

Dauphin Island Sea Lab



Annual Report 1998-1999

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DISL Participation in Alabama, by County-----	Back cover

On the cover, clockwise from top left: Dr. Rich Aronson's Marine Invertebrates course takes a look at their catch during a trawl in Mobile Bay; Docents at the Estuarium use a magnifying camera and television screen to examine marine specimens for a crowd; Dr. Monty Graham (l) and Marine Technician Al Gunter (r) tie a plankton net onto a line during a blue-water dive (photo by Dan Martin); Marine Educator Kirsten Walker holds a group of first-graders in thrall during a touch lab.

All photos in this publication by Lisa Young, unless otherwise credited.

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Statement of Purpose

The Marine Environmental Science 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.



Letter from the Executive Director



Dr. George Crozier, left, and his wife, Dr. Deanna Crozier, at the announcement of his 1999 Coastal Steward of the Year Award from NOAA.

Reporting on any year is always an interesting exercise, ranging from nostalgia and elation to serious contemplation of what may have actually happened! Certainly the last year of a decade, century, or millennium is a momentous time in the history of an institution, a program, or a place and the Dauphin Island Sea Lab has been all of those over the last quarter of the now-past century.

This past year did have its highs and lows. Ms. Rita George, another of the founding spirits of the laboratory, retired during the year. Rita was the interface between the Sea Lab and almost all of its constituency. She brought a personal touch to the relationship with hundreds of teachers throughout the State and region, constantly juggling schedules, facilities, personnel, boats, looking for field trip hosts, boat captains, executive directors, and so forth. These kinds of people, like George Oakes, May Tillman, and Judy Stout, are never replaced – you simply move on to something different.

Another emotional change was the dramatic change in the administrative organization of the Consortium. After 25+ years of efficient functioning, and a remarkable tolerance of the Executive Director, the 12-member Executive Committee of the Board of Directors has been altered to provide a structure, which is considered legal under the non-profit statute of the State. The presidents of Auburn University, Troy State University at Dothan, the University of Alabama, the University of North Alabama, and the University of South Alabama have all graciously agreed to serve on the new Executive Committee. It is my hope that the direct involvement of these individuals will bolster the support provided by the member institutions.

As the laboratory moves into the new millennium, the greater engagement from the active institutions seems to be showing the way to the future. The University of Alabama in Birmingham has been experimenting with a neurophysiology course offered early in the summer while Fisheries and Allied Aquaculture from Auburn University is actively planning a small research facility housed at the Lab. Landscape Architecture, also from Auburn, conducted a complete coastal design studio last spring. It appears likely that these kinds of efforts may be the growth pattern for the foreseeable future. This would represent an interesting return to the founding philosophy of the consortium and the Dauphin Island Sea Lab itself.

One observation seems particularly noteworthy as we end the third decade of trying to develop the facilities at the old, and former,

radar station. It would appear to me, and I think even the casual visitor, that someone has indeed made a “silk purse out of a sow’s ear”. The physical plant was built in the 50’s as a military facility designed to accommodate roughly 75-80 male air force personnel year round! Now the 100,000 square feet of building space see about 100,000 “students” per year, ranging from kindergarten to senior citizens. The care and upkeep of the aging physical plant is entrusted to an extraordinary group of support personnel in Plant Operations! They have systematically renovated thousands of square feet of inappropriate buildings; maintained aging infrastructure; cleaned and cared for every inch of the 30+ acres and buildings; responded promptly and courteously to faculty needs (even the bizarre variety) and in every way are responsible for the Dauphin Island Sea Lab even existing today! Many of these individuals have been here for much of their lives at this point. They have weathered hurricanes, several different supervisors, layoffs, inadequate pay, and even four executive directors! It is easy to argue that they wouldn’t have jobs without the Sea Lab, but there wouldn’t be a laboratory without the exceptional competence and dedication that these men and women have brought to the workplace.

Dr. George F. Crozier
Executive Director



Plant Operations (l-r) back row: Ricky Gibbs, Darrel Mallon (supervisor), Shirley Kirkpatrick, Dave Yommer, Russell Wilson, Wilton Barber, Donald Anderson, Bryan Breaux. (L-r) front row: Mike Connell, Steve Ruf, Marjorie Linn, Shirley Emerson, Tammy Self, Jim Daves. Missing: Dottie Mallon

Administration and Facilities

The Dauphin Island Sea Lab is located on 36 acres on the eastern end of Dauphin Island, a barrier island three miles from the mainland and 40 miles south of Mobile, Alabama. Spanning the width of the island, the Sea Lab has direct access to the Gulf of Mexico, Mobile Bay and Mississippi Sound, making the facility ideal for marine and estuarine study.

Four buildings on the South Campus provide over 9,000 square feet of classroom and laboratory facilities. Marine Science Hall, the main research facility, contains over 8,000 square feet of research and office space. The campus can accommodate over 160 persons in residence, with two dormitories, a two-story efficiency apartment building, eight three-bedroom houses and a cafeteria.

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 the DISL operates under the principles of Fund Accounting set forth by the National Association of College and University Business Officers. The State Examiners of Public Accountants audit annually the procedures, accounting records and policies of the DISL.

Business/Finance Personnel
Georgia Mallon,
*Comptroller/Business-Auxiliaries
Manager*

Lynn Bryant,
Contracts & Grants Manager

Tiffany Cotton,
Accounts Payable/Payroll

David England,
Bursar/Purchasing Agent

Brenda Garrick,
Reservation Coordinator

Joyce Carroll,
Receptionist

Dennis Patronas,
Assistant

Auxiliaries

Auxiliaries of the DISL include the Gift Shop of the Estuarium, cafeteria, laundromat and vending machines. This reporting year, the Gift Shop sales have been wonderful and all profits help with the cost of the operation of the Estuarium

Cafeteria Personnel
Anna Harbison,
Supervisor

Classie Beritiech,
Supervisor

Judy Barber,
Assistant Supervisor

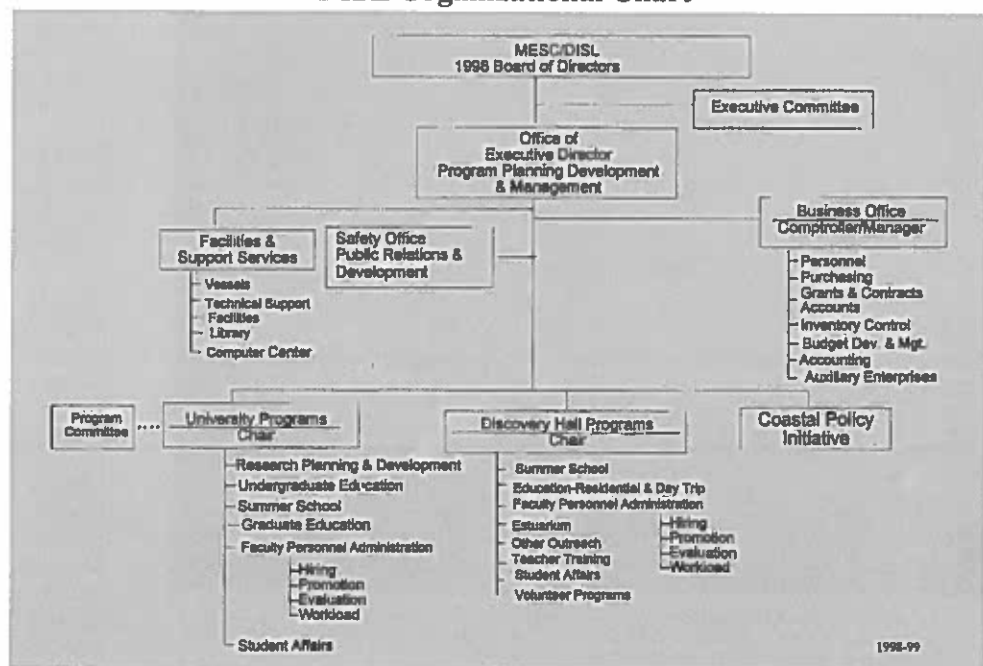
Mandy Harbison

**Estuarium Admissions
and Gift Shop Personnel**
Jeana Layne,
Supervisor

Angel Bosarge,
Supervisor

Jeannine Waltman
Jamelle Ellington
Brandy White

DISL Organizational Chart



Computer Center

The Computer Center supports over 100 personal computers/workstations and three servers. A Windows NT, switched Ethernet, network support users in Marine Science Hall, the DISL Library, the Computer Center, the Estuarium and Administration Building.

