

Dauphin Island Sea Lab



Annual Report
1995 - 1996





Statement of Purpose

The Marine Environmental Sciences Consortium (MESC) is Alabama's marine research and educational institution.

Founded in 1971 by the Alabama legislature to maximize the marine sciences capabilities of several



Alabama institutions and minimize duplication, MESC includes twenty-two Alabama colleges and universities, both public and private. The administrative and operational base for MESC is the Dauphin Island Sea Lab.

The MESC and its faculty work toward the combined purpose of conducting pure and applied research, and sponsoring structured educational programs for individuals and organizations interested in and dependent upon the marine environment.

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Table of Contents

Statement of Purpose	1
Letter from the Director	3
Organizational Overview	4
Administration and Facilities	6
Academic Programs	11
Public Service	18
Estuarium Campaign Progress Report	20
Research Faculty Activity	22
Extramural Support	32
Board of Directors	33
Executive Committee	34
Program Committee	35
Member Schools	36
Finances	37



Aerial view of the Dauphin Island Sea Lab

*Photograph of R/V A.E. Verrill by Robert Dixon
Border photographs by Karen Estes
All other photographs by Lisa Young*



The R/V A.E. Verrill, Dauphin Island Sea Lab's 65-ft research vessel.



Dr. George F. Crozier, Executive Director

Letter from the Director

Twenty-five years!

What more needs to be said? The Air Force base was legally transferred to the Marine Environmental Sciences Consortium (MESC) on June 29, 1972, and physically handed over during a ceremony in July. The quarter-century of existence has been a period of federal downsizing, particularly in the arena of marine sciences and oceanography. This laboratory has effectively made progress against a falling tide and remarkable progress at that. Entering the anniversary year is a daunting challenge.

The first summer session was already underway in 1972 and the students attended the ceremony which was presided over by Dr. Frederick Whiddon, President of the University of South Alabama and Founding Chairman of the Board of Directors of MESC. Congressman Jack Edwards represented the administration of President Richard M. Nixon and the First District of the State at the event. This followed a wave of military base closures not unlike that recently carried out by the current administration. I doubt that anyone, especially myself, had any notion of the size and success that would be achieved by the transformed facility.

The reporting year has seen the closing of the Education Center after over a year of absolutely amazing performance. I would never have projected a visitation of over 30,000 "tourist-students" to the 1800-square foot facility. It was painful to shut it down, but the emergence of the Estuarium Exhibit Hall at the site is more than a little comforting. There has certainly been no more rewarding experience during my tenure as Director and the anticipation of the opening at the end of next year is almost unnerving. The generous support of the local business community has been most gratifying and bodes well for the future of the Lab.

The retirement of Dr. E. Roger Sayers as Chairman of the Board of Directors signaled the end of an era, as he was one of the Founding Directors of the Consortium. His personal support extended much further back — to the period of the University of Alabama's Marine Science Institute at Bayou La Batre. The University's generous and unwavering support was all that kept the Lab viable during the early years. Dr. Sayers' scientific background, remarkable insight and enormous patience made him a keystone within the evolving organization. His final action on our behalf was the establishment of an annual meeting of the Board of Directors! This seemingly simple event had eluded us for most of our quarter-century of existence.

Sincerely,

George F. Crozier, Ph.D.

Organizational Overview

The Marine Environmental Sciences Consortium (MESC) is technically referred to as a "public body corporate" having been established by the Alabama legislature in 1971 as Act. No. 2432. The not-for-profit corporation is virtually unique in the state as it is composed of twenty-two colleges and universities, the presidents of which make up the Board of Directors. The Board functions through an Executive Committee composed of nine institutional members on a three-year rotating memberships and three ex-officio members which includes the Executive Director as a non-voting member.

The routine interactions within the membership are handled through a Program Committee which has member institutions represented by a designee from each institution's president. This committee is an advisory group to the directorate of the Consortium, particularly in the area of academic program content. They are also responsible for the inclusion of the Consortium's course offerings in their respective academic programs. As such, they are the principal points of liaison between the Sea Lab and the member schools.

MESC owns and operates the only academic marine laboratory in the state at the site of a former Air Force radar base on the east end of Dauphin Island at the mouth of Mobile Bay. The 36-acre facility houses the administrative, teaching, research and logistical support units of the Consortium. The activities of the Consortium are all managed from the Dauphin Island Sea Lab, and the name has become synonymous with MESC and is considerably easier to remember. As the self-study confirmed the realization that "Dauphin Island Sea Lab" as a name and entity is much more recognizable than "Marine Environmental Sciences Consortium, Inc.," we have chosen to use DISL much more widely in our public communications.

Perhaps the most significant recommendation of the recently completed self-study was the creation of separate "departments" for marine education and research/university programs. This more effectively creates two separate faculties, each with a dramatically different mission statement and fundamental function. These roles will continue to evolve over time, but there are some central concepts that will remain constant.

The Consortium was originally established by the founding members to provide a summer field experience for their undergraduate science majors. The

majority of these were certainly biologists with an early sprinkling of geologists. There is little doubt that the marine sciences were the intended educational theme. The acquisition of qualified, productive faculty easily provoked the inclusion of graduate marine studies by those member institutions for which such activities are appropriate; conventionally referred to as the "research universities." This has become the cornerstone of the newly defined University Programs.

The advent of several K-12 programs remains somewhat shrouded in mystery. The participation by high school biology classes actually pre-dates the establishment of MESC and the Dauphin Island Sea Lab. But very early on, the field trips were supplemented by the summer residential program and an enthusiasm for exposure to the coastal environs. Although supportive, the Consortium has never pushed the development of marine sciences as a curriculum of its own, but rather advocated their inclusion as enrichment units within traditional courses of study. This approach is continued today as a mission of teaching science and mathematics using the marine environment and sciences as a means to that greater end. Further expansions in the areas of teacher training and public outreach constitute the future for the already well-recognized effort known as Discovery Hall Programs.

The chief financial officer of the consortium is a combination of the Comptroller for the consortium and the Business Manager of the Sea Lab. This individual is responsible for management of all institutional support functions, student services and auxiliary services, which include housing, food service and bookstore activities.

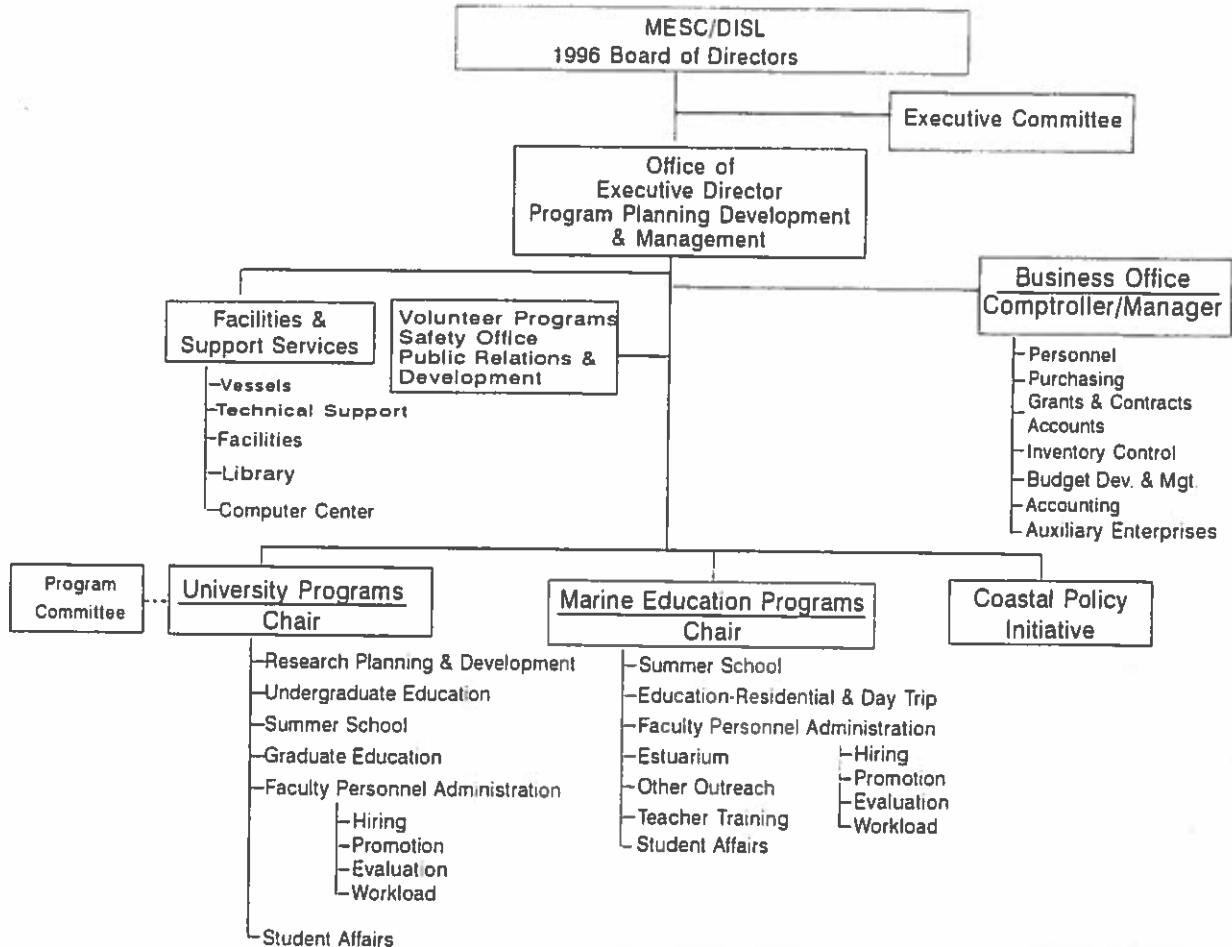
The line-item of the Associate Director of the Sea Lab has been eliminated and the role replaced by a high-level standing committee, the **Planning Council**. This group deals with the short and long-term planning, institutional research, budget review, and resource allocation. They are assisted in the process by the **Staff Council**, which is composed of the various staff and faculty department heads. This group has been particularly effective in providing a communication link between departments, allowing for cooperation and mutual support.

All of these administrative changes have been accompanied by a much more visible upgrade, that is, our new logo. The new logo was originally designed by Robert Dixon for the Estuarium and is intended to reflect the flow of the rivers of the State into Mobile Bay. It certainly captures well the maturity and diversification of science practiced at the Sea Lab, which ranges from fundamental biology



through biogeochemistry, oceanography and into bioengineering. Educational programs have become national models and among the largest in the country. The sphere of influence and activities has expanded throughout the Gulf of Mexico to the Caribbean and as far south as Antarctica. The faculties of research and education have

grown dramatically as reflected by the school of spadefish and the interaction of the living and non-living systems. All of these growth and expansion factors are well reflected in the new logo, at least as compared to the single spadefish, which remains as the key identifier of the Sea Lab and should never be lost.





Administration and Facilities

The Dauphin Island Sea Lab facility is located on 36 acres on the eastern end of Dauphin Island, a barrier island approximately three miles from the mainland and 40 miles south of Mobile, Alabama. The Sea Lab spans the island and thus has direct access to the Gulf of Mexico, Mississippi Sound and Mobile Bay. A bridge provides direct access to the island.

Four buildings located on the south campus provide over 9,000 square feet of classroom/laboratory facilities. The Marine Science Hall, the main research facility, contains over 7,000 square feet of research space, and 1,250 square feet of office space. The campus can accommodate over 160 persons in residence. Two dormitories, a two story efficiency apartment building with twelve units, ten 3-bedroom houses and a cafeteria provide quarters and meals for visiting faculty and students.

