Faculty Advisor, Psi Upsilon fraternity

Papers Delivered:

Cellulose and wood digestion in the marine mollusk Bankia gouldi Bartsch.
Third International Biodegradation Symposium, Kingston, R. I., 1975

Suspension feeding in the shipworm Bankia gouldi (Mollusca; Bivalvia).
(with Geoffrey G. Back). Delivered to the American Society of
Zoologists, Toronto, Canada, 1977. Amer. Zool. 17: 948 (1977).

Amino acid absorption and assimilation in the shipworm Bankia gouldi
(Stewart, M. G. and R. C. Dean). To be delivered to the American
Society of Zoologists, Richmond Va., 1978. Amer. Zool. 18: 000
(in press).

Reports and Publications:

Digestion of cellulose and wood in the shipworm Bankia gouldi Bartsch. (Doctoral dissertation, Department of Zoology, Duke University, Durham, N.C., 1975). Also submitted as final report, ONR Contract No. N00014-75-C-0190.

Cellulose and wood digestion in the marine mollusk Bankia gouldi Bartsch. Biodeterioration of Materials, vol. 3, pp. 955-965. (Applied Science Publishers, Essex, 1976).

Mechanisms of wood digestion in the shipworm Bankia gouldi Bartsch: enzyme degradation of celluloses, hemicelluloses, and wood cell walls. Biological Bulletin, 155, 297-316 (1978).

Amino acid absorption and assimilation in the shipworm Bankia gouldi. (Stewart, M. G. and R. C. Dean). Submitted for publication to J. Exp. Biol.

Suspension feeding in the shipworm Bankia gouldi. In preparation.

Publications:

- Ivester, M. S. 1980. The Distribution of Meiobenthic Copepods along a Sediment Gradient. *Bull. Mar. Sci.*, 30 (3):
- Ivester, M. S. and J. C. Harp. 1978. Effect of Marshland Fires on Meiofauna Community Structure. *Amer. Zool.* 18(3): 661 (abstract).
- Ivester, M. S. Benthic Meiofauna Distribution in the Eastern Gulf of Mexico (in preparation for *Northeast Gulf Science*).
- Ivester, M. S. Analysis of Meiofauna from Three Alabama Gulf Coast Marshes (in preparation).
- Hopkins, T. S., and T. B. Scanland. 1978. A Supplemental Description of Pinnixa Tomentosa and Comparison with the Geographically Adjacent Pinnixa Tubicola (Brachyura, Pinnotheridae). *Proc. Biol. Soc. Wash.* 91 (3), pp. 636-641.
- Hopkins, T. S. and R. L. Shipp. 1978. Physical and Biological Observations of the Northern Rim of The De Soto Canyon Made From A Research Submersible. *Northeast Gulf Sci.* Vol. 2 No. 2, p. 113-121.
- Schroeder, W. W. Dispersion and Impact of Mobile River System Waters in Mobile Bay, Alabama. *Water Resour. Res. Inst. Bull.* 37, Aug. 1979.
- Schroeder, W. W. 1978. Meteorological Data Summary, Dauphin Island. (With Others). Dauphin Island Sea Lab Technical Report No. 79-001, July 1979.
- Schroeder, W. W. Hydrography and Circulation of Mobile Bay. (With W. R. Lysinger). *Proced. Mobile Estuary Symp.*, May, 1979 (In Press).
- Schroeder, W. W. The Dissolved Oxygen Puzzle of the Mobile Estuary. *Proced. Mobile Estuary Symp.*, May, 1979 (In Press).
- Shipp, R. L. Physical and biological observations of the Northern Rim of the DeSoto Canyon made from a research submersible. 1974. *Northeast Gulf Science* 2(2): 113-121, with T. S. Hopkins.
- Shipp, R. L. Taxometric analysis of Demersal fishes of the northern Gulf of Mexico. 1979. *Ambio. Special report on Deep Sea Biology*, with 3 others.
- Shipp, R. L. Notes on life history of the finetooth shark Carcharhinus isodon, in the northern Gulf of Mexico. In press. *Fishery bulletin*, with S. A. Branstetter.
- Shipp, R. L. Summary of knowledge of forage fish species of Mobile Bay. In press. *N. F. W. S. Symposium on Mobile Bay*.

Stout, J. P., A. A. de la Cruz and C. T. Hackney. 1979. Net Primary Productivity of Four Gulf Coast Marsh Communities in Artificially Fertilized Plots. Proceedings: International Symposium on the Effects of Nutrient Enrichment in Estuaries, May 29-31, 1979, Williamsburg, Va. (In Press).

APPENDIX E
CONDITION OF ACCOUNT, MESC FY 1978-1979

M E S C

Marine Environmental Sciences Consortium

DAUPHIN ISLAND SEA LAB
P. O. BOX 386
DAUPHIN ISLAND, ALABAMA 36528
TELEPHONE 205-861-2141

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The University of Alabama,
Tuscaloosa

JAMES F. VICKREY, JR.
University of Montevallo

ROBERT M. GUILLOT
University of North Alabama

October 24, 1979

Condition of Account, MESC FY 1978-1979

Bank Balance forward 9/30/79 5,641.37

Total Income	852,237.24
Total Expenditures	(756,407.66)
Accounts Receivable	94,188.98
Payable to USA	(30,000.00)
Encumbrances	(7,593.58)
Restricted funds	(32,452.31)
Petty Cash	500.00
USFW Receivable	950.75

To 1979-80 ... \$127,664.79

	Credit	Debit
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Bank Balance 9/30/79	101,470.95	
Accounts Receivable	94,188.98	
USA Payable		30,000.00
Encumbrances		7,593.58
Petty Cash	500.00	
COE Restricted		4,380.02
CAB Restricted		27,815.48
HEW Restricted		256.81
USFW Receivable	950.75	
	<u>197,110.68</u>	<u>70,045.89</u>

