

**JUDY STOUT**

**DAUPHIN ISLAND SEA LAB**

**SPECIAL REPORT**



**REPORT No. 88-001**

**ANNUAL REPORT 1986-1987**

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

## Director's Preface:

The dedication of the first truly new research facility at the Sea Lab, the experimental wet laboratory, concluded one of the most active periods for the Consortium and the Sea Lab on just the right note. With this laboratory the institution finally has the ability to house living marine species under controlled conditions.

This project was successful because of donations from the U. of South Alabama and Auburn University in the form of cash and equipment. We are deeply indebted to these institutions.

This was also a year of growth in our graduate studies program. After the "no-growth" period dictated by the "no-bridge" years in the aftermath of Hurricane Frederic we are seeing a return to levels of active graduate student participation that reflect a successful program.

This has been made possible in part by continued generous contribution from the Mobil Foundations Inc. and Shell Companies Foundation. The cumulative total donated by these two oil company foundations reached a total of over \$58,000 this year and their effort is directed entirely to our graduate studies fund established by Dr. Schroeder. These two benefactors were joined in 1987 by QMS, Inc., a Mobile-based high technology firm, which donated a laser printer to our computer center. This has greatly improved the visual quality of our products including portions of this report. These donations from the private sector are much appreciated and provide much-needed support in areas which are most meaningful.

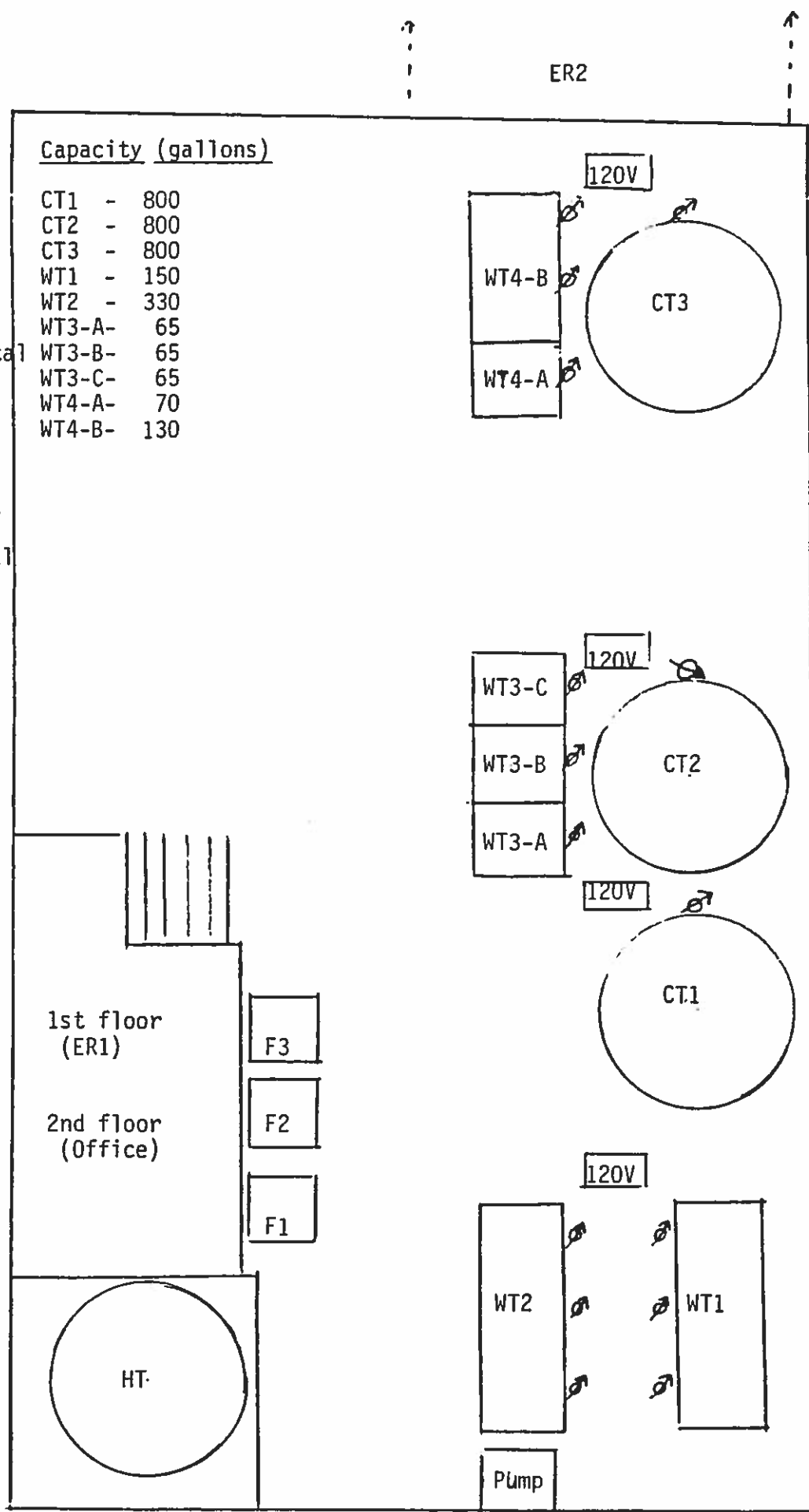
My final comment is to speculate that the summer program, which was the largest in MESC history, may have been the largest marine educational effort in the country last year.