Unfortunately, the wet lab's roof fell victim to Hurricane Opal in 1995, and for much of the reporting year the lab was unavailable for use. A decision was reached by a faculty committee to repair the badly damaged building, and plans are currently underway for its renovation. Funds continue to be sought for this refurbishment. Included in the renovation plans are a raceway flume, a culture room for plankton, equipment and fittings for four recirculating systems, and many other innovative and necessary features for controlled experimental work on marine organisms.

Administration

With the restructuring of DISL's academic programs into Discovery Hall Programs (K-12) and University Programs (undergraduate and graduate levels), the Administration's staff composition has changed slightly from previous years. Aided by the Planning Council and the Staff Council, the Administration's duties and responsibilities have been well met by the recommendations set forth by the self-study.

Administrative Personnel

George Crozier, Executive Director
John Dindo, Chair, Discovery Hall Programs
Jonathan Pennock, Chair, University Programs
Georgia Mallon, Comptroller/Business-Auxiliaries Manager
Aleada Nicholson, Administrative Assistant to the Executive Director

Business/Finance

The Business Office of DISL operates under the principles of Fund Accounting set forth by the National Association of College and University Business Officers (NACUBO). MIP Fund Accounting system continues to meet the needs of the growing contracts and grants received by DISL faculty. Procedures, accounting records and policies of the DISL business office are audited annually by the State Examiners of Public Accountants.

Business/Finance Personnel

Georgia Mallon, Comptroller/Business-Auxiliary Manager
Donna Beasley, Purchasing Agent/Administrative Assistant
Lynn Bryant, Bursar/Report Specialist
Tiffany Cotton, Accounts Payable/Payroll
Rita George, Registrar/Student Services
Denise Keaton, DHP Registrar/Receptionist
Carolyn Wood, Faculty Administrative Assistant

Auxiliaries

Auxiliaries of DISL include the bookstore/gift shop, cafeteria, laundromat and vending machines. The cafeteria was renovated during the reporting period. Murals depicting an underwater seascape were painted by the DISL staff and docents; new tables were purchased; and indirect lighting was installed.

Auxiliary Staff

Beverly Tharpe, Supervisor
Anna Harbison, Assistant Supervisor

Computer Center

Faculty, students and staff have access to a variety of IBM-compatible and Macintosh computers in offices, labs and shared access areas at the Dauphin Island Sea Lab. Computer support personnel assist with installation and maintenance of computers, networks and peripherals, as well as software installation, support and training. The Computer Center also provides data processing services and maintains archive field and meteorological data. E-mail and Internet access are available via remote dial-up through the University of South Alabama and the local Free Net. A Dauphin Island Sea Lab Home Page is located at <http://sites.gulf.net/sealab>.

Computer Center Personnel

Randy Schlude, Computer Center Manager
Alma Wagner, Computer Technician

Library

The DISL library is highly specialized in the marine sciences, particularly those areas relating to the ecology and geology of the Gulf Coast region. With over 6,200 books and access to over 600 periodical titles, the Library's main focus has been on electronic automation. During the reporting period, the library staff downloaded over 5850 records onto the Master Library System, enabling searches by author, title, subject or keywords.

The library has a four-drive CD-ROM reader and four databases on CD-ROM, including WaterLit, Water Resources Abstracts, Aqualine, and Aquatic Sciences and Fisheries Abstracts.

Faculty and students now have access to a variety of on-line catalogs through the University of South Alabama's SouthCat system. The catalogs of Auburn, University of Alabama, Alabama State University, Jacksonville State University, University of Alabama at Birmingham, and University of North Alabama have been added, enhancing the ability of DISL staff to conduct on-line searches with these resources.

By obtaining an account with the Mobile Area Freenet, the library now also offers Internet and web access to faculty and students.

Early in the reporting period, the Network of Alabama Academic Libraries Advisory Council elected the DISL Library to Cooperative membership. This allowed for free interlibrary loans from participating NAAL libraries, and the Sea Lab staff took advantage of this privilege by doubling the number of interlibrary loan requests from 408 last year to over 800 this year. Membership also gives the library group leverage for negotiating prices for many different library data bases and services.

Library Personnel

Connie Mallon, Librarian
Todd McCullough, Library Assistant



Registrar Rita George (l) and receptionist Joyce Carroll (r) ready to greet visitors at the front desk.



Plant Operations

Plant Operations provide the maintenance, janitorial, vehicle and grounds upkeep for the entire facilities of the Dauphin Island Sea Lab.

This fiscal year saw much physical change on the grounds of the Sea Lab. A new Executive Director's office was built from a renovated 3-bedroom cottage; it now houses the Safety Office, the Docent Coordinator's Office, the Coastal Policy Program's Office, and the new Public Relations Office, as well as Dr. Crozier's office. A parking facility was constructed to accommodate these offices, as well as the cafeteria staff's needs.

Most of the buildings on campus benefited from a sorely needed re-roofing effort, including Endeavor, Discovery, Galathea, the Wet Lab, the former Technical Shop, Albatross, and 12 of the 3-bedroom houses, now used for both office space and visitors' quarters.

Dormitory facilities were improved by removing the "eyebrow" ledges from Challenger and Albatross, and new mattresses were installed in Beagle, Albatross and the visitors' cottages.

In the motor pool, a new 14-passenger van was purchased during the reporting period.

Plant Operations Personnel

Darrel Mallon, Plant Operations Supervisor
Wilton Barber
Jim Daves
Ricky Gibbs
Shirley Kirkpatrick
Dottie Mallon
Mary McLaughlin
Dennis Patronas
Theresa Porter
Steve Ruf
Ron Schuett
Russell Wilson
David Yommer

Safety Office

A Safety and Risk Management Office implements a lab-wide safety program through education of all the faculty, staff, and students. The effort is supported by a standing Safety Committee with representatives from each department.

The office provides CPR classes, first aid classes, and a Drug-Free Workplace Seminar in addition to carrying out a facility safety review by an independent consulting firm.

Late in the reporting period, Ms. Caldwell left the Sea Lab for a new position and the "local" oversight of safety issues was transferred to the department heads. The overall responsibility remains within the Director's Office.

Safety Personnel

Martha Caldwell, Safety/Risk Management Officer

Public Relations Office

As the scope of the Sea Lab has expanded dramatically in terms of its programs and services, so has the need to interface with an increasingly aware public. To this end, the Sea Lab hired a Public Relations Officer at the end of the fiscal year to facilitate media and community relations, as well as to promote the mission of the DISL locally, statewide, and nationally.

Faced with the challenge of promoting a variety of diverse programs, the Public Relations Officer will be responsible for a pro-active media agenda, including the writing, editing and layout of a number of DISL publications, as well as story placement in print and electronic media. The Public Relations Office will also coordinate internal communications and handle all in-coming media requests. MESC member institutions' public relations offices will now have an immediate contact within the Sea Lab. With the impending opening of the Estuarium and the celebration of DISL's 25th anniversary, as well as the responsibility of heightening public awareness of the DISL's educational and research mission, the Public Relations Officer will hit the ground running into the next fiscal year.

Public Relations Personnel

Lisa Young, Public Relations Officer

Technical Support

Technical Support provides faculty and students with information, technology, resources and services related to coastal research. Services include maintaining field instrumentation used to measure physical parameters and repairing standard laboratory equipment such as microscopes and balances. Advanced analysis of water samples is accomplished in a marine chemical instrumentation laboratory. In addition, a small but complete dive locker is maintained by technical support. The wet lab, damaged in last year's Hurricane Opal, was put back into limited service this year.

One of the most important functions of technical support is training students and other users to properly calibrate and utilize instrumentation in both the field and laboratory. By consolidating the logistics and instrumentation of marine research, technical support supplies academic programs with hardware, training and expertise.

In addition to supporting the Sea Lab faculty during this reporting period, the technical support team also aided the Weeks Bay National Estuarine Research Reserve in monitoring the dissolved oxygen levels, temperature, pH, and salinity in the waters of the Fish River and the Magnolia River.

Technical Support Personnel

Mike Dardeau, Marine Scientist
Jean Cowan, Marine Technician
Al Gunter, Marine Technician

Vessels

The DISL maintains two research vessels, the 65 ft. R/V *A.E. Verrill* and the 41 ft. R/V *Deborah B.* Additionally, the DISL owns and operates 6 smaller vessels, ranging from 12 to 26 feet. The table below is a breakout of the utilization of DISL vessels for 1995/96.

Captain Rodney Collier smoothly assumed the position of supervisor of vessel personnel during this reporting period, and oversaw numerous improvements on all the vessels. Among other improvements, the R/V *Verrill's* wheelhouse received a roof repair and a new A/C unit, as well as repairs on the compass and radar. The

Deborah B. had its top and bow-rail replaced, as well as a new anchor and life jacket boxes. Numerous improvements were made on the smaller boats as well.

Vessel days at sea (including 1/2 day operations):

<u>Vessel</u>	<u>93/94</u>	<u>94/95</u>	<u>95/96</u>
<i>A.E. Verrill</i>	112	97	87
<i>Deborah B.</i>	23	15	3
Small Boats	97	107	114

Vessel Personnel

Rodney Collier, Supervisor
Joe Sullivan
Russell Wilson



Vessel crew member Joe Sullivan hauls equipment on the R/V A.E. Verrill.

Academic Programs

Discovery Hall Programs

The Discovery Hall Programs offer a variety of learning experiences for all ages. Elementary students to senior citizens participate in field activities ranging from the measurement of coastal waves and currents to the exploration of salt marshes. Schools receive special lectures on marine careers and habitats. Workshops equip teachers to carry the "oceans" into their classrooms. It is through the Discovery Hall Programs that the Dauphin Island Sea Lab reaches beyond the scientific and higher education communities to promote good stewardship of the world's oceans.

Field and Lab Programs

The basis of the Discovery Hall Program...let's explore...please touch...ask lots of questions...is the hands-on approach to learning science. Discovery Hall educators lead students to salt marshes, beach walks, maritime forest explorations, and out on research vessels where all participate on hands-on learning. This unique ability to blend classroom activities with field or lab application results in a better understanding of the ecosystem, and how the field of science is applied. In the 1995/96 academic year, Discovery Hall delivered programs to 305 schools from 33 Alabama counties — in all, 11,472 students and teachers during the academic year, not including the summer program. In the months of September and October of 1996, the beginning of the new academic year, Discovery Hall educators presented programs to 1500 students. The Discovery Hall Program has some of the best and most dedicated marine educators in the United States, demonstrated by the continual requests for programs the DHP receives.

Outreach — BAYMOBILE

The staff of the Discovery Hall Programs and the members of DISL's Docent

Program offer and administer a traveling touch program known as "Baymobile." Baymobile is an exhibit that provides a marine educational experience to large, heterogeneous groups that are unable to visit the Sea Lab. It is sponsored in part by Exxon, Alabama Power Foundation, and the Kimberly-Clark Company. Baymobile is very much in demand and its visits include: Kid's Day in Bienville (12,000-15,000); Axis Community Day (900); Oyster Festival (700);



Marine educator Dana Roberts points out sights from the shore during a Beach Walk.

Coden Heritage Days (200); Earth Day in Mobile and Fairhope (1,100) and many more.