In 1999, a high-speed telephone circuit (T1) was installed to provide users with increased speed and access to the Internet. In combination with our internal network this enhancement has greatly reduced the need for modems and dial-up access. Internet connectivity services are provided by the Alabama Research and Education Network.

Computer Center Personnel

Randy Schlude,
Computer Center Manager

Alison Hulcher,
Network Administrator

Library

Considered the finest library for marine science in the state of Alabama, the DISL Library

offers 7071 books, including the donations of the family of Dr. Joy Morrill, and 146 journal subscriptions to faculty, students and the general public during the reporting year. The Library also has electronic access to a variety of on-line catalogs. 565 interlibrary loan requests were sent out this year, with corresponding receipt of materials.

Library Personnel
Connie Mallon,
Librarian

Plant Operations

Meeting the difficult challenges of maintaining and caring for the Sea Lab facility and operations, the Plant Ops team succeeded brilliantly, performing tasks ranging from building the retaining walls around the diesel storage tanks to installing new air-conditioning in the former technical shop, now being used as a temporary wet lab. Everything from ductwork, e.g., replacing the old system under thirteen houses with new aluminum, to woodwork, e.g., rebuilding the boardwalk of



Darrel Mallon, the Plant Operations Supervisor

the Sea Pines Trail after Hurricane Georges, was undertaken with aplomb by the multitasking Plant Ops team, where necessity really is the mother of invention.

During the reporting period, Plant Ops also performed duties such as contracting Vinson Guard Service to provide security at the Sea Lab during evening hours; purchasing a new Chevy Club Pickup for the motor pool; and installing a new gasoline pump.

Plant Operations Personnel

Darrel Mallon,
Plant Operations Supervisor

Donald Anderson
Wilton Barber
Bryan Breaux
Michael Connell
Jim Daves
Shirley Emerson
Ricky Gibbs
Shirley Kirkpatrick
Marjorie Linn
Dottie Mallon
Steve Ruf
Tammie Self
Russell Wilson
David Yommer



Dr. Monty Graham (second from left), Dr. John Dindo (third from left), marine educators and graduate students discuss Dr. Graham's Science Education at Sea Project's Website and educational curriculum in the Computer Center.



WALA Fox 10's Carol Mordis interviews Dr. John Dindo and Mr. Sand during the live morning news program.

Public Relations Office

It was another productive year for the Public Relations Office, with press hits in 32 Alabama counties and increased national and on-line coverage. The Sea Lab was in the spotlight in media markets ranging from the Discovery Channel to Southern Living to Fodor's Travel Guide. TV crews became regular visitors, especially in the wee hours of the morning, as the Estuarium became a favorite location for morning news live shots. Sea Lab scientists were called upon for expert commentary in topics ranging from hurricane damage to jellyfish populations.

The United States Postal Service recognized the Sea Lab's growing popularity by staging its Aquarium Fish Stamp unveiling at the Estuarium. And once again, the 1999 Discovery Day at the Sea Lab, sponsored by Mobil Oil, was big hit with the general public. Additionally, the Public Relations office worked with the Public Outreach Task Force to promote and organize events to recognize Coastweeks in the fall of 1999.

In order to promote the Sea Lab's Estuarium in the tourist market, the Public Relations Director helped found the Mobile Area Attractions Council, to share information and knowledge about the area's growing popularity among travelers. MAAC has already proven useful, as its members

continue to feed the Public Relations office with tour group tips and advice.

Public Relations Personnel

Lisa Young
Public Relations Director

Technical Support and Vessels

Tech Support began Wet Lab renovation early in 1999. Kevin Kirsch was hired, bringing TS staff to three, to oversee the operation of the Wet Lab. The old Wet Lab, completed in 1985, was gutted and ongoing experiments were transferred to a building in the boatyard. This building, known as the "tech shop" and used for storage, had been emptied and air-

conditioned in preparation for its status as a temporary Wet Lab. This building continues to function admirably, providing wet laboratory space to numerous students and faculty. Unfortunately, the renovation costs proved to be too high, and the idea of renovating the old building has been dropped in favor of new construction. Construction of the new 60' x 60' facility, to be located between MSH and the Estuarium husbandry building, will hopefully be completed during the current year, using funds from NSF and the Bedsole Foundation.

Vessel administration merged with Technical Support during the reporting year. All repairs and maintenance were performed as needed.

Technical Support Personnel

Michael Dardeau,
Marine Scientist

Jean Cowan
Marine Technician

Alan Gunter
Marine Technician

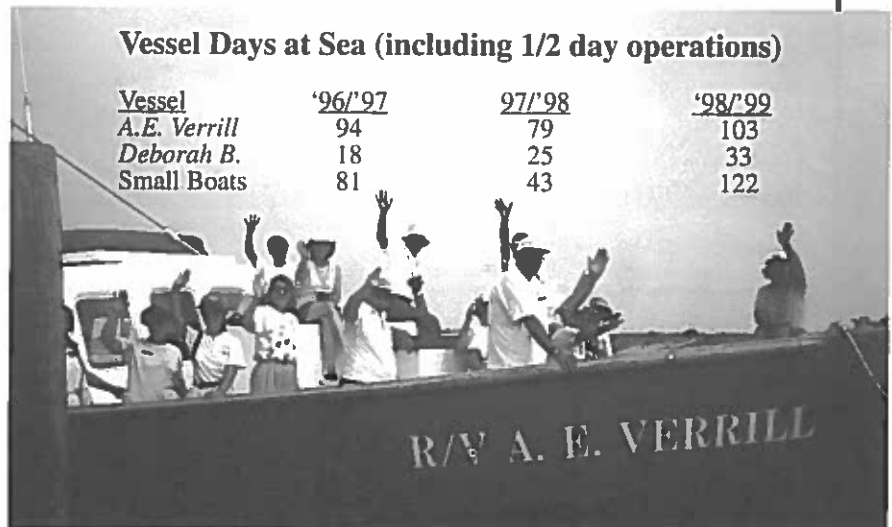
Kevin Kirsch
Marine Technician

Vessel Personnel
Rodney Collier,
Captain

Joe Sullivan
Russell Wilson

Vessel Days at Sea (including 1/2 day operations)

Vessel	'96/'97	97/'98	'98/'99
A.E. Verrill	94	79	103
Deborah B.	18	25	33
Small Boats	81	43	122



Discovery Hall Programs



The sea yields more than just fish sticks - Marine Educator Hazel Wilson (l) prepares delicacies of seaweed, squid, and much more exotic fare for DHP's High School Summer Program.

Field and Lab Programs

The basis of the Discovery Hall Programs is one of capturing the fascination and enthusiasm that all students have with the oceans and funneling that eagerness to learning the applications of science and math in the marine environment. There is no substitute for hands-on learning, when a student can receive a lecture on beaches and then walk the beach, witnessing firsthand the processes that form it and alter it. Students use these lessons to spark lifelong learning. Discovery takes place from the salt marshes of Dauphin Island to the middle of Mobile Bay aboard our research vessel, the A.E. Verrill. The unique ability to blend classroom activities with field and lab applications results in a better understanding of the ecosystem and how the knowledge of science is applied

in these areas. During the 1998/1999 academic year 7,624 students in grades K-12 participated in classroom activities. There was a drop of 3,000 elementary students in classroom activities, but many of these requested the Estuarium in lieu of the classroom. The Estuarium had 15,550 students from across the state that visited. Each student group receives a complete curriculum by grade level which is sent to each teacher prior to arriving at the Estuarium. The curriculum is copied by the teacher and given to each student, providing a full set of activities while visiting the Estuarium.