Figure 1.

- - Circular Tank
- - Water Table
- ⌋ - Environmental Control Room
- ▭ - Head Tank
- ▭ - Filter Tank
- 120V - Electrical Outlet

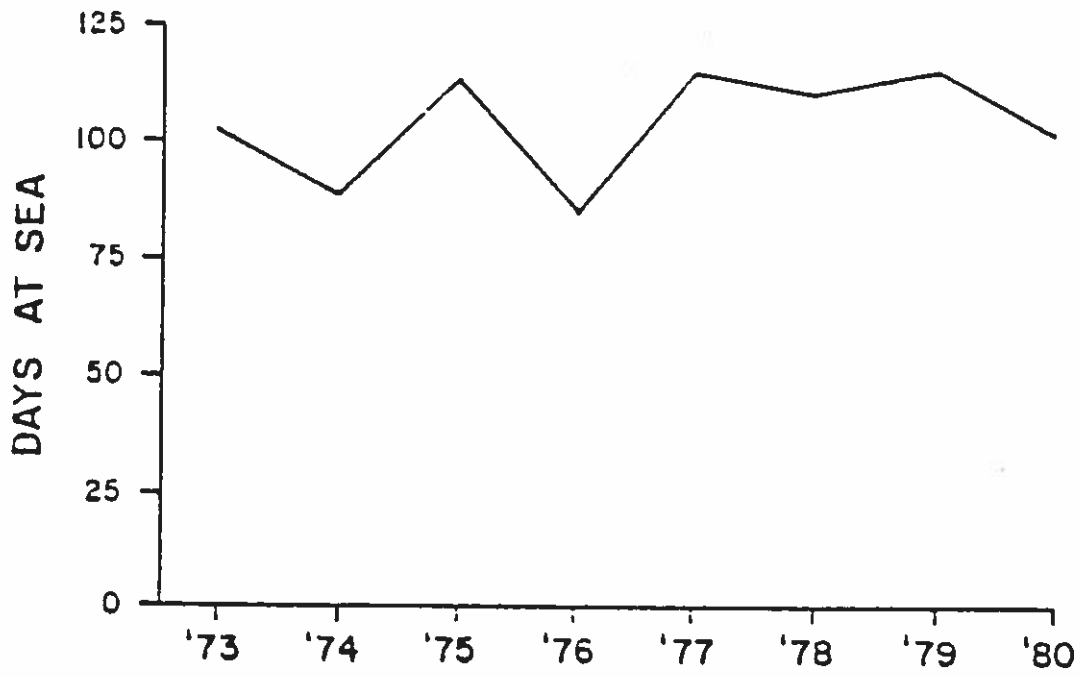
Capacity (gallons)