Community Service

The marine educators of the Discovery Hall Programs continue to participate in many Community Service activities. There are various community needs and interests that call for the special resources within the Discovery Hall Programs, and DHP attempts to meet all special interest requests when possible. Some 1996 Community Service activities were: Kids' Day in Bienville Park; Environmental Studies Day; judging county and regional science fairs; speaking at Griggs School's Career Day; serving on D.I. School's committee for SAC's Accreditation; speaking to Alba High School's Commercial Seafood Management Class; meeting with PACE groups; assisting with Girl/Boy Scout Badges; serving on an editing committee for Legacy's Water Sourcebook; and touch labs and face painting for the Dauphin Island Celebration and Mobil's Discovery Day at the Sea Lab.

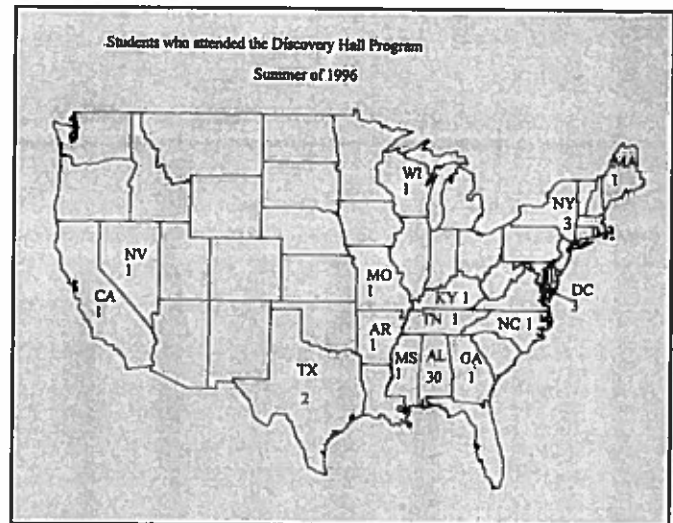
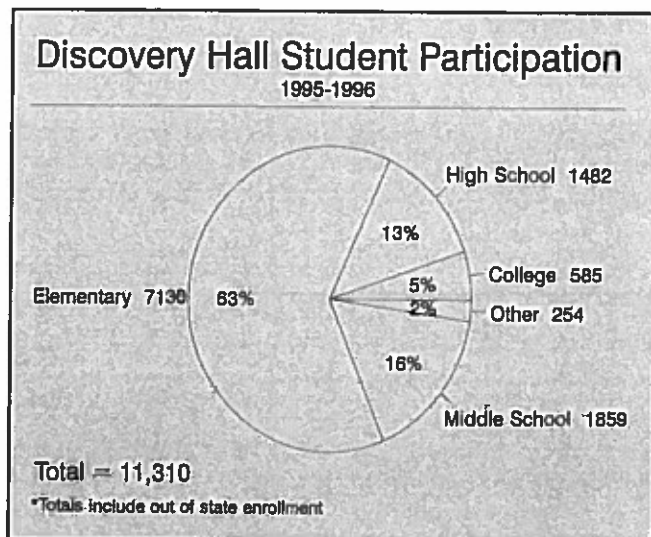
High School Marine Science Course

In addition to the field and lab programs offered during the academic school year, high school students from across the nation and from other countries participate in the Discovery Hall's summer marine science class. Students live on campus for the duration of the course and participate in over 170 hours of lectures, field studies, research projects, and written and practical exams. The course is offered during two summer sessions lasting four weeks each. It introduces students to physical and chemical oceanography, marine ecology and marine biology. The Alabama State Department of Education approves this course and recommends that local school systems grant credit toward a Standard or Advanced High School Diploma for students participating in Discovery Hall's marine science class.

This year 49 students, 30 from Alabama and 19 from other states, participated in the summer course; three of these students were on scholarship. Scholarships to students from the state of Alabama were awarded from the Dauphin Island Sea Lab (1) and the Beth Ladner Memorial Scholarship (1). A scholarship was also awarded to one Mississippi student by the Mississippi-Alabama Sea Grant Consortium. Additionally, funding for minority students was provided by the Summer Search Foundation in California.

Teacher Training

The World of Water for Teachers, a Title II-funded summer inservice program, received applications from 738 Alabama teachers, of which we were able to host 235. This



overwhelming interest demonstrates the need and effectiveness of this kind of hands-on science knowledge in Alabama's classrooms. This intensive course is offered to all Alabama Elementary and Secondary teachers. Approximately 50 of these teachers were working on advanced degrees and chose to take this course for credit through the University of West Alabama. In the seven years of this program, Discovery Hall has been able to teach over 1600 teachers, who in turn serve as satellite teachers for their schools, bringing specimens and curriculum materials back to the school to be shared among their colleagues. We hope that the Title II program will continue to be federally funded, and we look forward to another great summer with teachers.

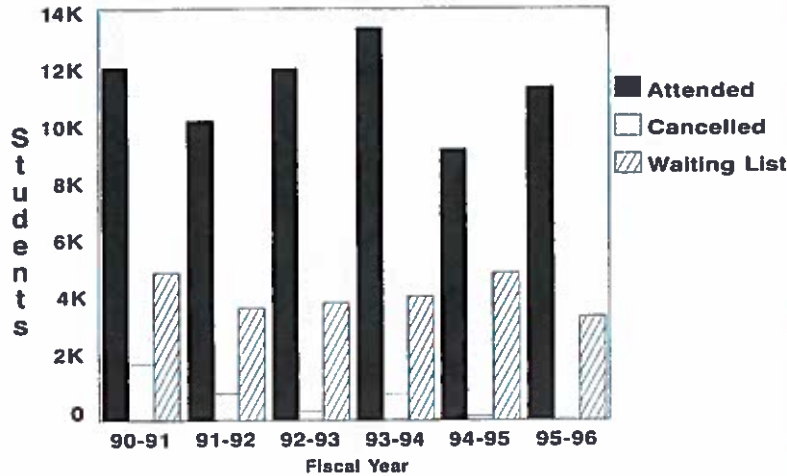
Pre-Service Teacher Training

DHP will continue its Pre-Service (student) Teacher Training workshops this fall and next spring. College juniors and seniors who have chosen the teaching profession as a career are introduced to the principles of science using examples from Mobile Bay and coastal Alabama. PSTT provides K-4 grade pre-service teachers with field, lab, and teaching experiences. The teachers participate in hands-on learning activities which they can take to their future classrooms. This experience is supplemented by a multitude of resources and background materials. This project is funded by the Mississippi-Alabama Sea Grant Consortium.

Professional Activities

The marine education faculty participated in several meetings. Sessions were presented at the National Science Teachers Association, the National Marine Educators Association, the National Wildlife Federation, the Alabama Science Teachers Association, and the

DISCOVERY HALL ENROLLMENT



*Totals Include out of state enrollment

temporary educator with DHP, has filled the vacant position and brings new skills to the program.

Discovery Hall Faculty

John J. Dindo, Ph.D. 1991 (University of Alabama at Birmingham).
Department Chairman.

Jenny Cook, M.S. 1991 (University of South Alabama). Marine Educator. Emphasis on K-12 and high school summer course.

John DiPlacido, Jr., M.S. 1996 (Oregon State University). Marine Educator. Emphasis on K-12.

Angie Dixon, M.S. 1994 (University of Texas, Arlington). Marine Educator. Emphasis on K-12 and high school summer course.

Dana Roberts, B.S. 1992 (Samford University). Marine Educator. Emphasis on K-12 and teacher training.

Hazel Wilson, B.S. 1981 (Memphis State University). Marine Educator. Emphasis on K-12 and teacher training.

Denise Keaton, Registrar.

Environmental Education Association of Alabama.

Discovery Hall faculty also attended several marine biology workshops, including Water Education for Teachers, Project Aquatic Wild Workshop, and a Global Change Workshop.

Faculty Changes

Upon receiving his Master's Degree in Marine Science Education, John DiPlacido returned to the Sea Lab in June and started teaching in the World of Water program. Ms. Casey Harrison received a full-time teaching position in Baldwin County and resigned from the lab at the end of Summer School. Ms. Harrison did a great job with children, and Baldwin County has gained a good teacher. Ms. Angie Dixon, a

Year	K-5	Middle	High	College	Teachers	Other	Total
FY 90-91	2759	533	265	103	62	415	4137
FY 91-92	5918	1732	1061	677	129	681	10198
FY 92-93	7236	2139	1486	663	30	360	11914
FY 93-94	7847	2141	1906	624	172	642	13332
FY 94-95	5626	1483	1151	606	8	342	9216
FY 95-96	7165	1916	1482	577	78	254	11472
Total	36551	9944	7351	3250	479	2694	60269

updated October 1, 1996

University Programs

One of the most significant changes at the DISL during the 1995-96 academic year was the establishment of the University Programs within the DISL organizational structure beginning January 1, 1996. The University Programs now include all of the activities associated with undergraduate and graduate education and research at the DISL, including the Summer School Program. The Program is organized much as a university department in that the faculty submit nominees for the Chair of University Programs to the Executive Director, who subsequently appoints the Chair to serve a renewable term. Dr. Jonathan Pennock was appointed as the first Chair. Along with the change in organizational structure, much hard work and many exciting changes have occurred with the University Programs during the past year.

Faculty

The University Programs faculty are charged with developing and teaching a diverse curriculum at both the undergraduate and graduate levels, directing graduate students in their thesis and dissertation research, maintaining vigorous research programs in both basic and applied research, and providing service to the public and the marine science community at the local, state and national levels.

This year was marked by the addition of two new faculty members to the program. Dr. William 'Monty' Graham arrived in September, 1995, after receiving his Ph.D. degree from the University of California,

Santa Cruz in 1994. Dr. Graham's expertise lies in the coupling of biological and physical processes in the marine environment with a focus on plankton processes, particularly with zooplankton. Dr. Florence 'Flo' Thomas joined the faculty in January, 1996 from a post-doctoral position at the University of Hawaii. Dr. Thomas received her Ph.D. in 1992 from the University of California at Berkeley where she focused on research that uses an engineering approach to examine processes (e.g. biomechanics) at the interface between biology and hydrodynamics.

Currently, there are 10 University Programs core faculty in residence at DISL, with 7 employed by the DISL (Drs. Aronson, Graham, Heck, Pennock, Stout, Thomas and Valentine), 2 employed through the University of South Alabama (Drs. Cowan and Kiene) and 1 employed through the University of Alabama (Dr. Schroeder). Collectively, University Programs faculty have been highly productive, as evidenced by the 28 peer-reviewed journal publications and 51 presentations made at scientific meetings during the 1995-96 academic year.

Undergraduate Program

The Summer School Program is conducted primarily in support of undergraduate degree programs at the 22 DISL member institutions. In 1996, this program once again delivered over 900 undergraduate semester hours of marine related courses to 132 students from 16 of the 22 member universities (See Course Listing). Over the past several years, the success of this program has resulted in the DISL reaching its capacity to provide teaching space, logistical support, and room and board during the two five-week sessions (this is the cause of the stabilization of semester hours delivered at ~ 900 over the past several years; see Figure). In 1996, courses in *Dolphins & Whales* and *Marine Invertebrate Behavioral Ecology* were offered during an intensive one-week Pre-Term. These courses were well received and enabled us to provide additional diversity to the undergraduate offerings at the DISL. Based partially on this success, and the desire for additional course offerings, University Programs will propose to begin offering additional Pre-Term, Post-Term and Fall-Term courses beginning in 1997.