High School Summer Program

The two summer marine science courses for high school students had a total of forty-eight students enrolled from twelve states. These students earned a full credit in advanced biology by completing the 152 contact hour course. Many of these students came from inner-city schools in California, Massachusetts, and New York

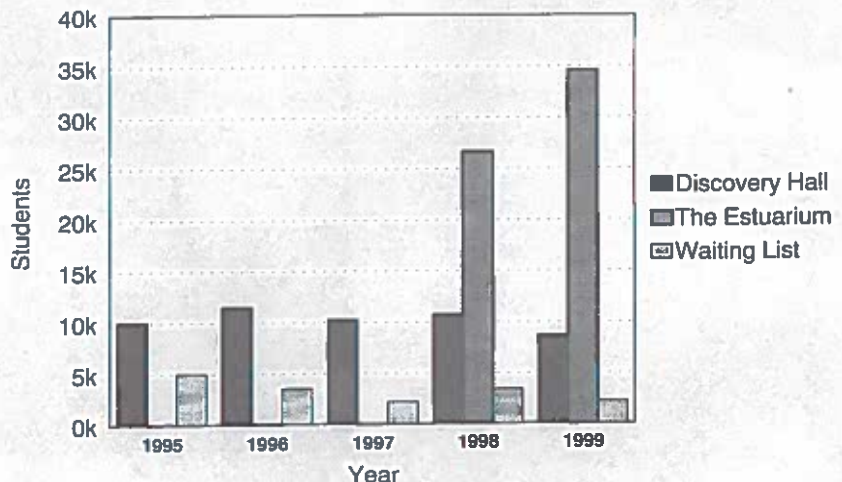
through a program titled Summer Search. For most of these students it was the first time they had been to the coast.

Teacher Training Programs

Although the Title II program grant "World of Water for Teachers" was cut by three weeks this past year, the program continued to have 700 requests for the 175 teacher slots available. The teacher participants were from 34 Alabama counties; 28 of them received graduate credit hours towards their masters degrees. Each teacher returned to the classroom with materials that can be shared with all grade levels at their school.

"Combing the Coasts" was a new science teacher training program that was offered through Discovery Hall last summer. Thirty-two teachers paid their own way to attend this course which compared the flora, fauna and human impact on the salt marshes of the Gulf Coast and the mangroves and corals of the Florida Keys. Three days of marching through the salt marshes and dunes systems of Dauphin Island was followed by snorkeling through the mangroves and coral reefs of Key Largo Florida.

Student Totals for Discovery Hall and The Estuarium



Dauphin Island Sea Lab's Discovery Hall Program Totals

Year	K-5	Middle School	High School	College	Teachers	Other	Total
1990	7,382	1,364	905	473	185	397	10,706
1991	2,296	745	329	127	254	620	4,371
1992	6,103	2,005	1,187	671	254	351	10,571
1993	7,128	1,784	2,123	765	238	529	12,567
1994	7,634	2,083	1,533	603	356	478	12,687
1995	5,981	1,763	1,137	634	213	336	10,064
1996	6,915	2,318	1,411	456	300	126	11,526
1997	6,312	1,630	1,170	648	269	284	10,313
1998	6,233	2,079	1,484	364	230	352	10,742
1999	4,232	2,055	1,397	479	225	301	8,689
Total	60,216	17,826	12,676	5,220	2,524	3,774	102,236

Includes Teacher Workshop and Summer High School totals

"Coastal Connections," a marine science workshop that introduces the multiple barrier island ecosystems surrounding Dauphin Island, was offered again this past summer. Twenty-four teachers from 13 Alabama counties and 14 from Mississippi, Indiana, and Tennessee participated in science activities that centered around barrier islands, salt marshes and dunes, comparing Sand Island, Dauphin Island, and Petit Bois Islands. Eight of these teachers took this course for graduate credit hours.

Angie Dixon,
Marine Educator
M.S. 1994 (University of Texas, Arlington)

Hazel Wilson,
Marine Educator
B.S. 1981 (Memphis State University).

Kirsten Walker,
Marine Educator
M.S. 1998 (University of South Alabama)

Denise Keaton,
Registrar

Discovery Hall Faculty

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

Jenny Cook,
Marine Educator
M.S. 1991 (University of South Alabama)

Grant Craig,
Marine Educator
B.S. 1995 (University of Richmond)

John DiPlacido, Jr.,
Marine Educator
M.S. 1996 (Oregon State University)



Denise Keaton (l) convinces some skeptical children that octopuses are okay to touch - as long as they're from the DHP's Baymobile specimen collection.

University Programs

The University Programs faculty is responsible for implementing the undergraduate and graduate education and research activities at the DISL. In addition to year-round graduate education and research activities, University Programs includes the DISL Summer School Program, the National Science Foundation sponsored Research Experiences for Undergraduates Program at DISL. The primary activities of the program during the 1998-99 academic year are outlined below.

Faculty

During the past year, several changes occurred within the University Programs faculty. First, Dr. Just Cebrian, a marine ecologist/botanist from the Boston University Marine Program and the Marine Biological Lab in Woods Hole was hired to fill the position vacated by Dr. Judy Stout last year. Just will be joining the faculty in the spring of 2000 and will bring diverse talents in comparative ecosystem ecology and marine botany to the faculty. In August, Dr. Flo Thomas left the faculty to move to the University of South Florida. The Program is currently searching for an Ecological Modeler to fill the vacated position.

During the year, the 8 resident University Programs faculty published 31 papers in the refereed literature and have an additional 19 manuscripts in press. In addition, Dr. Pennock co-edited a book with colleagues from Tulane University and the University of Louisiana, Lafayette entitled *Biogeochemistry of Gulf of Mexico Estuaries*. The faculty also delivered 62 presentations at national and international scientific meetings and authored 14 technical publications during the year. Finally, DISL faculty delivered 21 seminars to the general

public, including four at a new quarterly DISL Public Lecture Series that the DISL hosted in Mobile. As part of this series, Drs. Aronson, Schroeder, Dindo and Pennock provided insights on their research ranging from Mobile Bay to the Caribbean and the Pacific Ocean.

University Programs faculty continued to be involved in numerous professional service activities during the year, including: (1) editorship of major journals (Aronson – Journal of Experimental Marine Biology and Ecology and Palaios; Cowan – Estuaries and Gulf of Mexico Science; Heck – Marine Ecology Progress Series and Estuaries; Kiene – Applied & Environmental Microbiology and Marine Chemistry; and Schroeder – Gulf of Mexico Science), (2) workshop and panel participation (Cowan – National Research Council and Gulf Fisheries Council; Heck – Gulf of Mexico Coral Reef Panel; Pennock – EPA Panel on Monitoring Strategies for *Pfiesteria piscicida*, NOAA Estuarine Eutrophication Panel and NOAA Nitrogen Inputs to Watersheds Panel and (3) manuscript and proposal review.

Other ongoing major projects include: (1) planning and preparation for the construction of a new Wet Lab Building funded through the National Science Foundation, (2) initiation of renovations in laboratories to be occupied by Drs. Kiene and Cebrian, and (3) the award of an NSF-FSML proposal for the purchase of three major pieces of

equipment including: a Skalar Four-Channel Nutrient Autoanalyzer, a Sea-Bird Electronics SBE-25 CTD and mini-rosette system, and a DATAFLOW Underway Surface Water Monitoring System for GPS referenced measurement of Salinity, Temperature, Turbidity, Chlorophyll Fluorescence and other parameters.

Undergraduate and Graduate Academic Programs

In 1998-99, University Programs offered 32 courses at the undergraduate and graduate levels (see Table 1). These courses make up a diverse curriculum in marine biology/ecology and coastal and estuarine oceanography for both summer undergraduate students and year-round resident graduate students.



REU participants and their faculty mentors (l-r): Dr. Jonathan Pennock, Dr. Jim Cowan, Melissa Aikens, Dr. Ron Kiene, Rachel Mason, Bryan McCloskey, Sarah Callens, Camilla Roos, Ryan Kroutil, Kady Honeychurch, Dr. Ken Heck (photo by Jenny Foster)

Undergraduate Program

The Summer School Program is conducted primarily in support of undergraduate degree programs at the 22 DISL member institutions. In 1998-99, University Programs delivered 750 undergraduate semester hours (see Figure 1). The summer program saw students from 14 of the 22 member universities. During summer school, University Programs was