CT1	-	800
CT2	-	800
CT3	-	800
WT1	-	150
WT2	-	330
WT3-A	-	65
WT3-B	-	65
WT3-C	-	65
WT4-A	-	70
WT4-B	-	130

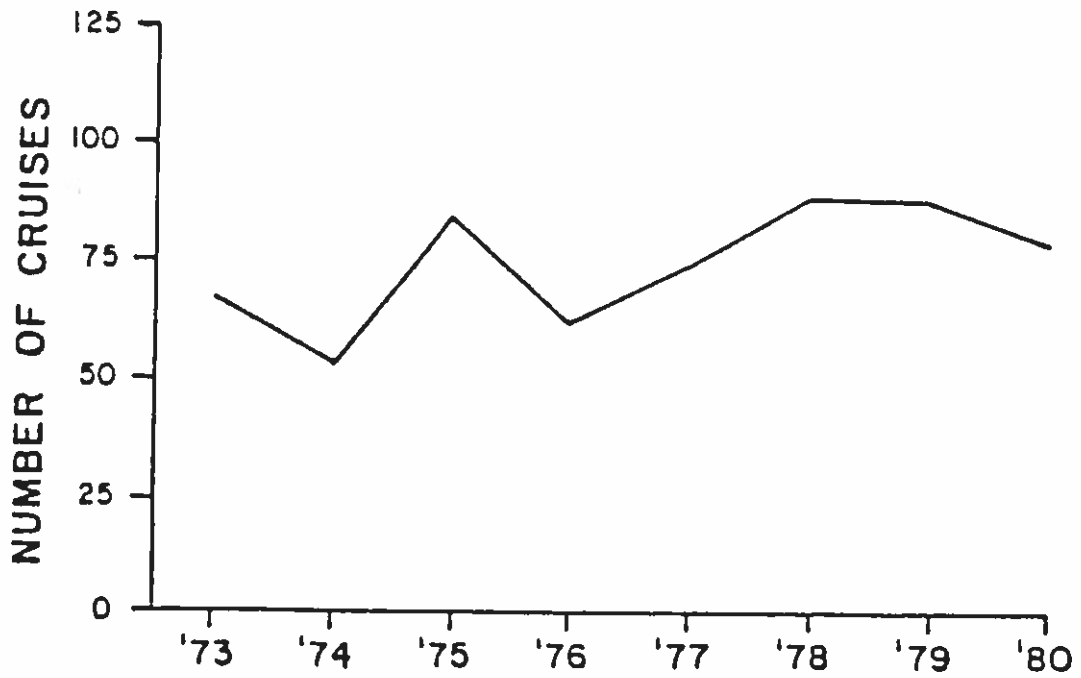


North →

Figure 2.



R/V G.A. Rounsefell Days at Sea



R/V G.A. Rounsefell Number of Cruises

Table 1.

VESSEL: A. E. Verrill  
Utilization Breakdown

YEAR	1985-1986	1986-1987
Total days at sea	35	95
Total cruises	34	97
Educational cruises	24	52
MESC/DISL	23	35
Others:	1	17
Research Cruises	6	40
MESC/DISL	2	26
Others:	4	14
Miscellaneous Cruises	4	1
Cruise Length		
Day (0-8) hours	28	88
Extended Day (up to 24 hours)	5	7
Multi-day (24 or more)	1	2
Total number of participants	595	1643
Total Nautical miles	1455	3114
Man hours at sea	3737	8971
Man days at sea	156	374

## Computer Facilities

### Computer Facilities

The Lab operates two TeleVideo TS806/20 computer systems with seven work stations for data and word processing. New IBM compatible computers and peripherals have been purchased over the past couple of years to take advantage of new scientific and graphics/publishing software. The Lab also utilizes computing facilities at the University of South Alabama and the University of Florida at Gainesville.

## INSTRUCTION

### A. DISCOVERY HALL PROGRAM

The Discovery Hall marine science programs for K-12 have grown yearly. This year programs were delivered to 3591 students (Table 4). Ninety-one percent of which were from Alabama. It was unfortunate that we received more requests for programs than could be handled by Discovery's personnel. Approximately 50 teachers representing 1200 students were turned away. Discovery Hall received formal support from Governor Guy Hunt and the State School Board, through resolution No. I-2-E, in March 1987, that recognized the Discovery Hall Program as a entity of the state education system and recommended that teachers attending Discovery Hall workshops receive professional development credits for the participation. Due to the combined effort of the Governor's office, the state board and the demonstrated need, the legislature has funded one new position and two graduate assistantships for Discovery Hall in 1987-88.