13 Students in the Marine Biology class march down to their field site to begin their Beach Lab.

1996 Summer School Course Offerings

Special Topics: Dolphins and Whales	Regan
Special Topics: Marine Invertebrate Behavioral Ecology	Richardson
Introduction to Oceanography	Schroeder
Marine Botany	Stout
Marine Biology	Pennock
Marine Biology	O'Brien
Marine Invertebrate Zoology	Aronson
Marine Biology for Teachers	Wilson
Marine Technical Methods	Dardeau
Coastal Climatology	Sebastian/Williams
Coastal Zone Management	Lima
Coastal Ornithology	Moore
Marine Ecology	Heck
Marine Geology	Canis
Marine Vertebrate Zoology	Shipp
Marine Vertebrate Zoology	Parsons
Coastal Geomorphology	Douglass
Commercial Marine Fisheries of Alabama	Wallace
Directed Research	

Graduate Program

The Graduate Program at the DISL supports students from 9 of the 22 member schools which have graduate degree programs when the students' program of study requires use of DISL resources. Support from DISL is obtained through the request of Graduate Research Status (GRS), and is available both to resident graduate students who base their studies at the DISL and graduate students based at their home campuses who require more limited sampling and logistical support at the DISL. During the 1995-96 academic year, there were 41 active GRS students who received research support, 37 of whom were resident at DISL. In addition, 5 students completed their theses programs during the reporting period (see Listing).

Significant investments were also made in acquiring additional desk and office space for graduate students in residence at DISL

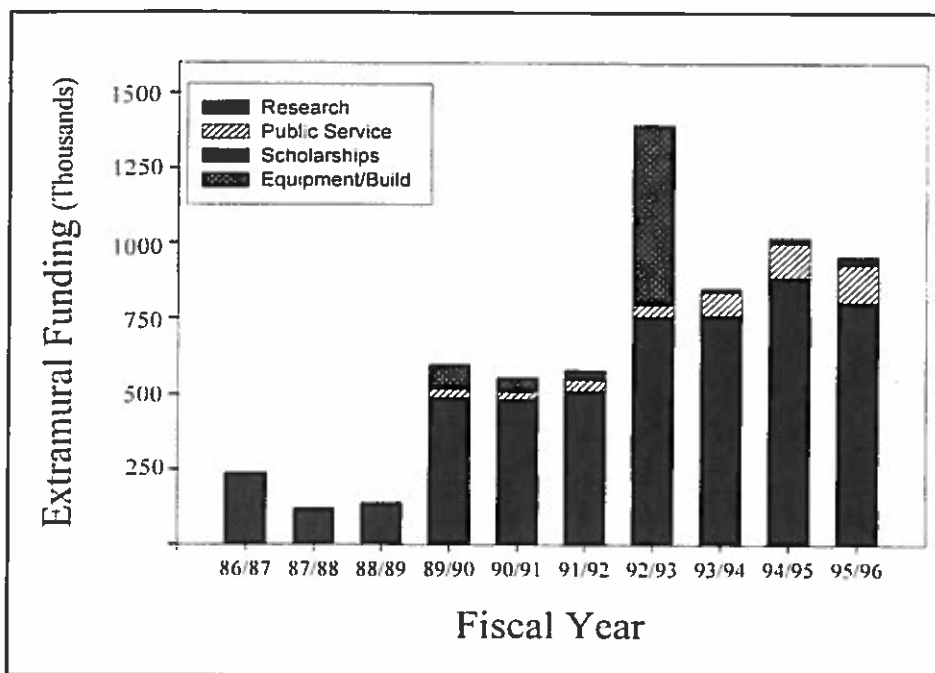
in 1996. This growth was necessitated primarily as a result of the growth of the Marine Science Department at the University of South Alabama over the past several years. This growth has added significantly to the graduate program at the DISL, and in combination with increased academic offerings, a strong seminar series and substantial research funding, has stimulated the development of a rigorous year-round program.

Student Fellowships and Financial Support

The DISL expended \$32,960 in support of graduate and undergraduate fellowships during the 1995-96 fiscal year. Full and partial graduate fellowships were awarded to Ms. Carrie Hubard (MS, University of Alabama), Mr. Walter Ingram (MS, University of South Alabama), Fennel Blythe (MS, University of South Alabama), and Julie Woodcock (MS, University of South Alabama) through DISL funds and donations provided by the Mobil Oil Company and Shell Oil Company foundations. DISL Undergraduate fellowships were awarded to Ms. Olivia Jones (University of West Alabama), Ms. Sybil Kennington (University of South Alabama), Mr. Travis Tyberg (University of West Alabama) and Mr. Michael Zimlich (Troy State University) for the 1996 summer program. In addition, over \$7,000 was made available in support of undergraduate work-study jobs and room and board allowances during the summer program through DISL funds and donations provided by the Exxon Oil Company. We are very appreciative of the support provided to our students through these donations by the Exxon, Shell and Mobil companies and their foundations.

1996 DISL Visiting Summer School Faculty

Dr. Wayne Canis - University of North Alabama
Dr. Scott Douglass - University of South Alabama
Dr. James Lima - Troy State University
Dr. Frank R. Moore - University of Southern Mississippi
Dr. Jack O'Brien - University of South Alabama
Fr. Gerald Regan - Spring Hill College
Dr. Terry Richardson - University of North Alabama
Dr. Glen Sebastian - University of South Alabama
Dr. Robert Shipp - University of South Alabama
Dr. Aaron Williams - University of South Alabama
Dr. Glen Parsons - University of Mississippi
Mr. Richard K. Wallace - Alabama Cooperative Extension Service



change. Closer to home, studies in the wetland and seagrass systems of the northeast Gulf of Mexico and production and fisheries dynamics in local estuaries move us closer to understanding the functions of these valuable marine habitats.

In addition, research opportunities helped support two post-doctoral researchers at the DISL during the reporting period. Dr. Johanna Matilla is supported on a Fulbright Scholarship and working under the direction of Dr. Heck, while Dr. Andy Thompson is working and supported on a National Science Foundation grant of Dr. Kiene. These investigators not only provide research colleagues for their DISL faculty sponsors but also serve to

bring new ideas and interactions to all faculty and students in the program.

On the negative side, Hurricane Opal destroyed the old roof on the DISL wet lab, and served to shut down the facility between November 1995 and August 1996. Now repaired, students and faculty are beginning to re-establish their research within the facility. Many thanks go to our colleagues at the Alabama Department of Conservation - Marine Resources Division who offered experimental space during the shut-down.

Research

Basic and applied research is a central component to the educational programs and the overall mission of the DISL. University Programs faculty are extremely active in the pursuit of extramural funding in support of research activities, resulting in over \$962,000 in extramural support during the 1995-96 academic year. Research grants and contracts come from diverse sources, including: the National Science Foundation, the Mississippi-Alabama Sea Grant Consortium, the National Oceanographic and Atmospheric Administration (NOAA) Coastal Ocean Program, the Electric Power Research Institute, the Environmental Protection Agency, the National Park Service, the NOAA - National Undersea Research Program, the Department of Agriculture, the Office of Naval Research, the National Institute for Global and Environmental Change, the Alabama Department for Economic and Community Affairs and the Alabama Department of Environmental Management.

These studies are generally focused locally and regionally, however, several studies include international components. For example, Dr. Aronson traveled to Antarctica during the winter of 1995 to collect fossils for his paleo-ecological studies of predator-prey relationships, and Mr. Brian Jones (MS student at the University of South Alabama under the direction of Dr. Kiene) participated in a 3-month cruise from the northeastern Pacific Ocean to the southern Indian Ocean measuring sulfur gases in seawater and their potential role in global climate



Dr. Ronald Kiene in the laboratory.

Special commendation to...

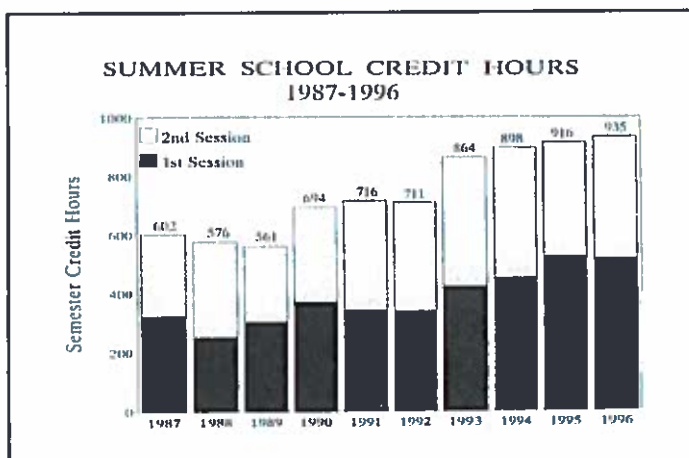
Jean Cowan, M.S., 1996 (University of South Alabama) who was awarded "Best Student Paper" at the 1995 Estuarine Research Federation 13th International Conference in Corpus Christi, Texas. This prestigious award was given in recognition of her paper, "Sediment-water nutrient and oxygen fluxes in Mobile Bay, Alabama: A study of seasonal and interannual forcings and functions."

Graduate Students Completing Theses in 1995-96

- Bailey, H. Killebrew The effects of Habitat Complexity and Cannibalism on Young-of-the-year Red Snapper (*Lutjanus campechanus*)
(MS, University of South Alabama: December 1995)
- Blythe, Ellen Fennel The physiological responses of the seagrass, *Thalassia testudinum*, to defoliation of aboveground tissue.
(MS, University of South Alabama: June 1996)
- Fernandez, Felix Nitrogen & Phosphorus Regeneration from Sediments during Summer Hypoxic/Anoxic Periods in Mobile Bay
(MS, University of South Alabama: December 1995)
- Foster, Charles Alan Variation in fecundity & condition Indices for the calanoid copepod *Acartia tonsa* along an estuarine salinity gradient.
(MS, University of South Alabama: June 1996)
- Miley, Glen Patterns of sulfate reduction in the sediments of a *Juncus roemerianus* marsh.
(MS, University of South Alabama: June 1996)

1995-96 Graduate Course Offerings

- Fall Quarter:
 - Biological Oceanography Pennock
 - Physical Oceanography Cowan
 - Marine Ecology Heck
 - Applied Wetlands Science Stout
- Winter Quarter:
 - Chemical Oceanography Kiene
 - Benthic Ecology Heck
 - Oceanology of the Gulf of Mexico Schroeder
 - Zooplankton Ecology Graham
 - Marine Conservation Biology Valentine
- Spring Quarter:
 - Field Marine Science: Florida Keys Stout/Schroeder
 - Marine Biogeochemical Processes Pennock
 - Microbial Ecology Kiene
 - Fisheries Oceanography Cowan
 - Coral Reef Ecology Aronson



Public Service

Coastal Policy Initiative

The reorganization at the Sea Lab stimulated considerable discussion about the name, role and function of the coastal policy group. The professional staff and faculty of the Sea Lab have always endeavored to provide consultative services to the community at large, as requested. For many years, this was largely informal and restricted to the "hard" sciences, but has expanded recently to include many aspects of comprehensive planning. There is also an increasing demand that resource allocations be based on rigorous science. The Coastal Policy group at the Sea Lab provides support to local government and state agencies and there are particularly close relationships with the Alabama Department of Economic and Community Affairs (ADECA) and the South Alabama Regional Planning Commission (SARPC). In an effort to distinguish the activities of those involved in coastal policy from the more established departments now recognized in the Table of Organization as standing Programs, this "interdepartmental" project will be referred to as the Coastal Policy Initiative. The staff listing reflects those professionals who have had significant time commitments to the effort over the past year.

The Initiative provided direct support to ADECA through extensive revision and editing of the Alabama Coastal Area Management Plan (ACAMP), which had not been revised since 1987. A complete restructuring allowed the incorporation of several new issues and shifted the content toward a more modern ecosystem-level management structure. Many of the principles of integrated coastal management have been recognized as well as the re-awakening of the Public Trust Doctrine.