Table 1. DISL 1998-99 Course Offerings

<i>Fall Semester 1998</i>			<i>Summer Quarter 1999 - First Session</i>		
Course	Credit	Instructor(s)	Course	Credit	Instructor(s)
Physical Oceanography	(4)	Cowan	Introduction to Oceanography	(4)	Schroeder
Advanced Marine Ecology	(4)	Heck	Marine Biology	(4)	Romano
Biomechanics & Hydrodynamics	(4)	Thomas	Marine Botany	(4)	Timme
Field Marine Science I – Maine Seminar	(2)	Heck/Valentine	Marine Ecology	(4)	Heck
	(1)	Faculty	Marine Vertebrate Zoology	(4)	Cline
			Coastal Climatology	(2)	Blackwell
			Coastal Zone Management	(2)	Crozier
			Marine Technical Methods	(2)	Dardeau
<i>Spring Semester 1999</i>			<i>Summer Quarter 1999 - Second Session</i>		
Course	Credit	Instructor(s)	Course	Credit	Instructor(s)
Biological Oceanography	(4)	Graham	Marsh Ecology	(4)	Faulkner
Chemical Oceanography	(4)	Kiene	Marine Geology	(4)	Canis
Marine Plankton	(3)	Pennock/Graham	Maine Invertebrate Zoology	(4)	Aronson
Fisheries Techniques	(3)	Cowan	Introduction to Oceanography	(4)/(5)	Gamlin/Keyser
Topics in Marine Ecology Seminar	(2)	Aronson	Marine Fish Diseases	(3)	Brady
	(1)	Faculty	Coastal Geomorphology	(2)	Douglass
			Marine Technical Methods	(2)	Dardeau
<i>Summer Semester 1999 - Pre-Term</i>					
Course	Credit	Instructor(s)			
Dolphins and Whales	(2)	Regan			
Marine Protozoology	(2)	Landers			
Estuarine Science	(3)	Pennock			
Geographic Information Systems	(3)	Wu			
Marine Conservation Biology	(3)	Valentine			
Marine Biology	(4)	O'Brien			

able to provide support to numerous undergraduates by offering work-study positions in the library and dormitory as well as providing undergraduate summer fellowships. Fellowship recipients for 1998-99 included: Ms. Adrienne Berg (University of South Alabama), Ms. Stephanie Cooper (Auburn University), Ms. Kristen Porter (University of Alabama at Huntsville), and Mr. Nicholas Selig (University of South Alabama). This support was made available through funds provided by the DISL.

NSF Research Experience for Undergraduates Program

A continuing major component of the undergraduate program at the DISL is the National Science Foundation Research Experience for Undergraduates (REU) Program. In the spring of 1999, Jonathan Pennock received a three-year extension to the REU program that will continue the program through 2002 and extend the program to 12 weeks each fall. In the fall of 1999, DISL completed the first year of the three-year award, which brought 8 talented students from around the country to the DISL for 12 weeks. During the program, each student conducts an independent research project

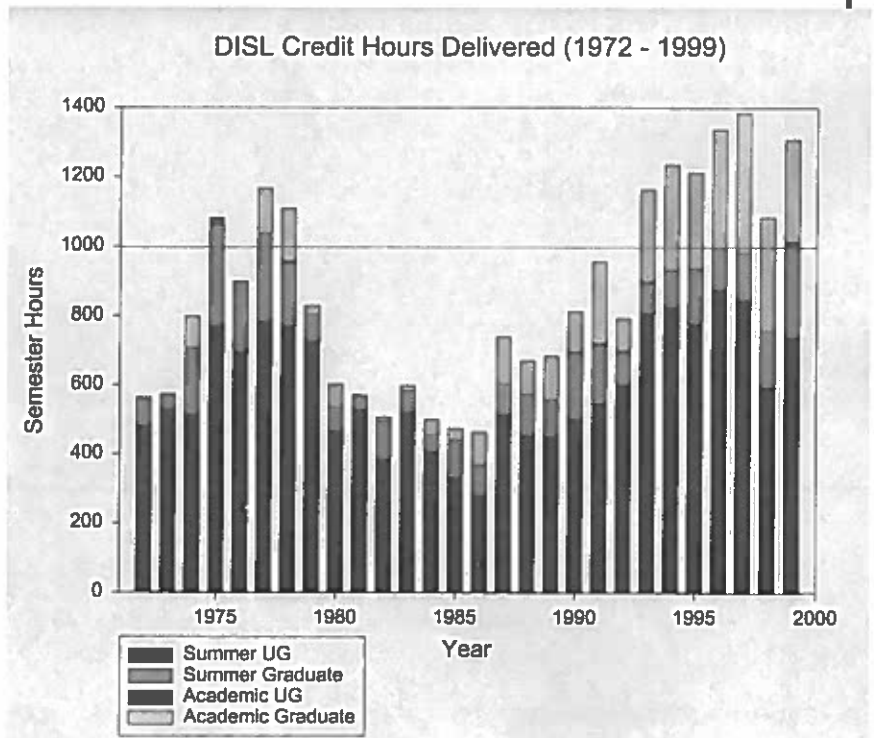
under the direction of a University Programs faculty member and learns about career paths in the marine sciences. The 1999 students and their REU projects are listed in Table 2.

Graduate Program

During the 1998-99 academic year, there were 41 graduate students

who based their studies and received research support from the DISL. During the year, University Programs delivered 532 graduate semester hours (see Figure 1) and provided graduate fellowships to 3 students: Ms. Theresa Berrell (M.S., University of South Alabama), Ms. Leslie Gallagher (M.S., University of South

Figure 1. 1998-99 Credit Hours Delivered



Alabama, and Mr. Jason Stutes (M.S., University of South Alabama). These fellowships were made available through funds provided through the DISL, and gifts from the Mobil Oil Company Foundation and Shell Oil Company Foundation.

Overall, five students graduated during the 1998-99 academic year. In addition to the three students previously listed in the 1997-98 Annual Report, Mr. Brad Peterson, (Ph.D., USA, Interactions between a semi-infaunal suspension feeding bivalve, *Modiolus americanus*, and seagrass assemblages, *Thalassia testudinum*, advisor Dr. Kenneth Heck) and Ms. Leah Gregory, (M.S., UA, Effects of nutrient enrichment & grazer presence on epiphytes of *Thalassia testudinum*, advisor Dr. Jonathan Pennock) completed their theses and graduated.

Research

Basic and applied research is a central component to the educational programs and the overall mission of the DISL.

Table 2. 1999 REU Research Projects, Dauphin Island Sea Lab

Mel Aikens	Bowdoin College, Maine. Bacterial Production and Growth Efficiency in Mobile Bay. <i>Mentor – Dr. Ron Kiene.</i>
Sarah Callens	The Evergreen State College, Washington. Caloric densities of predominant prey of red snapper, <i>Lutjanus campechanus</i> , in the northern Gulf of Mexico. <i>Mentor– Dr. Jim Cowan.</i>
Kady Honeychurch	Washington State University. The contribution of labile organic nitrogen (urea) to phytoplankton production and species composition in Mobile Bay, Alabama. <i>Mentor – Dr. Jon Pennock.</i>
Ryan Kroutil	Oklahoma City University. Effect of medusa size on prey selectivity in the jellyfish <i>Aurelia aurita</i> in the northern Gulf of Mexico. <i>Mentor– Dr. Monty Graham.</i>
Rachel Mason	University of Minnesota. Effects of the snail <i>Neritina reclivata</i> on the level of epiphytic fouling of wild celery, <i>Vallisneria spiralis</i> , and its potential impact on growth. <i>Mentor – Dr. Ken Heck.</i>
Bryan McCloskey	University of Kansas. Positive influences of brittlestars, <i>Echinodermata: Ophiuroidea</i> , on benthic community structure and dynamics. <i>Mentor – Dr. John Valentine.</i>
Camilla Roos	Abo Akademi University. The plastochrone interval and the status of turtlegrass in Big Lagoon, Florida. <i>Mentor – Dr. Ken Heck.</i>

University Programs faculty are extremely active in the pursuit of extramural funding in support of research activities, resulting in \$1,448,641 in extramural support during the 1998-99 academic year (see Figure 2). 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 more broad national and international components.