The 1987 summer institute increased enrollment by 57% (Table 5.) and attracted students from 8 states other than Alabama.

Over the years Discovery Hall has had good media coverage from local and state newspapers and magazines. This year an article in Southern Living describing Discovery Hall resulted in hundreds of inquiries.

Ms. Jenny Cook (Discovery Hall instructor) and Dr. George Crozier wrote 8 curriculum resource units entitled "Coastal Concepts" for 7th and 8th grade teachers. This project funded by the Alabama Department of Economic and Community Affairs infuses coastal marine concepts through content material, laboratory, and field experiences into the teachers' existing plan of study. Teacher workshops have been scheduled for this year to instruct the teachers in the use of these units.

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Table 4. Summary of Discovery Hall utilization, October 1986 - September 1987

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Day Programs for Elementary Schools	2136
High School In-State	1120
High School Out-of-State	314
College Programs In-State	470
College Out-of-State	32
Summer High School Program	44

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The Summer colloquium series (Appendix I) was again successful. Dr. Shipp provided financial support for the series through the Coastal Research and Development Institute at USA.

### C. Graduate Studies:

The Graduate Studies Program conducted at the Sea Lab is an academic service provided to the 9 MESC schools offering graduate degrees. Enrollment in the program is a function of the recruitment success and admissions of the membership. During the academic year (non-summer) MESC offers a curriculum of graduate courses on a two-year rotation. Courses are scheduled on an academic quarter basis. Registration is open to all graduate students.

Four graduate courses were offered at the Sea Lab during the 86/87 academic year, providing 34 student enrollments for a credit hour total of 180 quarter hours (Table 6.). This is one of the largest academic year programs conducted by the Consortium. Students from four schools were enrolled (AU, UAB, UAH, UAT, USA). Instructors were all resident faculty at the Sea Lab (Heck, Hopkins, Schroeder, Shipp, Stearns and Stout). Sea Lab faculty supervised an additional 21 hours of directed research and thesis research.

Support for graduate students residing at and/or doing research at the Sea Lab has been a major objective of the Consortium. MESC support to graduate programs of the member schools includes student stipends, modest supply funds, housing subsidies and logistical or in-kind support such as technical personnel assistance, vessel and vehicle time, laboratory and office space and computer facilities. Students become eligible for support by obtaining Graduate Research Status (GRS) at the Sea Lab. Performance

Twelve students (3 Ph.D. and 9 MS), from three schools maintained GRS in 86/87 (Table 7). Nine were full-time at the Sea Lab and 3 made part-time use of resources and facilities. Three additional Masters students were admitted and will be seeking GRS in 1987/88.

A total of \$44,028 in MESC support and \$24, 758 from other sources was allocated to support of graduate students at the Sea Lab (Tables 8, 9). These totals do not include faculty salaries or teaching material designated for the graduate student program. Non-MESC support includes, in-part, extramural support to resident principal investigators, so part may also be viewed as MESC-generated.

The graduate program has been strong for years, averaging 3-4 graduates per year since its inception. Enrollment appears to be on an upswing with continued growth anticipated. Several efforts are currently being made to enlarge the available faculty of this essentially state-wide department by more actively involving the campus based MESC faculty. It should be noted, however, that support capabilities of the Sea Lab and resident faculty are near saturation and expansion of the graduate program will require specific increases in funding and on-site faculty as well as facilities modifications.

TABLE 8. Graduate student support - FY 86/87 breakdown by category and fund source.

	MESC	NON-MESC (1)
Computer	\$699.15	\$92.40
Copying	\$391.75 (2)	
Drafting	\$75.00	
Equipment	\$111.50	
Housing	\$1740.00 (2)	
Library	\$41.70	
Office/Lab Space	\$53.00 (3)	
Stipends	\$15,171.20	\$24,666.16
Supplies	\$204.61	
Technical Support	\$885.04	
Vehicles	\$1194.70	
Vessels	\$23,460.30	
Total	\$44,027.95	\$24,758.56

1. Includes NOAA, EPA, Sea Grant, USA, UAT
2. At student rates
3. At 1 unit per month, not cash value

## Research

The resident research staff held a retreat late in the winter quarter and addressed a reorganization of the research effort and identification of major goals and objectives. The group collectively organized themselves as a Research Committee and elected Dr. Ken Heck as chairman. Dr. Heck is preparing a 5-year plan for staffing and facility expansion.