Coastal Programs staff provided a significant effort within the Coastal Cleanup and other public outreach projects for ADECA. This relationship is expected to continue even though Jennifer Bachmann moved to a position in Mississippi at the end of the reporting year. Numerous meetings were staffed by Sea Lab representatives to promulgate the mission and work towards the goals of the ACAMP.

The Mobile Bay National Estuary Program (MBNEP) was formally established through the South Alabama Regional Planning Commission, as proposed by the nomination package. Sea Lab personnel continued to serve the process through a memorandum of understanding with SARPC. This relationship continues but SARPC has since chosen to relinquish the MBNEP grant since

the Environmental Protection Agency ruled that a conflict of interest situation existed and they would not be able to participate as a planning agency. The Sea Lab is still involved as a number of science proposals have been prepared and submitted to the MBNEP as part of the Characterization Study required.

Coastal Policy Personnel

Dr. George F. Crozier, Senior Marine Scientist and Associate Professor
Dr. John F. Valentine, Senior Marine Scientist and Assistant Professor
Michael Dardeau, Marine Scientist
Cherie Arceneaux, Coastal Planner and Research Associate
Alma Wagner, Research Associate
Jennifer Bachmann, Coastal Planner

Sea Lab Docent Program

Visitors to the Sea Lab this year can see brilliant evidence of our docents' hard work by viewing the colorful landscaping on the campus grounds. Butterflies and humans alike delight in these gardens, which eight of our docents planted after taking Master Gardening classes offered by the Alabama Cooperative Extension System. Planted entirely with native plants and perennials, the landscaping was accomplished with no fertilizer and little water. The group also held a Native Plant Sale which featured both flora and hand-made crafts, lovingly tooled by the docents. Their efforts were rewarded by the proceeds (over \$5,000) and the tremendous interest in native plants paid by the general public.

The educational efforts of the docents were also apparent, as they instructed visitors, great and small, about the diversity of marine life during Kids' Days in Bienville, Bayfest, and many other Baymobile sites. They also engaged the Sea Lab's K-2 visitors with exciting fish print classes. On the research side, docents also take part in aiding research faculty in the laboratory. As the Education Center is now expanding into the full-fledged Estuarium facility, the docents are looking forward to taking an active part in educating and communicating with an increasing public audience. The Sea Lab is grateful for the energy and talents that these docents give to the DISL and to the public.

Docent Personnel

Lynne Bridges, Program Coordinator

The Estuarium

The Estuarium is the name of the new facility being built to offer a broader educational base for students and the public. Estuarium is Latin for "estuary," of which Mobile Bay is the fourth largest in the U.S., based on water flow. The Discovery Hall Program teaches over 14,000 K-12 students a year and has to turn away 4,000 to 6,000 each year due to space and instructor constraints. In an effort to offer an educational opportunity to these students and to educate the general population about Mobile Bay, the ESTUARium project was initiated 5 years ago.

Phase I, the Living Marsh and Barrier Island Boardwalk, was completed during the winter of '92-'93 when the Sea Lab restored the natural marsh system on the north side of the property. **Phase II**, the Education Center, was a converted 1950's radar-dome; the Education Center was extremely successful while it was open, and saw well over 20,000 visitors from around the United States. When the Estuarium is completed, the Education Center will become the Husbandry Building of the facility, housing the animals until they are deemed healthy enough to enter the big tanks of the Estuarium.

Today, we are erecting steel for our final phase, **Phase III** of the Estuarium, the 10,000 square-foot Exhibit Hall, with the expectation of opening in the fall of 1997. Over 150,000 local, national and international visitors are expected annually at the Estuarium, and are expected to inject around \$20 million into the local economy. The Estuarium will become the responsibility of the Discovery Hall Program, and as such will have educators working within the facility. Many docent volunteers have asked to be a part of this program which will benefit the entire operation of the Sea Lab. The Discovery Hall Program will begin to offer training workshops for those docents interested in working in the Estuarium. These required workshops will start in the summer and will address the ecosystem of the Mobile-Tensaw Delta, Mobile Bay, the Barrier Islands, and the near-shore Gulf of Mexico, the major themes within the Estuarium. For more information on this course, please contact the Sea Lab at (334) 861-2141.

Estuarium Personnel

Robert Dixon, Project Manager
Cheryl Ondeka, Aquarist

Special Thanks for a Unique Donation

For over 50 years, Dr. William Warren of South Baldwin County has been an avid conchologist, or shell collector. As a student at Spring Hill College in the 1940's, Dr. Warren took a marine biology course on Grand Isle, and thus started a life-long obsession. Suffering a minor setback when his mother threw away a couple of hundred specimens, Dr. Warren's passion for shells continued to grow until the collection's number reached over 2,000 examples of common and rare specimens. Ranging from *Spondylus*, or the thorny oyster shell, found in Florida and the Caribbean, to the rare *Pleurotomaria*, or slit shell, native to the deep waters of the Pacific Ocean, this impressive collection has now found a new home at the Dauphin Island Sea Lab.

Eager to share his collection with all generations of students, Dr. Warren donated this impressive labor of love in April 1996. In addition, Dr. Warren also gifted the library with 40 volumes of books on shells. The Dauphin Island Sea Lab would like to extend its heartfelt gratitude for his generosity in this gift, which will be a valuable teaching tool to the hundreds of students who will now have the opportunity to see these shells, instead of viewing them as merely a picture in a textbook.



The Estuarium during construction.





ESTUARIUM CAMPAIGN PROGRESS REPORT

September 30, 1996

Goal: 3 Million Dollars
(Exhibit Hall and Displays)

Total Cash to Date \$1,404,880
Balance Due on Pledges \$352,950
Total Donations and Pledges to Date \$1,757,830


Contributors

(Cash/Pledge ≥ \$500)

Aaron Oil	Delaney Foundation	Monte L. Moorer Foundation
Akzo Nobel Chemical, Inc.	Delchamps, Inc.	Mr. and Mrs. Harwell Moose
Alabama Power Foundation	Dr. and Mrs. Jack DiPalma	Sheldon Morgan
Alabama River Pulp	Dr. and Mrs. Sam Eichold	Occidental Chemical Corp.
Atlantic Marine	Elf Atochem	Olin Corp. Charitable Trust
Auburn High School Science Club	Exxon Company, U.S.A.	Port City Rental
B & B Pet Stop	First Alabama Bank	Saunders Engine
Bedssole Foundation	Bernie Fogarty	Scott Paper Foundation
Dr. Barry Booth	Gayfers	Seamen's Club of Mobile, Inc.
BP America	Graham Oil Field Services	Sears Roebuck & Company
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Betty, Jennifer, Wayne Canis	Hoechst Celanese	South Central Bell
Chandler Foundation	Holnam, Inc.	Southtrust Bank
Chevron U.S.A. Inc.	Dr. and Mrs. John Howell, III	Steiner Shipyard
Ciba Geigy	c/o James and John Howell, IV	Taylor Wharton Manufacturing
Coastal Builders	Huls America	William and Marietta Urquhart
Coastal Land Trust	International Paper Foundation	Dr. and Mrs. John Val-Galas
Community Found. of South Alabama	Doris and Gerald Ladner	Dr. and Mrs. Milton Wallace
Cooper/T. Smith	Lillian C. McGowin Foundation	Dr. and Mrs. Claude Warren, III
Courtaulds Fibers	Midstream Fuel	Waste Management
Dr. and Mrs. William Crotwell	Mitchell Foundation	Whitney Bank
George and Deanna Crozier	Mobil Exploration & Producing	Dr. and Mrs. Neil Wimberley
Cytec Chemical	Mobile Big Game Fishing Club	Russell Wimberly
Degussa	Mobile Gas Service	Zeneca

Gifts-in-kind

ADECA	Scott Paper
AmSouth	Sea Lab Architects
Baldwin Times	Southtrust Bank
BCM	Steiner Shipyard
Catholic Charities	Ellis Taul
Clarion Hotel	Telephone Pioneers
Golden Stevedoring	Army Corps of Eng.
Holnam	Army Reserve
Lewis Communications	Coast Guard
Mobile Press Register	Vision Design
Realtor Association	WKRG TV5
Port City Rental	Waller Brothers
Port of Mobile	Dr. and Mrs. William A. Warren
SARPC	Wire Rope & Rigging
Sullivan/St. Clair Ad.	



Kiene, R. P. 1996. Turnover of dissolved DMSP in estuarine and shelf waters of the Northern Gulf of Mexico. Pp. 336-349, In: R. P. Kiene, P. T. Visscher, G. O. Kirst and M. D. Keller (Eds.), *Biological and Environmental Chemistry of DMSP and related sulfonium compounds*. Plenum Press.

Kiene, R. P. 1996. Microbiological controls on the emissions of dimethyl sulfide from wetlands and the ocean. In: J. C. Murrell and D. P. Kelly (Eds.), *Microbiology of atmospheric trace gases*. NATO ASI Series I, Vol. 39. Springer-Verlag, Berlin Heidelberg. Pp. 205-225.

Kiene, R. P. 1996. Microbial cycling of organosulfur gases in marine and freshwater environments. In: D. Adams, S. Seitzinger and P. Crill (Eds.), *Internationale Vereinigung für Theoretische und Angewandte Limnologie Mitteilungen No. 25: Cycling of reduced gases in the hydrosphere*. E. Schweitzerbart'sche Verlagsbuchhandlung (Nagel & O. Obermiller), Stuttgart, Germany. Pp. 137-151.

Mattila, J. 1995. Does habitat complexity give refuge against epibenthic predation? Some evidence from two field experiments. In: A. Eleftherious, A. Ansell and C. J. Smith (Eds.), *Biology and ecology of shallow coastal waters*. Proc. 29th EMBS. Olsen & Olsen, Fredensborg, Denmark. Pp. 261-268.

Schroeder, W. W., J. R. Pennock and Wm. J. Wiseman, Jr. 1996. A note on the influence of a deep ship channel on estuarine-shelf exchange in a broad, shallow estuary. Pp. 159-170, In: C. Pattiaratchi (Ed.), *Mixing Processes in Estuaries and Coastal Seas*, Coastal and Estuarine Studies, Vol. 50, American Geophysical Union, Washington, DC.

Non-Refereed Publications

Dardeau, M. R. 1996. Estuarine Consumers, Pp. 37-51, In: T. Miller-Way, M. Dardeau, G. Crozier (Eds.), *Weeks Bay National Estuarine Research Reserve: An Estuarine Profile and Bibliography*. Dauphin Island Sea Lab Technical Report 96-01.

Macintyre, I. G. and R. B. Aronson. 1996. Field guidebook to the reefs of Belize. Proceedings of the Eighth International Coral Reef Symposium, Panama. Smithsonian Institution, Washington, DC.

Pennock, J. R. 1996. Nutrients and Aquatic Primary Production. Pp. 30-36, In: T. Miller-Way, M. Dardeau, G. Crozier (Eds.), *Weeks Bay National Estuarine Research Reserve: An Estuarine Profile and Bibliography*. Dauphin Island Sea Lab Technical Report 96-01.

Schroeder, W. W. 1996. Environmental Setting. Pp. 15-25, In: T. Miller-Way, M. Dardeau, G. Crozier (Eds.), *Weeks Bay National Estuarine Research Reserve: An Estuarine Profile and Bibliography*. Dauphin Island Sea Lab Technical Report 96-01.

Stout, J. P. 1995. Alabama wetlands conservation and management initiative. Vol. 1. Summary report on Alabama wetlands. D. J. Davies (Ed.), Alabama Geological Survey, 274 p.