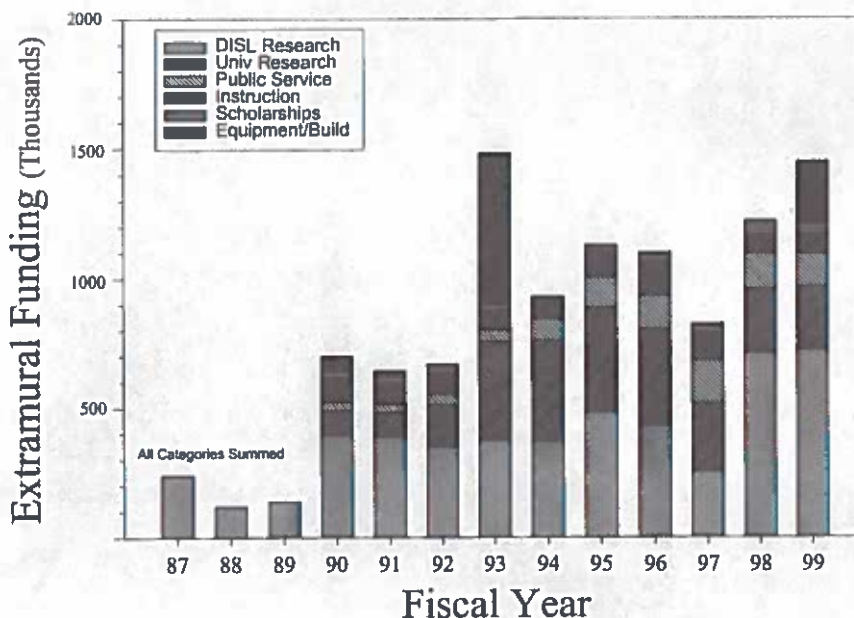
University Programs Administration

Dr. Jonathan Pennock,
Chair, University Programs

Jenny Foster,
Administrative Assistant

Carolyn Wood,
Administrative Assistant

Figure 2. 1998-99 Extramural Funding



Public Service

Coastal Policy Initiative

Personnel from the Coastal Policy group have been engaged in several specific projects, most of which are continuations of previous work. Certainly the group was collectively gratified by the recognition afforded Dr. Crozier by NOAA as the 1999 Coastal Steward of the Year. This reflects well on the efforts of everyone associated with the coastal zone management efforts at the Sea Lab.

Alma Wagner has continued the development of the Coastal Counties Wetland Management Plan initiated by Dr. Stout. A number of meetings have successfully brought the agencies to areas of common discussion. There are concerns about the limited effectiveness and management capacity of the 10' contour line as the legal coastal zone for the State. The CPI has brought some of the research carried out at Auburn into consideration as a mechanism for expanding non-regulatory management of the Coastal Zone to land above the 10' contour.

There has also been detailed consideration of the issues surrounding the fact that the State has no policy defining wetlands as being waters of the State. Such a designation would effectively strengthen the ability of the environmental community to protect these valued resources. The mechanism for establishing such a policy is the subject of much discussion and will extend throughout the next planning period.

Public access issues are being addressed through the design of a bicycle trail around the Bay. This effort is led by Cherie Arceneaux, but there is also discussion about a specific segment in the northwest quadrant which would be associated with the Tricentennial celebration in Mobile. This has resurrected some of the discussions revolving around the Monroe Park area. Increased public engagement with the coastal waters is seen as a cornerstone to continued support for Coastal Zone Management.

A significant amount of staff time has remained committed to the Mobile Bay National Estuary Program. As part of that process, as well as support to ADECA's CZM program, outreach efforts with regard to Sustainable Development, watershed management, land use, and local government initiatives have been maintained.

Coastal Policy Personnel

George F. Crozier,
Executive Director

Michael Dardeau,
Marine Scientist

Cherie Arceneaux,
*Coastal Planner and
Research Associate*

Alma Wagner,
Research Associate

Cathy Barnette,
Research Associate

Docent Dialogue

The Discovery Hall Programs offered two four-day (3 hours a day) Docent Training classes this past year. Twenty-two volunteers participated in the program. There are 60 active docents, and approximately 20 part-time docents participating in Estuarium and outreach programs from the Sea Lab. This year docents helped with programs such as Bienville in the Park, BayFest, Festival of Flowers, Spanish Fort Celebration, Shrimp Festival in Gulf Shores, Coden Heritage Days, Kids Building Day at Home Depot, and Exploring with the Exploreum. In addition to teaching, docents assist in maintaining a beautiful butterfly garden around the cafeteria and directors office, help with large DHP mail-outs, and do outreach in Mobile and Baldwin counties. The Dauphin Island Sea Lab Docents are a vital component to the success of the educational programs. If you would like to

learn more about Mobile Bay and the life that abounds in these waters and would like to tell others about it; please join us for one of our docent classes. For more information please call Ms. Denise Keaton at 861-7515.

The Estuarium - A Bounty of the Sea

In 1999, the Estuarium had 66,247 visitors that were enthralled by the beauty and explanations of life that abounds in and around the waters of Mobile Bay. A jewel in Mobile's string of pearls, the Estuarium offers visitors to the barrier island a unique opportunity to view the fresh and salt water life that helps to drive the ecosystem of the Gulf of Mexico. The newest exhibit, the Jellies of Mobile Bay and the Gulf, has generated many questions about jellyfish, their life cycle and their impact on our waters. When you visit the Estuarium this year, listen carefully as you enter the Delta and Bay exhibits for the new sounds of the seas. The Estuarium continues to be the educational experience it was intended, with 52% of the visitation being students. Curriculum for grade levels K-2, 3-5, 6-8, and 9-12 is sent to teachers before coming to the facility. Each student is given an activity sheet upon arrival with specific grade level tasks for them to complete as they read, listen and observe during their Estuarium experience. Look for new experiences in the coming year along our boardwalk and dunes. For school, church, and any other group reservations please call Ms. Denise Keaton at 861-7515.

ESTUARIUM CAMPAIGN PROGRESS REPORT

September 30, 1999

**Goal: 3 Million Dollars
(Exhibit Hall and Displays)**

Total Cash/Pledges Paid to Date \$1,876,704
Balance Due on Pledges \$28,350
Donations for Boardwalk Plaques \$11,005
Total Donations and Pledges to Date \$1,916,059

Special Note: Estuarium Memberships Purchased \$13,493

**Contributors
(Cash/Pledge ≥ \$1000)**

Aaron Oil Company
 Acordis Cellulosic
 —Courtaulds Fibers
 Alkzo Nobel Chemical, Inc.
 Alabama Power Foundation
 Alabama River Pulp
 AMOCO Foundation, Inc.
 AMSouth Bank
 Atlantic Marine
 Auburn High Science Club
 Bagby & Russell Electric
 Bedsole Foundation
 Dr. Barry Booth
 BP America
 Cargill Marketing
 Chevron U.S.A. Inc.
 Ciba Specialty Chemical
 Coastal Builders
 Coastal Land Trust
 Community Found. of South Alabama
 Cooper/T. Smith
 Creanova Inc.
 George and Deanna Crozier
 Cytoc Industries Inc.

Degussa
 Delancy Foundation
 Delchamps Senior Bowl
 Dr. and Mrs. Jack DiPalma
 Dupond Agricultural
 Elf Atochem
 Exxon Company, U.S.A.
 Bernic Fogarty
 Mary Jane Frazer
 Gayfers/Maison Blanche
 Graham Oil Field Services
 Hand Arendall, L.L.C.
 Hearin/Chandler Foundation
 Steve Heath and Susan Daniel
 Hoechst Celanese
 Holnam, Inc.
 International Paper Foundation
 Kerr McGee
 Kimberly-Clark
 —Scott Paper Foundation
 Legacy, Inc. & AEEF
 Lillian C. McGowin Foundation
 Midstream Fuel
 Mitchell Foundation

Mobil Exploration & Producing
 Mobile Bar Pilots
 Mobile Gas Service
 Monte L. Moorer Foundation
 Mr. and Mrs. Harwell Moose
 Sheldon Morgan
 Occidental Chemical Corp.
 Olin Corp. Charitable Trust
 Port City Rental
 Regions Bank
 Saunders Engine
 Seamen's Club of Mobile, Inc.
 Garland and Scottie Sims
 Smith, M. W. Jr. Foundation
 South Central Bell
 Stout, Rick and Judy
 Taylor Wharton Manufacturing
 Dr. and Mrs. John Val-Gallas
 Vulcan Materials
 Peter and Marty Wiese
 Drs. Neil and Ann Wimberley
 Zeneca

Gifts-in-kind

ADECA
 AMJ Equipment
 AmSouth
 Baldwin Times
 BCM
 Catholic Charities
 Clarion Hotel
 Susan Estes
 Golden Stevedoring
 Holnam
 Lewis Communications

Mobile Press Register
 Realtor Association
 Port City Rental
 Port of Mobile
 SARPC
 Sullivan/St. Clair Ad.
 Scott Paper
 Sea Lab Architects
 Southtrust Bank
 Steiner Shipyard
 Ellis Taul

Telephone Pioneers
 May Tillman
 Army Corps of Eng.
 Army Reserve
 Coast Guard
 Vision Design
 WKRG TV5
 Waller Brothers
 Dr. and Mrs. William A. Warren
 Wire Rope & Rigging

The Estuarium at the Dauphin Island Sea Lab Visitor Totals

Year	Students	Adults	Seniors	Members Passes	Total
				Employees, Comps	
1998	26,667	16,468	7,774	2,343	53,252
1999	34,547	18,818	10,427	2,455	66,247
Total	61,214	35,286	18,201	4,798	119,499



Estuarium Personnel

Robert Dixon,
 Esturium Manager

Cheryl Ondeka,
 Senior Aquarist

Gina Fisher,
 Aquarist

Brian Jones,
 Aquarist

Larry Ritchie
 Aquarist

(Photo top left by G. Crozier)



The "eyes" have it - not just the wide-eyed interest of our visitors, but the compound eyes of our live horseshoe crabs, as explained by Docent Joe Harper (l).