After much discussion, the committee agreed that Benthic Ecology, in its broadest sense, would constitute the principal thrust of future activity. This was not intended to dismantle ongoing wetland, beach or organismic studies, but only to provide a focus for growth and academic expansion. The existing logistical and intellectual strengths of the laboratory clearly dictated such a decision.

As part of the initial planning stage, Dr. Crozier agreed to return the salary released by extramural funding to the principal investigators. At the moment, 20% is returned to an individual incentive account for professional development and 80% goes to a research pool which is controlled by vote of the research committee. Although only implemented in the last third of the year, over \$4000 accumulated in the research pool which will provide much-needed research equipment.

A need to provide greater involvement of campus-based researchers around the Consortium led to the creation of a liaison position with the MESC Program Committee. Dr. Ann Williams (AU) was elected to represent that group on the Sea Lab's Research Committee.

The emphasis on benthic ecology is properly reflected in the largest projects of the research program, the "Hardbottoms" study headed by Dr. Schroeder but involving Heck, Dindo, Dardeau from the Sea Lab and Dr. Al Shultz from the Geology Dept. at the U. of Alabama and the "Grassbeds"

and staff is being implemented in a cooperative investigation of the current status of the plant and animal populations shallow waters and mainstem of Perdido Bay. The study, being done in cooperation with Federal and state agencies (Alabama and Florida), is designed to lead to recommendations for effective management and preservation of the Bay's resource

Dr. Hopkins has continued to organize and review the extensive data base on the Mobile Bay benthic community. Mike Dardeau completed the first phase of a similar approach in Perdido Bay. Both are continuing the sample analysis from the ARI-sponsored Speckled Trout Study.

### **Seagrass Study**

Seagrasses are flowering marine plants with unusually high growth rates. These plants support an extraordinarily rich assemblage of associated animals, many of which are the juveniles of commercially and recreationally important species of fishes, shrimp and crabs. Three extramurally funded research programs are currently underway to evaluate the productivity of seagrass ecosystems in the northern Gulf of Mexico. The first study, carried out by Dr. Judy Stout, is aimed at measuring the growth and production of two common sea grasses (widgeon grass, Ruppia maritima, and shoal weed, Halodule wrightii) in Alabama waters. This work, being conducted in intertidal and subtidal grass beds is aimed at estimating how much organic matter is produced by the two plant species as a function of water depth. This work will also lead to a better understanding of the factors controlling the distribution and abundance of seagrasses.

A second study, carried out by Dr. Ken Heck, along with post-doctoral fellow Loren Coen, seeks to evaluate the effects of seagrass density and

Several species new to science have been described from MESC material in papers published this year. In addition, Charles Lutz has published an account of our museum information management system in *Curator*, a publication of the American Museum of Natural History.

RESEARCH PROGRAM 1986-1987

PROJECT	PI	FUNDING AGENCY	ONGOING	PROPOSED	COMMENTS
<b><u>SHELF PROCESSES</u></b>					
PLANKTON COMMUNITY INTERACTIONS	STEARNS	MESC NSF	X	X	
SEDIMENT TRANSPORT	SCHROEDER	MASGC	X		
HARDBOTTOMS	SCHROEDER HECK, DINDO DARDEAU	MESC/UAT MASGC	X		
ARTIFICIAL REEFS	DINDO/CROZIER	MESC GCCA/NFS	X	X	
BEACH PROCESSES	CROZIER	MESC ADEM/ADECA	X	X	INTERIM REPORT IN PREPARATION
<b><u>ESTUARINE PROCESSES</u></b>					
MOBILE BAY BENTHIC COMMUNITIES	HOPKINS DARDEAU	MESC ADEM	X X		
SEAGRASS FOOD CHAINS	HECK	NSF (EPSCoR)	X		
SEAGRASS FOOD CHAINS	HOPKINS ET AL.	ARI/MESC	X		COMPLETED FIELD COLLECTIONS ANALYSIS UNDERWAY
WEEKS BAY HABITATS	STOUT	NOAA	X		COMPLETED; REPORT IN PREPARATIO
WEEKS BAY NUTRIENTS	HOPKINS	NOAA	X		FIELD WORK COMPLETED, REPORT IN PREPARATION
WEEKS BAY HYDROGRAPHY	SCHROEDER	NOAA/MASGC	X		1ST YEAR REPORT COMPLETED
WEEKS BAY INDICATOR SPECIES	DINDO/MARION	NOAA	X		1ST YEAR REPORT COMPLETED
WEEKS BAY PLANKTON COMMUNITY INTERACTIONS	STEARNS	MESC/NSF/NOAA		X	
COASTAL ORNITHOLOGICAL STUDIES	DINDO/MARION	MESC/NON-GAME	X	X	
PROJECT	PI	FUNDING AGENCY	ONGOING	PROPOSED	COMMENTS
PERDIDO BAY BENTHIC		ADECA			COMPLETED, FINAL REPORT