Stout, J. P. 1995. Alabama wetlands conservation and management initiative. Vol. 2. Bibliography of wetlands: Issues and trends with selected annotations. M. A. Irvin (Ed.), Alabama Geological Survey, 439 p.

Stout, J. P. 1996. Estuarine Habitats. Pp. 27-29, In: T. Miller-Way, M. Dardeau, G. Crozier (Eds.), *Weeks Bay National Estuarine Research Reserve: An Estuarine Profile and Bibliography*. Dauphin Island Sea Lab Technical Report 96-01.

Valentine, J. F. and T. Lynn. 1996. Pollution. Pp. 62-74, In: T. Miller-Way, M. Dardeau, G. Crozier (Eds.), *Weeks Bay National Estuarine Research Reserve: An Estuarine Profile and Bibliography*. Dauphin Island Sea Lab Technical Report 96-01.

Published Abstracts and Presentations

Aronson, R. B. 1996. Stasis, biological disturbance, and community structure of a coral reef in Belize. Florida State University, Tallahassee, FL, January, Invited.

Aronson, R. B. 1996. Multivariate techniques in coral reef video surveys. University of Miami, Workshop on Reef Assessment in the Florida Keys, January, Invited.

Aronson, R. B. and D. B. Blake. 1995. Counterrevolution in the Eocene: Paleozoic-type echinoderm communities in the Upper La Meseta Formation, Antarctica. Geological Society of America Abstracts with Programs 27:A114.

Aronson, R. B. and D. W. Swanson. 1996. Shift in coral reef community structure following a ship-grounding disturbance. Marine Benthic Ecology Meeting, March 7-10, Columbia SC.

Bailey, H. K., IV, J. H. Cowan, Jr. and R. L. Shipp. 1996. Potential interactive effects of habitat complexity and sub-adults on age-0 red snapper behavior. Symposium on Life History, Taxonomy and Recruitment of reef-fish Larvae and Juveniles, Proc. 20th Annual Meeting of the Early Life History Section of the American Fisheries Society, June, New Orleans, LA, Invited.

Blake, D. B. and R. B. Aronson. 1995. Eocene asteroids at Seymour Island, Antarctic Peninsula. Geological Society of America Abstracts with Programs 27:A112.

Breitburg, D., K. Rose and J. H. Cowan, Jr. 1995. Effects of low dissolved oxygen on trophic interactions in an estuarine zooplankton-fish larval predator food web: an individual-based modeling approach. P. 12, In: *Estuaries: Bridges from Watersheds to Coastal Seas*, Abstracts from the Estuarine Research Federation, 13th International Conference, November 12-16, Corpus Christi, TX.

Clark, R. and J. P. Stout. 1995. Reproductive ecology of *Vallisneria americana* in an estuarine environment. P. 23-24, In: *Estuaries: Bridges from Watersheds to Coastal Seas*, Abstracts from the Estuarine Research Federation, 13th International Conference, November 12-16, Corpus Christi, TX. 22

Cowan, J. H., Jr. 1995. Individual-based models as tools for studying fish recruitment. Virginia Institute of Marine Sciences, College of William and Mary, December, Gloucester Point, VA, Invited.

Cowan, J. H., Jr. 1995. Larval fish dynamics and recruitment variability: the role of density-dependent feedbacks on prey resources. University of Maryland, College Park, December, Invited.

Cowan, J. H., Jr. and J. Mattila. 1996. Fish effects on prey resources during early life: a meta-analysis of past studies. Proc. 20th Annual Meeting of the Early Life History Section of the American Fisheries Society, June, New Orleans, LA.

Cowan, J. H., Jr., K. A. Rose and C. Enright. 1995. Flow, water management and recruitment of striped bass in the San Joaquin-Sacramento River system. P. 28-29, In: Estuaries: Bridges from Watersheds to Coastal Seas, Abstracts from the Estuarine Research Federation, 13th International Conference, November 12-16, Corpus Christi, TX, Invited.

Cowan, J. L. W. and J. R. Pennock. 1995. Sediment-water nutrient and oxygen fluxes in Mobile Bay, Alabama: a study of seasonal and interannual forcings and functions. P.28, In: Estuarine by scyphomedusae: clearance rates and escape. 1996 Ocean Sciences Meeting, American Society of Limnology and Oceanography, February, San Diego, CA.

Cowan, J. L. W. and J. R. Pennock. 1995. Sediment-water nutrient and oxygen fluxes in Mobile Bay, Alabama: a study of seasonal and interannual forcings and functions. P.28, In: Estuaries: Bridges from Watersheds to Coastal Seas, Abstracts from the Estuarine Research Federation, 13th International Conference, November 12-16, Corpus Christi, TX.

Goodrick, S., W. W. Schroeder, R. McNider, T. Davis. 1996. Influence of Antarctic Katabatic winds on the circulation of the coastal southern ocean with implications for phytoplankton distribution. EOS, Trans. AGU, 77(3), Ocean Sciences Meet. Suppl., OS144.

Graham, W. M. 1995. The upwelling shadow: A new class of coastal retention features. UCSB Marine Science Institute, Celebration of Discovery Conference.

Graham, W. M. 1995. Biological-physical interactions close to shore: The influence of small-scale circulation on benthic and planktonic patterns in northern Monterey Bay, California. University of Alabama, Department of Biology Seminar, Invited.

Gregory L. and J. R. Pennock. 1995. Effects of nutrient enrichment and grazer presence on the epiphytes of the seagrass *Thalassia testudinum*. P. 51, In: Estuaries: Bridges from Watersheds to Coastal Seas, Abstracts from the Estuarine Research Federation, 13th International Conference, November 12-16, Corpus Christi, TX.

Hancock, K. M., W. W. Schroeder, D. J. Benson and P. J. Pearce. 1996. Late Quaternary organic buildups, outer continental shelf, northeast Gulf of Mexico. Abstracts with Program, 45th Annual SE Section, GSA, 28(2):14.

Heck, K. L., Jr., J. F. Valentine, S. A. Sklenar, J. R. Pennock and L. Gregory. 1995. Top/down and bottom/up effects in seagrass ecosystems. P. 54, In: Estuaries: Bridges from Watersheds to Coastal Seas, Abstracts from the Estuarine Research Federation, 13th International Conference, November 12-16, Corpus Christi, TX.

Heck, K. L., Jr. 1995. Seagrass meadows: Top/down and bottom/up effects. Florida International University, Invited Seminar.

Heck, K. L., Jr. 1995. Ecology of seagrass meadows in the Gulf of Mexico. University of Southern Mississippi, Invited Seminar.

Heck, K. L., Jr. 1996. St. Joe Bay Seagrasses. Port St. Joe, FL, Invited Public Presentation to St. Joe Bay Committee.

Hoffman, L. and R. Kiene. 1996. Uptake of glycine betaine by natural microbial assemblages: evidence for a high affinity uptake system which also recognizes DMSP. Am. Soc. Limnol. Oceanogr./Am. Geophys. Union Meeting, February, San Diego, CA.

Kiene, R. P. 1996. Methanethiol, a high reactive reduced sulfur gas is produced from dimethylsulfoniopropionate (DMSP) in marine surface waters. Am. Soc. Limnol. Oceanogr./Am. Geophys. Union Meeting, February, San Diego, CA.

Kiene, R. P. 1996. Methylation of sulfides in anoxic wetland sediments. Wetlands Biogeochemistry Symposium, March, New Orleans, LA.

Largier, J. L., S. R. Wing, W. M. Graham and L. W. Boisford. 1996. Observations of northern California upwelling-intermittency, alongshore variability and poleward transport over the inner shelf. EOS 76(3).

Lehrter, J. C., J. R. Pennock and G. McManus. 1995. Microzooplankton grazing and nitrogen excretion across an estuarine/coastal interface. P. 76, In: Estuaries: Bridges from Watersheds to Coastal Seas, Abstracts from the Estuarine Research Federation, 13th International Conference, November 12-16, Corpus Christi, TX.



Dr. Jonathan Pennock (left) and Dr. Robert Shipp examine a graduate student poster.



Sessions Convened

Cowan, J. H., Jr. 1995. Convener and Session Chair, Theme Session on YOY Fish Energetics and Biochemistry, Annual Meeting of the American Fisheries Society, September, Tampa, FL.

Cowan, J. H., Jr. and C. Grimes. 1995. Co-Convener, Theme Session on Estuarine Dependency and Recruitment Bottlenecks, Annual Meeting of the American Fisheries Society, September, Tampa, FL.

Grants & Contracts Active During 1995-1996

Aronson, R. B. Synoptic survey of coral reefs in the Florida Keys National Marine Sanctuary. NOAA National Undersea Research Program, 1995-97, Chief Scientist, \$120,000.

Aronson, R. B. Disturbance and recovery from ship groundings in the Florida Keys National Marine Sanctuary: a long-term, hypothesis driven monitoring program. NOAA National Undersea Research Program, 1994-96, Chief Scientist, \$258,500 (Aronson, \$124,500).

Aronson, R. B. Paleocological setting of Eocene echinoderms at Seymour Island, Antarctic Peninsula. National Science Foundation, 1994-97, Principal Investigator, \$57,500.

Aronson, R. B. An experimental test of the onshore-offshore predation hypothesis. NOAA National Undersea Research Program, 1995-96, Principal Investigator, \$23,031.

Aronson, R. B. Disturbance and diversity of Caribbean coral reefs; a biogeographic study. National Geographic Society, 1994-97, Principal Investigator, \$8,500.

Aronson, R. B. Long-term dynamics of a coral community in the Belizean Barrier Reef lagoon. Smithsonian Institution Caribbean Coral Reef Ecosystems Program, 1996-97, Principal Investigator, \$2,000.

Cowan, J. H., Jr. and L. A. Fuiman. Peril of the unfit or the unfortunate: Larval fish fitness and vulnerability to predators. National Science Foundation, 1995-1999, Co-Principal Investigator, \$525,675 (Cowan, \$248,000).

Cowan, J. H., Jr. and E. D. Houde. Recruitment processes in estuarine fishes: Pattern, scale and ontogenetic trends. National Science Foundation, 1995-1999, Contributing Investigator, \$640,652 (Cowan, \$60,479).

Cowan, J. H., Jr. The trophic dynamics of pinfish and their role as consumers in temperate seagrass ecosystems. Mississippi-Alabama Sea Grant Student Fellowship (K. Thompson, Ph.D. Fellowship), 1995-1996, Principal Investigator, \$6,000.

Cowan, J. H., Jr. Biogeochemical tracers in red snapper otoliths: A test of the unit stock hypothesis. Mississippi-Alabama Sea Grant Student Fellowship (Will Patterson, Ph.D. Fellowship), 1996-1997, Principal Investigator, \$6,000.

Cowan, J. H., Jr. Directed field sampling and individual-based modeling: Striped bass in the San Joaquin-Sacramento River System. California Department of Water Resources, 1991-1997, Principal Investigator, \$210,000.

Cowan, J. H., Jr. Key species project development: Striped bass and anchovy. Electric Power Research Institute and the Oak Ridge National Laboratory, 1991-1996, Principal Investigator, \$180,227.

Cowan, J. H., Jr. Comparative study of the life history and production potential of bay anchovy *Anchoa mitchilli* and northern anchovy *Engraulis mordax*: An individual-based modeling approach. Sport Fishing Institute, EPRI Fellowship in Population Biology (Shyh-Bin Wang, Ph.D. Fellowship), 1993-1996, \$40,450.