Dr. Ron Kiene in the lab with the gas chromatograph

Preliminary characterization of the living resources of the Mobile Bay National Estuary Program. Mobile Bay National Estuary Program.

Published Abstracts and Research Presentations

- Aronson, R. B.** 1999. Threat to reef communities along the flanks of Pelican Cays, Belize. Page 23. *In: Smithsonian CCRE Reports 1996-1998.* Smithsonian Institution, Washington, DC.
- Aronson, R. B., W. F. Precht and I. G. Macintyre.** 1999. Disease and the changing face of Caribbean coral reefs. *Journal of Conference Abstracts (Cambridge, UK)* 4:900.
- Bonzongo, J.-C., W. B. Lyons and W. W. Schroeder.** 1998. Mercury concentrations in the River Don-Azov Sea, Russia. *AWRA Water Resources Conference, Point Clear, AL, November 16-19, 1998.*
- Bruton, J. A., R. P. Kiene and L. J. Linn.** The fate of methanethiol in seawater: Uptake by bacterioplankton and reaction with dissolved organic matter. *Am. Soc. Limnology & Oceanography Meeting, Santa Fe, New Mexico, February 1999.*
- Burns, C. L. and J. R. Pennock.** 1999. HAB distributions in Mobile Bay and the northeastern Gulf of Mexico. *ERF Biennial Meeting, New Orleans, LA.*
- Chaplin, G. and J. F. Valentine.** 1998. Energy flow in a tidal freshwater-estuarine ecotone. *University of South Alabama, 5th Annual Research Forum.*
- Chaplin, G. I. and J. F. Valentine.** 1999. Linking marine and freshwater foodwebs: marine organisms subsidize freshwater consumers in the Mobile Bay Delta. *1999 International Estuarine Research Federation, New Orleans, LA.*
- Chaplin, G. and J. F. Valentine.** 1999. Linking marine and freshwater food webs: spatial subsidies for freshwater consumers from migratory fishes and crustaceans in the Mobile Bay Delta. *Benthic Ecology Meetings. Baton Rouge, Louisiana.*
- Cinkovich, A. M. and W. M. Graham.** 1999. Observations of jellyfish around density discontinuities using an in situ video profiler. *American Society for Limnology and Oceanography, Aquatic Sciences Meeting, Santa Fe, NM.*
- Cowan, J. H., Jr., R. L. Shipp, W. F. Patterson, A. Strelcheck, and J. McCawley.** Red snapper demographics and energetics on artificial reefs: the effects of nearest-neighbor dynamics *7th International Conference on Artificial Reefs and Related Aquatic Habitats, San Remo, Italy, October 1999.*
- Eilers, M. R., J. F. Valentine and K. L. Heck, Jr.** 1999. Differential mortality and gender specific behavioral responses of *Palaemonetes pugio* to predation by *Lagodon rhomboides*. *1999 International Estuarine Research Federation, New Orleans, LA.*
- Eilers, M. R., J. F. Valentine and K. L. Heck, Jr.** 1999. Differential mortality and gender specific behavioral responses of *Palaemonetes pugio* (grass shrimp) to predation by *Lagodon rhomboides* (pinfish). *Benthic Ecology Meetings. Baton Rouge, Louisiana.*
- Fuiman, L. A. and J. H. Cowan, Jr.** Rapid growth and behavioral proficiency of individual larvae: are they related? *Proc. 23rd Annual Meeting of the Early Life History Section of the American Fisheries Society, Beaufort, NC, April 1999.*
- Fuiman, L. A. and J. H. Cowan, Jr.** The first (larval fish) Olympiad of the modern era: are there natural athletes among cohorts of fish larvae? *Proc. 22nd Annual Meeting of the Early Life History Section of the American Fisheries Society, Ann Arbor, MI, July 1998.*
- Gonzalez, J. M., R. P. Kiene and M. A. Moran.** Sulfur Transformations by an Abundant Lineage of Marine Bacteria in the Alpha-Subclass of the Proteobacteria. *Second International Symposium on DMSP and related sulfonium compounds, Groningen, The Netherlands, August, 1999.*
- Gonzalez, J. M., R. P. Kiene and M. A. Moran.** Role in the Sulfur Cycle of an Abundant Lineage of Marine Bacteria in the Alpha-Subclass of the Proteobacteria. *American Society for Microbiology Meeting, St. Louis, MO, May 1999.*
- Gonzalez, J. M., R. P. Kiene and M. A. Moran.** Possible role in the DMSP/DMS cycle of a numerically important group of bacteria in the alpha-subclass of the Proteobacteria. *American Society for Limnology and Oceanography Meeting, Santa Fe, New Mexico, February 1999.*
- Graham, W. M.** 1999. Evidence for phylogenetic constraints of the cnidarian body plan on jellyfish growth rates: a new
- Undersea Research Center, UNCW project 95-FKNMS-9701. 12p.
- Pennock, J. R., T. S. Hopkins, R. A. Schreiber, B. A. Gaza and F. Blythe.** 1999. Weeks Bay Data Report: WB-1 to WB-38 Cruises (June 1990 - August 1992). *DISL Technical Report No. 99-002.* 123p.
- Pennock, J. R., W. W. Schroeder, J. C. Lehrter, J. L. W. Cowan and F. Blythe.** 1999. Mobile Bay Data Report: MB-35 to MB-58 Cruises (July 1993 - August 1995). *DISL Technical Report No. 99-001.* 80p.
- Schroeder, W. W.** (Contributor). 1998. Review of the Minerals Management Services fiscal years 1998-2001 *Environmental Studies Plans for the deepwater Gulf of Mexico, A Report from the Deepwater Subcommittee to the Outer Continental Shelf Scientific Committee, Minerals Management Service, 8 p.*
- Schroeder, W. W.** 1998. Past and present university marine research in DeSoto Canyon. *Proceedings: Seventeenth Annual Gulf of Mexico Information Transfer Meeting, New Orleans, LA, December 1997. OCS Study MMS 99-0042, Pp. 277-283.*
- Stout J. P., K. L. Heck, Jr., J. F. Valentine, S. J. Dunn and P. M. Spitzer.** 1998. Preliminary characterization of habitat loss: Mobile Bay National Estuary Program. *Mobile Bay National Estuary Program. 179 Pages.*
- Wallace, R. K., J. J. Bachant, J. C. Howe, R. Pavek, M. Dardeau and M. VanHoose.** 1999.

Resident Research Faculty

Richard B. Aronson, Ph.D. 1985. (Harvard University). Senior Marine Scientist. Ecology and paleoecology of disease outbreaks on coral reefs. Climate change and community paleoecology in Antarctica.



Dr. Jim Cowan (left) examining a plankton net while on Weeks Bay (Photo by Jon Pennock)

James H. Cowan, Jr., Ph.D. 1985. (Louisiana State University). Senior Marine Scientist. Recruitment dynamics of marine and estuarine fishes with emphasis on early life stages, their transport in shelf waters, associations with river plume fronts and other linear oceanographic features, and predator-prey interactions as applied to the "single process."

George F. Crozier, Ph.D. 1966. (Scripps Institution of Oceanography, UCSD). Senior Marine Scientist and Executive Director, DISL. Active on most of the state and regional technical planning groups and involved in translating basic research into the real world of coastal resource management.

Michael R. Dardeau, M.S. 1982. (University of South Alabama). Marine Scientist. Focuses on taxonomy, community structure and ecological relationships of marine invertebrates. Involved in the issues of secondary productivity and food web interactions in both soft and hardbottom communities.