APPENDIX 1  
ATTACHMENTS





# Dauphin Island Sea Lab



## 1987 Summer Colloquium Series

- Tuesday, June 16** Dr. Ken Able, Rutgers University.  
Ecology of Golden Tilefish: Submersible Observations in the Mid-Atlantic Bight and off Florida.
- Thursday, June 25** Dr. Frank Moore, University of Southern Mississippi.  
Behavior and Ecophysiology of Trans-Gulf Migrating Birds.
- Thursday, July 2** Dr. Al Shultz, University of Alabama.  
Perspectives in Shelf Sedimentology.
- Thursday, July 9** Dr. Bill Herrnkind, Florida State University.  
Behavioral Ecology of the Recruitment Phase of Spiny Lobster Larvae.
- Thursday, July 16** Dr. Larry Abele, Florida State University.  
Ecology and Zoogeography of the Anchialine (Landlocked-Tidal Pool) Crustacean Fauna.
- Thursday, July 23** Dr. Bill Kruczynski, EPA-Gulf Breeze.  
EPA's role in wetlands and estuarine protection.
- Thursday, July 30** Dr. Richard Hoover, NASA-Marshall Space Flight Center.  
Diatoms on Earth, Comets, Europa, and in Interstellar Space.
- Thursday, August 6** Dr. Sam Rogers, University of New Orleans.  
Evolutionary Genetics and Systematics of Fundulus.
- Thursday, August 13** Dr. Steve Bortone, University of West Florida.  
The Mosquitofish, a case for environmentally induced hermaphroditism.
- Thursday, August 20** Dr. Pete Sheridan, NMFS-Galveston.  
Shrimp Migrations in the Western Gulf of Mexico.

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**ALL COLLOQUIA ARE AT 4:30 P.M. IN DISCOVERY HALL**

*Co-Sponsored by the Dauphin Island Sea Lab  
and the  
Coastal Research and Development Institute of the University of South Alabama*

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September 1, 1987

Dr. George Crozier  
Dauphin Island Sea Lab  
P.O. Box 369-370  
Mobile, Alabama 36528

Dear Dr. Crozier:

Thank you for assisting in the International Paper Company Foundation's Workshop series, Learn by Thinking: A Problem-Solving Approach in Elementary Science. The field trips were an informative and enjoyable part of the week's activities, and contributed greatly to the overall success of the project. I appreciate your cooperation, and look forward to working with you again in the future.