Cowan, J. H., Jr. Distributional ecology of marine mammals in the Gulf of Mexico. NOAA, National Marine Fisheries Service (Lisa Mills, Ph.D. Fellowship), 1995-1996, \$21,900.

Graham, W. M., W. R. Perry, M. Page, and A. Alldredge. An automated nutrient analyzer system for biological research. National Science Foundation BIO/ID/MBE, 1996, Co-Principal Investigator, \$50,398.

Graham, W. M., J. P. Stout, W. W. Schroeder, J. Lima. Study of Gulf Coast oil spill contingency plans with respect to remediation and restoration. National Sea Grant/U.S. Army Corps of Engineers, 1996-1997, Co-principal Investigators, \$188,994, (Graham, \$34,440).

Heck, K. L., Jr. and P. Carlson. Relationship of current water quality transparency criteria and light requirements of seagrass *Thalassia testudinum* and *Halodule wrightii*. Environmental Protection Agency, 1994-1996, Co-Principal Investigator, \$120,000 (Heck, \$77,870).

Heck, K. L., Jr. Coastal Alabama Seafood Harvest (CASH): Oyster Studies. Department of Agriculture, 1995-1997, Principal Investigator, \$88,000.

Heck, K. L., Jr. and M. J. Sullivan. An ecological analysis of seagrass meadows of the Gulf Islands National Seashore. Department of the Interior - National Park Service, 1993-1996, Co-principal Investigator, \$131,000 (Heck, \$96,398).

Kiene, R. P. Marine biogeochemistry of dissolved DMSP and its sulfur-containing degradation products. National Science Foundation, Chemical Oceanography 1996-1999, Principal Investigator, \$308,721.

Kiene, R. P. and M. E. Hines. Dimethylsulfide metabolism in relation to carbon cycling pathways in Sphagnum-dominated wetlands. National Science Foundation - Ecosystems, 1996-1999, Co-Principal Investigator, \$137,429.

Kiene, R. P. International symposium on DMSP and related sulfonium compounds. U.S. Department of Energy, National Institute of Global Environmental Change (NIGEC), 1995-1996, Principal Investigator, \$5,000.

Pennock, J. R., R. P. Stumpf, P. A. Tester, R. Arnone, K. Carder and C. Thomas. Ocean color algorithm evaluation for remote sensing of coastal and estuarine waters: U.S. South Atlantic bight and eastern Gulf of Mexico. NOAA Coastal Ocean Program, 1996-1999, Co-Principal Investigator, \$682,110 (Pennock, \$119,776).

Pennock, J. R. and J. H. Cowan, Jr. Nutrient-enhanced production and trophic dynamics in Weeks Bay, Alabama. Mississippi-Alabama Sea Grant Consortium, 1996-1998, Co-Principal Investigators, \$103,524.

Schroeder, W. W. Geologic framework of outer shelf and upper slope carbonate structures northeastern Gulf of Mexico: Implications for late Quaternary eustatic sea level fluctuations and regional climate/paleoecological variability. NOAA/National Undersea Research Program-9530, 1996, Principal Investigator, \$114,928.

Schroeder, W. W. Geologic framework of outer shelf and upper slope carbonate structures northeastern Gulf of Mexico: Implications for late Quaternary eustatic sea level fluctuations and regional climate/paleoecological variability. Mississippi-Alabama Sea Grant Consortium R/ER-28-PD, January-June, 1996, Principal Investigator, \$9,900.

Schroeder, W. W. Graduate Fellowship Fund - DISL/MESC. Shell Oil Company Foundation, 1995-1996, Principal Investigator, \$2,500.

Schroeder, W. W. Graduate Fellowship Fund - DISL/MESC. Mobil Foundation, 1995-1996, Principal Investigator, \$5,000.

Shipp, R.L. Infrastructure program in marine sciences, infrastructure director. National Science Foundation (EPSCoR), 1992-1995, \$262,352.

Shipp, R.L. Site fidelity and homing behavior in red snapper (*Lutjanus campechanus*) in the northern Gulf of Mexico. MARFIN, 1995-1997, Principal Investigator, \$126,052.

Stout, J. P. Assessment of the impacts of elevated structures on emergent salt marshes. 1995 -1996, Alabama Department Economic and Community Affairs, Principal Investigator, \$18,076.

Stout, J. P. Habitat restoration in estuarine submerged grassbeds: Is recovery recruitment limited? Mississippi-Alabama Sea Grant Consortium, 1994-1996, Principal Investigator, \$124,521.

Stout, J. P. Functional assessment protocol: a tool to improve protection, management and enhancement of Alabama's wetland resources. US Environmental Protection Agency/Alabama Department Environmental Management, 1994-1996, Principal Investigator, \$153,000.

Stout, J. P. The relative importance of facilitation and competition between *Juncus roemerianus* and *Spartina alterniflora* in coastal Alabama. Mississippi-Alabama Sea Grant Student Fellowship (Lee Stanton, M.S. Fellowship), 1996-1997, Principal Investigator, \$4,000.

Valentine, J. F. and K. L. Heck, Jr. Sea urchins in seagrasses: an experimental examination of the impact of chronic sea urchin grazing on the turtlegrass habitats in the Florida Keys. NOAA/ National Undersea Research Program, 1995-1997, Co-Principal Investigators, \$64,800.



Dr. Judy Stout examines trays that had been placed in Mobile Bay for an experiment with seagrasses.

Extramural Support 1995/96

Fellowships	Description	Amount
Cook	Ladner Family	1,090
Heck/Bologna	MS-AL Sea Grant	823
Heck/Peterson	MS-AL Sea Grant	2,607
Pennock/Lehrter	MS-AL Sea Grant	2,640
Cowan/Patterson	MS-AL Sea Grant	1,865
Stout/Stanton	MS-AL Sea Grant	749
Schroeder	Oil Companies	4,826
Education		
Dindo	"World of Water" - Teacher Training	108,698
Dindo	MS-AL Sea Grant, K-12 Pre-Service	32,414
Research		
Aronson	Palaeoecology of Seymour Island	12,190
	Onshore-offshore Predation	2,239
	Recovery from Ship Groundings	58,643
	Biogeography of Coral Reefs	16,543
Heck/Pennock Valentine	SAV Ecology	10,856
Heck	Oyster Ecology	36,147
	Light Limitations of SAV	34,012
	Seagrasses of National Seashore	52,504
McManus/Cowan	Food Chains of Planktivores	20,850
Miller-Way	Sediment Diagenesis of San Juan Bay	14,420
Pennock/Schroeder	Nutrient Dynamics of Weeks Bay	10,899
Pennock	Weeks Bay Trophic Dynamics	23,135
Stout	Wetland Functional Assessment	53,709
	Pier Effects on Emergent Wetlands	7,598
	Restoration of Seagrass Beds	28,121
Valentine	Grazing Impacts on SAV	16,128
Public Service		
Crozier/Arceneaux	MS Sound Policy Studies	28,500
	Non-Point Source Study	35,689
	Weeks Bay Site Characterization	16,000
Crozier/Dardeau	Revision of AL Coastal Management Plan	30,000
Crozier	Development of Adaptive Resource Management Strategy	13,000
	ADECA Section 306 Legal Background Assessment	16,000
Dardeau	Weeks Bay Monitoring	5,233
Miscellaneous		
Heck/Graham	EXXON Summer Jobs	3,000
TOTAL		\$701,128



Board of Directors

The Board of Directors of the Dauphin Island Sea Lab/ Marine Environmental Sciences Consortium consists of the chief executive officer of each member institution. The Board of Directors determine the general policies of the DISL/MESC.

The Board at reporting time includes:

- Dr. William H. Harris, Alabama State University
- Dr. Jerry F. Bartlett, Athens State College
- Dr. William Muse, Auburn University
- Dr. Roy H. Saigo, Auburn University at Montgomery
- Dr. Neal R. Berte, Birmingham Southern College
- Dr. Wanda D. Bigham, Huntingdon College
- Dr. Harold J. McGee, Jacksonville State University
- Dr. David E. Potts, Judson College
- Dr. Thomas E. Corts, Samford University
- Rev. William J. Rewak, S.J. , Spring Hill College
- Dr. Joseph B. Johnson, Talladega College
- Dr. Jack Hawkins, Jr., Troy State University
- Dr. Michael Malone, Troy State University at Dothan
- Dr. Benjamin F. Payton, Tuskegee University
- Dr. Roger Sayers, University of Alabama (retired 6/96)
- Dr. Andrew Sorenson, University of Alabama
- Dr. J. Claude Bennett, University of Alabama at Birmingham
- Dr. Frank A. Franz, University of Alabama at Huntsville
- Dr. Michael Magnoli, University of Mobile
- Dr. Robert M. McChesney, University of Montevallo
- Dr. Robert L. Potts, University of North Alabama
- Dr. Frederick Whiddon, University of South Alabama
- Dr. Don C. Hines, University of West Alabama

Executive Committee

The Executive Committee at reporting time includes:

- Dr. Roger Sayers, President, University of Alabama — **Chairman, Board of Directors** (term ended 6/96)
- Dr. Robert L. Potts, President, University of North Alabama - **Chairman, Board of Directors**
- Dr. George F. Crozier, Executive Director, DISL/MESC - **Secretary (ex officio)**
- Dr. Don C. Hines, President, University of West Alabama - **Chairman, Executive Committee and Institutional Representative**
- Dr. Asa Green - **Chair Emeritus**
- Dr. Frank Romano, Jacksonville State University - **Program Committee Chairman**
- Dr. Ken Marion, University of Alabama, Birmingham - **Program Committee Representative**
- Dr. Doug Hileman, Tuskegee University - **Program Committee Representative**
- Dr. Malcolm Braid, University of Montevallo - **Program Committee Representative**
- Dr. Robert Pullen, Troy State University - **Institutional Representative**
- Dr. Lowell Frobish, Auburn University - **Institutional Representative**
- Fr. William J. Rewak, President, Spring Hill College - **Institutional Representative**
- Dr. Joseph Thomas, University of North Alabama - **Institutional Representative**
- Dr. James Wolfe, University of South Alabama - **Institutional Representative**

Program Committee

The Program Committee of the Dauphin Island Sea Lab/ Marine Environmental Sciences Consortium consists of one faculty member from each of the member institutions appointed by the chief executive officer of that institution. Subject to the approval of the Executive Committee, the Program Committee has the following responsibility:

To serve as the primary liaison and communication link between faculty members of the participating institutions and programs of the DISL/MESC.

To advise the Executive Director in planning and implementing the education, research and service programs of the DISL/MESC.

To make recommendations to the Executive Committee dealing with major policy matters.