John J. Dindo, Ph.D. 1991 (University of Alabama at Birmingham). Senior Marine Scientist and Chair, Discovery Hall Programs. Interests include marine vertebrate ecology; avian breeding biology; predator-prey relationships in avian and herpetological fauna, habitat assessments; and age, size class and recruitment rates of fish on hardbottoms.

William 'Monty' Graham, Ph.D. 1994. (University of California, Santa Cruz). Senior Marine Scientist. Physical and behavioral mechanisms that cause plankton to be distributed in patches. Also interested in processes that influence the formation and fate of detrital particles known as "marine snow."

Kenneth L. Heck, Ph.D. 1976. (Florida State University). Senior Marine Scientist. Efforts focus on ecological studies of seagrass-associated macrofauna, especially shrimps, crabs and fishes. Current studies include assessment of seagrass nursery value and rates of secondary production and investigations of herbivory nutrients and bioturbation as they influence the size and growth of seagrass meadows.

Ronald P. Kiene, Ph.D. 1986. (SUNY Stony Brook). Senior Marine Scientist. Biogeochemical cycling of organic matter in coastal and ocean systems with emphasis on compounds containing sulfur and nitrogen. Cycling of radiatively important trace gases in relation to phytoplankton and food web dynamics. Microbial ecology and biogeochemistry in sediments.

Jonathan R. Pennock, Ph.D. 1983. (University of Delaware). Senior Marine Scientist and Chair, University Programs. Interests focus on the interactions of estuarine and near-coastal plankton and their physical and chemical environments; estuarine nutrient biogeochemistry; remote sensing of coastal processes and harmful algal blooms.

William W. Schroeder, Ph.D. 1971. (Texas AM University). Senior Marine Scientist. Interdisciplinary oceanography focusing on the characterization of continental margin environments/habitats; estuarine and shelf hydrography and circulation; the occurrence of hypoxia-anoxia; and the utilization of remote sensing techniques.

John F. Valentine, Ph.D. 1989. (University of Alabama). Senior Marine Scientist. Structuring mechanisms and secondary production of seagrass habitats; echinoderm ecology and systematics.



Dr. John Valentine at the podium during a lecture in Galathea Hall

- perspective on food-limitation. American Society for Limnology and Oceanography, Aquatic Sciences Meeting, Santa Fe, NM.
- Graham, W. M.** 1999. Is the Gulf of Mexico At Risk for Long-Term Increases of Jellyfish Populations? Jacksonville State University, Jacksonville, Alabama.
- Graham, W. M.** 1999. Are jellyfish blooms on the rise in coastal ecosystems? University of California-Santa Cruz.
- Graham, W. M.** 1999. Developing Collaboration Between Ocean Scientists and Science Educators: Should Old Sea Dogs Learn New Tricks? Monterey Bay Aquarium Research Institute.
- Hines, M. E., K. N. Duddleston, R. B. Reich and R. P. Kiene.** C₁ compounds are not consumed in northern wetlands. Symposium on Microbial Biogeochemistry: microbial diversity, activity, and organic matter decomposition. 9th annual V.S. Goldschmidt Conference, Cambridge, MA, USA August 23-27, 1999.
- Hines, M. E. and R. P. Kiene.** Controls on the emission of dimethylsulfide from freshwater wetlands. Am. Soc. Limnology & Oceanography Meeting, Santa Fe, New Mexico, February 1999.
- Hixon, S. J. and W. M. Graham.** 1999. Respiratory response of the moon jellyfish *Aurelia aurita* to pulsed food. American Society for Limnology and Oceanography, Aquatic Sciences Meeting, Santa Fe, NM.
- Keller, M. D., P. M. Matrai, and R.P. Kiene.** Dynamics of DMSP and glycine betaine (GBT) in coastal phytoplankton populations in response to nitrogen additions. Am. Soc. Limnology & Oceanography Meeting, Santa Fe, New Mexico, February 1999.
- Kiene, R. P. and L. Linn.** Assimilation of DMSP-sulfur into the protein fraction of marine bacterioplankton. American Society for Limnology and Oceanography Meeting, Santa Fe, New Mexico, February 1999.
- Kiene, R. P., L. J. Linn and J. A. Bruton.** New and important roles for DMSP in marine microbial communities. Second International Symposium on DMSP and related sulfonium compounds, Groningen, The Netherlands, August, 1999.
- Kirsch, K. K., J. F. Valentine and K. L. Heck, Jr.** 1998. Herbivory on *Thalassia testudinum* by fish in the Florida Keys. University of South Alabama, 5th Research Council Forum.
- Kirsch, K. D., J. F. Valentine and K. L. Heck, Jr.** 1999. Seagrass consumption by herbivorous fish: an underestimated trophic pathway in Florida Keys national marine sanctuary. 1999 International Estuarine Research Federation New Orleans, LA.
- Kirsch, K. D., J. F. Valentine and K. L. Heck.** 1999. Seagrass consumption by herbivorous fish: an underestimated trophic pathway in the Florida Keys National Marine Sanctuary. Benthic Ecology Meetings. Baton Rouge, Louisiana.
- Kolesar, S. E., D. L. Breitbart, K. A. Rose and J. H. Cowan, Jr.** The influence of hypoxia on the ctenophore *Mnemiopsis leidyi*: A behavior and predation on *Gobiosoma boscii* larvae. Annual Meeting of the American Society of Limnologists and Oceanographers, Santa Fe, NM, February 1999.
- Lehrter, J. C., J. R. Pennock and J. L. W. Cowan.** 1999. Carbon, nitrogen and phosphorus dynamics in a pulsed river-dominated estuary: Mobile Bay, Alabama (USA). ASLO Winter Meeting, Santa Fe, NM.
- Linn, L. J. and R. P. Kiene.** The fate of DMSP sulfur in seawater from the Gulf of Mexico: Tracer studies with ³⁵S-labeled DMSP and DMS. Am. Soc. Limnology & Oceanography Meeting, Santa Fe, New Mexico, February 1999.
- Lopez, R. C. and J. R. Pennock.** 1999. Estimating transport of river-borne materials to northern Gulf of Mexico shelf waters using SEAWiFS satellite imagery. ERF Biennial Meeting, New Orleans, LA.
- McCawley, J. R., J. H. Cowan, Jr. and R. L. Shipp.** A bioenergetics approach for estimating prey demand by red snapper (*Lutjanus campechanus*) on Alabama artificial reefs. Proc. 52nd Gulf and Caribbean Fisheries Institute. Key West, FL, November 1999.
- O'Neal, J. P., J. H. Cowan, Jr. and L. A. Fuiman.** Does immersion in alizarin complexone dihydrate affect behavior of individual red drum larvae? Proc. 23rd Annual Meeting of the Early Life History Section of the American Fisheries Society, Beaufort, NC, April 1999.
- Pennock, J. R.** The Regulatory Role of Biogeochemical Processes in Estuarine Eutrophication: Examples from the Northern Gulf of Mexico. EPA Gulf Ecology Division Laboratory, Gulf Breeze, FL; January, 1999.
- Precht, W. F. and R. B. Aronson.** 1998. Society for Integrative and Comparative Biology Annual Meeting, Boston, MA. Disease, disturbance and the changing face of Caribbean coral reefs.
- Precht, W. F. and R. B. Aronson.** 1999. Improving decision-making in coral reef restoration. Geological Society of America Abstracts with Programs 31(3):A60.
- Precht, W. F. and R. B. Aronson.** 1999. National Coral Reef Institute International Conference on Scientific Aspects of Coral Reef



Ph.D. candidate Brad Peterson (advisor Dr. Ken Heck) at his oral presentation of his dissertation, "Interactions between a semi-infaunal suspension feeding bivalve, *Modiolus americanus*, and seagrass assemblages, *Thalassia testudinum*," at the University of South Alabama