Sincerely,

Lynette S. Gaines  
Associate Superintendent  
Educational Operations

LSG:egy

**Day Programs for elementary schools:**

Brownies	20
Daphne Elementary	45
John Will Elementary (gifted)	20
St. Vincent DePaul	17
Jackson Middle School	30
Davidson High School	40
Fairhope Elementary	30
Daphne Elementary	30
Meadowlake Elementary	39
Meadowlake Elementary	46
Kate Shepard	30
Kate Shepard	30
Spanish Fort	47
Kate Shepard	30
Dixon Elementary	42
Dixon Elementary	42
Dixon Elementary	42
Mobile College	11
Mobile College	11
University South Alabama	40
School Days Learning Center	37
Mobile Training School	50
Mobile Training School	50
Daphne Elementary	32
George Hall Elementary	56
Project Sea Oats (MCESS)	35
St. Ignatius	30
Council Elementary	50
Escambia Academy	16
J. T. Wright	36
Hollinger Island Elementary	51
Council Elementary	50
Dodge Elementary	31
Burroughs Elementary	69
UMS Kindergarten	42
UMS 5th	28
Nan Gray Davis	75
Nan Gray Davis	36
George Hall Elementary	45
Nan Gray Davis	41
Baker Elementary	192
Old Shell Road Elementary	46
Austin School	50
Meadowlake Elementary	56
Meadowlake Elementary	57
Dixon School	66
Lucedale Elementary	8
Dauphin Island School	15
Dixon School	60
Alberta Middle School	60
Total	2136

Auburn Architectual School	17	1
Mobile College	25	1
Birmingham Southern College	15	6
Birmingham Southern College	10	1
University South Alabama EPSCoR	12	1
Auburn - Biology	6	2
Auburn - Biology	20	2
University of North Alabama	10	3
University of Alabama -Birmingham	20	3
Tuskegee University	31	3
Birmingham Southern College	20	3
Jacksonville State University	18	3
Samford University	10	3
Gadsden State Community College	10	3
Livingston University	20	2
Shelton State Community College	15	2
Jacksonville State University	25	8
Troy State University	12	2
Auburn - Biology	15	2
University of Alabama - Birmingham	20	1
Auburn - Geology	4	30
Auburn - Biology	12	2

Total 470

**Out-of-State University - Colleges:**

Southwest Louisiana State - LA	5	1
Southwest Louisiana State - LA	9	1
University of Tennessee - TN	18	4

Total 32

**Service Organizations:**

Alabama Ornithological Society	50	2
Alabama Conservancy	25	2
Auburn Wildlife Society	28	2
Alabama Audubon Council	115	2
Alabama Association of Home Economists	53	1

Total 271

Other - Individuals using facilities for 1-5 nights on their own - 61

Mobile, AL	8
Saraland, AL	2
Grand Bay, AL	1
Montrose, AL	1
Homewood, AL	1
Daphne, AL	1
Elberta, AL	1
Troy, AL	1
Huntsville, AL	6
Birmingham, AL	5

APPENDIX 2  
PUBLICATIONS

## PUBLICATIONS

- Cook, J. V. 1987. Coastal Concepts: Curriculum Units for Seventh and Eight Grade. MESC Special Report 87-003.
- Crozier, George F. 1987. Climate Change and Coastal Resources: Papporteans Comments in Proceedings of the Symposium on Climate Change in the Southern United States: Future Impacts and Beach Policy Issues. Environmental Protection Agency.
- Dardeau, M. R. 1987. Studies on Perdido Bay. I. Structure of soft bottom benthic assemblages in Middle Perdido Bay. DISL Tech. Report 87-001.
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- Heck, K. L. Jr. Benthos. pp. 97-110 IN: Ecological studies in the Middle Reach of Chesapeake Bay: Calvert Cliffs, Maryland. K. L. Heck, Jr. (ed.). Springer-Verlag, New York, NY.
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- Heck, K. L. Jr. and K. A. Wilson. 1987. Predation rates on decapod crustaceans in latitudinally separated communities: A study of spatial and temporal variation using tethering techniques. J. Exp. Mar. Biol. Ecol. 107:87-100.
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- Stearns, D. E. 1986. Copepod grazing behavior in simulated natural light and its relation to nocturnal feeding. Mar. Ecol. Prog. Ser. 30:65-76.
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- Stearns, D. E., W. Litaker and G. Rosenberg. Zooplankton grazing impact on short-term changes in chlorophyll a concentration in estuarine waters. J. Alabama Acad. Sci. 58:74
- Stout, J. P. The ecology of Juncus roemerianus marshes in the U. S.: A review. Proc. Intntl. Wetlands Conf., June, 1986.
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- Wilson, K. L., K. L. Heck, Jr. and K. W. Able. Juvenile blue crab (Callinectes sapidus) survival: An evaluation of eelgrass as refuge. Fish. Bull. 85:53-58.