The Committee Members at reporting time include:

Dr. Shivendra Sahi, Alabama State University

Dr. Tom Jandebour, Athens State College

Dr. Ray Henry, Auburn University

Dr. John Aho, Auburn University at Montgomery

Dr. Dan C. Holliman, Birmingham Southern College

Dr. Doug McGinty, Huntingdon College

Dr. Frank Romano, Jacksonville State University

Dr. Thomas Wilson, Judson College

Dr. Robert Stiles, Samford University

Fr. Gerald Regan, Spring Hill College

Dr. Arthur Bacon, Talladega College

Dr. Stephen Landers, Troy State University

Dr. Eugene Bergquist, Troy State University at Dothan

Dr. Douglas Hileman, Tuskegee University

Dr. Fred Gabrielson, University of Alabama

Dr. Ken Marion, University of Alabama at Birmingham

Dr. Richard Modlin, University of Alabama at Huntsville

Dr. Tina Miller-Way, University of Mobile

Mr. Malcolm Braid, University of Montevallo

Dr. Wayne Canis, University of North Alabama

Dr. Robert L. Shipp, University of South Alabama

Dr. John McCall, University of West Alabama



Member Schools

**Alabama State University,
Montgomery, AL***

Athens State College, Athens, AL

Auburn University, Auburn, AL*

Auburn University at Montgomery,
Montgomery, AL

Birmingham Southern College,
Birmingham, AL

Huntingdon College, Montgomery, AL

**Jacksonville State University,
Jacksonville, AL***

Judson College, Marion, AL

**Samford University,
Birmingham, AL***

Spring Hill College, Mobile, AL

Talladega College, Talladega, AL

Troy State University, Troy, AL

Troy State University at Dothan,
Troy, AL

Tuskegee University, Tuskegee, AL*

**University of Alabama,
Tuscaloosa, AL***

**University of Alabama at
Birmingham, Birmingham, AL***

**University of Alabama in Huntsville,
Huntsville, AL***

University of Mobile, Mobile, AL

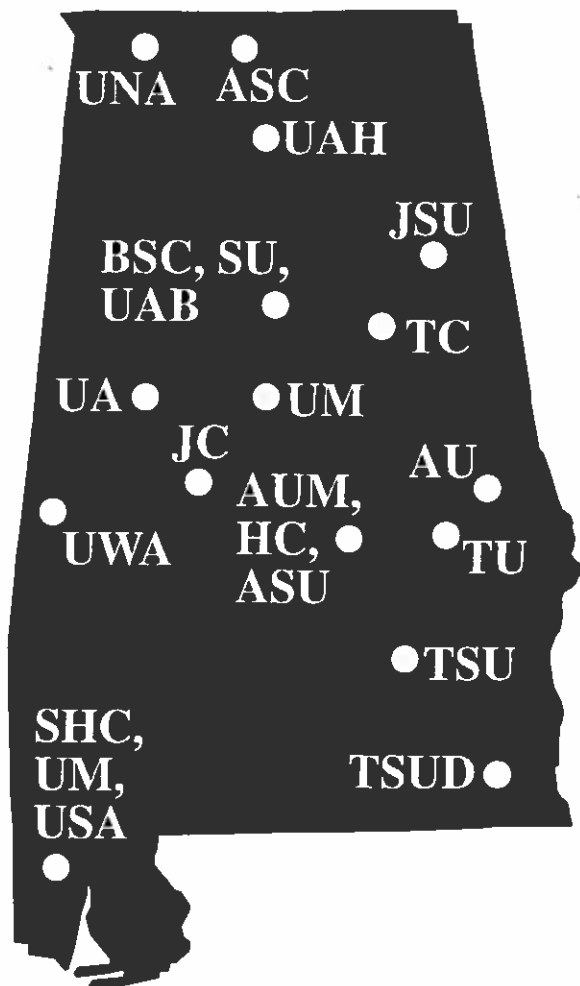
University of Montevallo,
Montevallo, AL

University of North Alabama,
Florence, AL

**University of South Alabama,
Mobile, AL***

University of West Alabama,
Livingston, AL

***Graduate degree programs**



Finances 1995-96

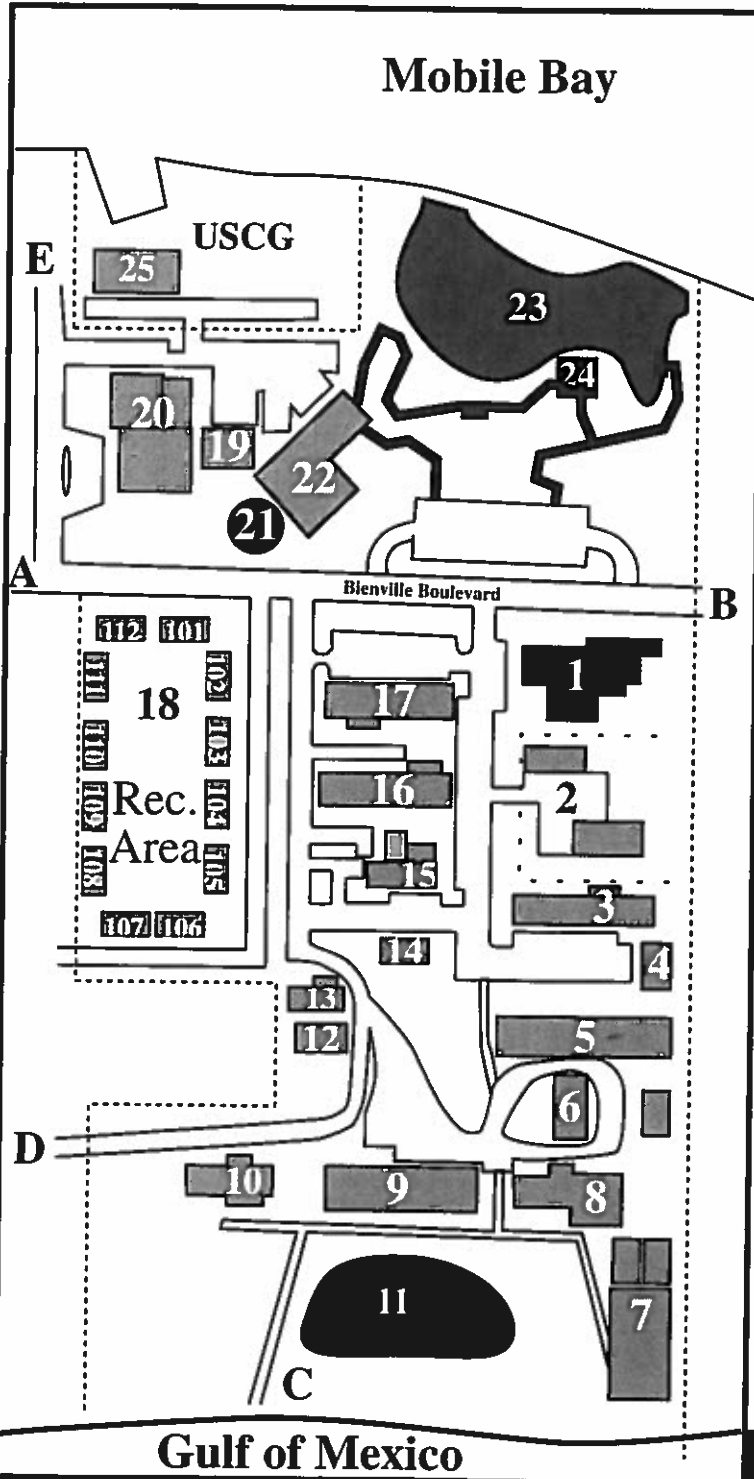
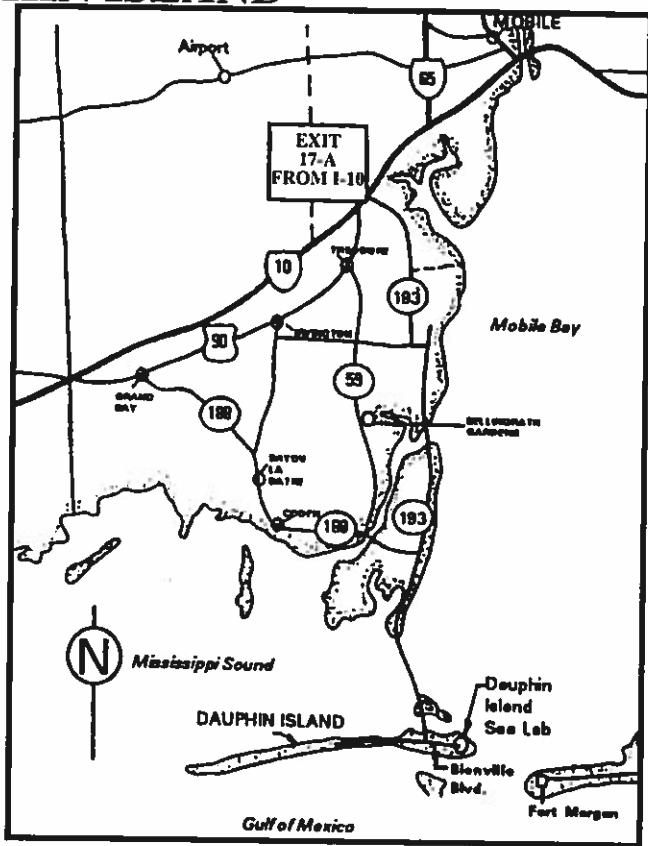
Marine Environmental Sciences Consortium Balance Sheet September 30, 1996

<u>Assets</u>	<u>Current Year</u>	<u>Liabilities&Fund Balances</u>	<u>Current Year</u>
Current Funds		Current Funds	
Unrestricted		Unrestricted	
Cash	544,838	Accts Payable	
Investments		Deposits Liability	
Accts Receivable	21,472	Accrued Leave	156,793
Inventory	55,922	Fund Balance	
		Allocated	456,439
		Unallocated	
Total Unrestricted	622,232	Total Unrestricted	622,232
Restricted		Restricted	
Cash	451,000	Cash Deficit	
Investments	61,306	Accts Payable	
Accts Receivable	308,066	Fund Balance	
		Allocated	820,372
		Unallocated	
Total Restricted	820,372	Total Restricted	820,372
Total Current Funds	1,442,604	Total Current Funds	1,442,604
Plant Fund		Plant Fund	
Investment in Plant		Investment in Plant	
Land	658,757	Net Investment	
Buildings & Improve	3,236,228	in Plant	6,604,994
Improve other than			
buildings	24,951		
Equipment	1,557,466		
Vessels	308,040		
Library Books	308,658		
Const. in Progress	510,894		
Total Investment in Plant	6,604,994	Total Investment in Plant	6,604,994
Total Plant Fund	6,604,994	Total Plant Fund	6,604,994
Agency Fund		Agency Fund	
Cash	15,087	Deposit Held in Custody	
Accts Receivable	(886)	for Others	14,201
Property & Rights Held		Obligations to Employees	
Under Deferred Comp	21,524	Under Deferred Comp	21,524
Total Agency Fund	35,725	Total Agency Fund	35,725

MAP TO DAUPHIN ISLAND

DAUPHIN ISLAND SEA LAB

FACILITIES MAP



- 1. Administration/Bookstore-Giftshop
 - 2. Tech Shop/Vehicle-Boat Yard
 - 3. Albatross Hall (Apartments)
 - 4. Laundromat
 - 5. Maintenance
 - 6. Endeavor Hall (Class Room)
 - 7. Tennis, Basketball, Volleyball Courts
 - 8. Discovery Hall (Class Rooms/Offices)
 - 9. Horizon Hall (Class Rooms/Offices)
 - 10. Galathea Hall (Class/Meeting Room)
 - 11. Sea Pines Trail and Mr. Sand Exhibit
 - 12. Swimming Pool
 - 13. Family Dwelling
 - 14. Family/Faculty Housing
 - 15. Cafeteria
 - 16. Challenger Hall (Dormitory)
 - 17. Beagle Hall (Dormitory)
 - 18. Family/Faculty Housing and Recreation Area
 - 19. Wet Lab
 - 20. Marine Science Hall
 - 21. Husbandry Building
 - 22. The Estuarium
 - 23. Living Marsh and Boardwalk
 - 24. Ladner Pavilion
 - 25. U.S. Coast Guard Facilities
- A. To the Water Tower and Audubon Sanctuary
 - B. To Fort Gaines
 - C. To Gulf Of Mexico Beach
 - D. To U.S. Coast Guard Housing
 - E. To DISL Research Vessels

OPEN TO THE PUBLIC