- Assessment, Monitoring, and Restoration, Fort Lauderdale, FL. Compositional changes in reef sediments related to changes in coral reef community structure.
- Precht, W. F. and R. B. Aronson. 1999. Geological Society of America Southeastern Section Meeting, Athens, GA. Improving decision making in coral reef restoration.
- Precht, W. F. and R. B. Aronson. 1999. Marine Benthic Ecology Meeting, Baton Rouge, LA. Catastrophic mortality of corals in the Belizean shelf lagoon associated with the 1998 bleaching event.
- Rose, K. A. and J. H. Cowan, Jr. Predicting fish population dynamics: compensation and the importance of site-specific considerations. EPRI Technical Conference, Atlanta, GA, April 1999.
- Schroeder, W. W. 1998. Physical processes, water chemistry and biological regimes. ECSA Bulletin 29:30-31.
- Schroeder, W. W. 1999. Aboard the TE VEGA: Research in the South Pacific in the '60's. DISL Public Lecture Series, Mobile, AL; April, 1999.
- Schroeder, W. W. 1999. Stratification-destratification cycles in a shallow, microtidal, coastal plain estuary: potential consequences of climate change. ECSA 30, Impact of Climate Change on the Coastal Zone, Hamburg, Germany, August 10-13, 1999.
- Schroeder, W. W., S. P. Volovik, I. A. Nicolayev, A. L. Chikin, L. A. Krukier and A. I. Sukhinov. 1998. The response of the Azov Sea to changes in river inflow. ECSA Bulletin 29:55-56.
- Sharp, W. C., W. J. Kenworthy, J. H. Hunt, W. G. Lyons, C. Rose, E. J. Prager, J. F. Valentine, J. W. Fourqurean and P. Whitfield. 1999. The short term impacts of overgrazing in a seagrass meadow by the urchin *Lytechinus variegatus* in the Florida Keys. Benthic Ecology Meetings. Baton Rouge, Louisiana.
- Spitzer, P. M., K. L. Heck, Jr. and J. F. Valentine. 1999. Larval supply, post-settlement mortality, and the size of blue crab populations: an experimental assessment. 1999 International Estuarine Research Federation, New Orleans, LA.
- Spitzer, P., K. Heck and J. Valentine. 1999. Larval supply, post settlement

- mortality, and the size of blue crab populations: an experimental assessment in Alabama coastal waters. Benthic Ecology Meetings. Baton Rouge, Louisiana.
- Strelcheck, A. J. and J. H. Cowan, Jr. Reef fish demographics on artificial reefs: the influence of reef design and location. Proc. 52nd Gulf and Caribbean Fisheries Institute. Key West, FL, November 1999.
- Stumpf, R. P., R. Arnone, R. Steward, J. R. Pennock, K. Carder, P. Tester and C. Tomas. 1999. SEAWIFS algorithms for application to turbid coastal waters of the US Southeast and Gulf of Mexico. ASLO Winter Meeting, Santa Fe, NM.
- Stumpf, R. P., V. Ransibrahmanakul, P.



Dr. Monty Graham (l) and Marine Technician Al Gunter (r) prepare a Niskin bottle to collect water samples while on the R/V A.E. Verrill.

- Tester, R. G. Steward, K. Carder, J. R. Pennock, A. Subramaniam and C. Tomas. 1999. Remote sensing of chlorophyll and suspended solids along the US southeast coast from SEAWiFS. ERF Biennial Meeting, New Orleans, LA.
- Valentine, J. F. and K. L. Heck, Jr. 1999. Seagrass herbivory: evidence that grazing on marine angiosperms is widespread and greatly underestimated. 1999 International Estuarine Research Federation, New Orleans, LA.

- Valentine, J. F. and K. L. Heck, Jr. 1999. Seagrass herbivory: additional evidence that grazing on marine angiosperms has been greatly underestimated. Benthic Ecology Meetings. Baton Rouge, Louisiana.
- Woods, M. K. and J. H. Cowan, Jr. Growth and reproductive biology of red snapper (*Lutjanus campechanus*) east and west of the Mississippi River: preliminary data testing the unit stock hypothesis. Proc. 52nd Gulf and Caribbean Fisheries Institute. Key West, FL, November 1999.
- Zinsmeister, W. J., D. B. Blake and R. B. Aronson. 1998. Geological Society of America North-Central Section Meeting, Columbus, OH. A bivalve (*Cucullea* spp.) predation pattern across the K-T interval, Seymour Island, Antarctic Peninsula. Regional meeting.
- Zubkov, M. L. J. Linn and R. P. Kiene. Turnover of DMS and DMSP during a phytoplankton bloom cycle. Second International Symposium on DMSP and related sulfonium compounds, Groningen, The Netherlands, August, 1999.

Invited Presentations

- Aronson, R. B. 1998. Brown University (December).
- Aronson, R. B. 1999. Smithsonian Institution, National Museum of Natural History (March).
- Aronson, R. B. 1999. Cosmos Club, Washington, DC (March).
- Aronson, R. B. 1999. Rosenstiel School of Marine and Atmospheric Science, University of Miami (April).
- Aronson, R. B. 1999. Belize Coastal Zone Management Programme, Belize City (June).
- Aronson, R. B. 1999. The Natural History Museum, London (July).
- Aronson, R. B., W. F. Precht and I. G. Macintyre. 1999. 11th Bathurst Meeting, University of Cambridge, UK (July); Invited presentation for Coral Reef Session: Disease and the changing face of Caribbean coral reefs.
- Aronson, R. B. and W. F. Precht. 1999. National Coral Reef Institute International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring, and Restoration, Fort Lauderdale, FL (April); Special Session, The Limits of Detectability: Short-Term Events and Short-Distance Variance in the Community Structure of Coral Reefs; including Introduction and

- Concluding Statement; Scales, Hypotheses, and the Limits of Detection in the Ecology and Management of Coral Reefs.
- Cowan, J. H., Jr.** Invited Participant, Workshop on Quantification and Modeling of Higher Trophic Levels in Chesapeake Bay, Co-sponsored by Army Corps of Engineers and the Chesapeake Bay Program, Annapolis, MD, May 18-20, 1999.
- Cowan, J. H., Jr.** Population dynamics, energetics and movement of red snapper on Alabama artificial reefs. Biology Seminar Series, University of California, Santa Cruz. November, 1999.
- Cowan, J. H., Jr.** Individual-based models of predator/prey interactions in larval marine fishes. National Marine Fisheries Service, Southwest Fisheries Science Center, Tiburon Laboratory, November 1999.
- Cowan, J. H., Jr.** Predation on larval marine fishes: empirical results and model simulations. Natural History Seminar, State University of New York, Stony Brook. April, 1999.
- Cowan, J. H., Jr.** Predation mortality: perspectives from 10 years of killing baby fishes. Invited Lectures in Fisheries Science, Gulf Coast Research Laboratory, Ocean Springs, MS. October 1998.
- Cowan, J. H., Jr.** Population biology of striped bass as a framework for a genetics workshop. Keynote address—A Workshop: Genetics in the Toolbox for the Management of Striped Bass, Southern Division, American Fisheries Society, Columbia, SC. November, 1998.
- Graham, W. M.** 1999. Invited Guest Speaker for USA Office of Sponsored Programs, Developing CAREER proposals at USA.
- Kiene, R. P.** Invited speaker. Second International Symposium on Biological and Environmental Chemistry of DMS(P) and Related Compounds, Groningen, The Netherlands.
- Kiene, R. P.** University of South Alabama, College of Medicine, Department of Microbiology – March 1999.
- Kiene, R. P.** University of South Alabama, Department of Chemistry - March, 1999.
- Murdoch, T. J. T. and R. B. Aronson.** 1999. National Coral Reef Institute International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring, and Restoration, Fort Lauderdale, FL (April); Special Session, The Limits of Detectability: Short-Term Events and Short-Distance Variance in the Community Structure of Coral Reefs. Variability of coral assemblages on multiple scales: implications for reef management.
- Precht, W. F. and R. B. Aronson.** 1999. National Coral Reef Institute International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring, and Restoration, Fort Lauderdale, FL (April); Special Session, Decision-Making in Coral Reef Restoration; Improving decision-making in coral reef restoration.
- Precht, W. F. and R. B. Aronson.** 1999. American Society of Limnology and Oceanography Annual Meeting, Santa Fe, NM (February); Special Session on New Developments in Marine and Freshwater Epidemiology; Disease, human activity and the changing face of Caribbean coral reefs.
- Schroeder, W. W.** 1998. Paleoenvironments, topographic features, and late Quaternary sea level and climate variability. CSIRO Marine Research/Antarctic CRC Seminar Series, University of Tasmania, Hobart, Tasmania, July 30, 1998.
- Schroeder, W. W., I. A. Nicolayev, S. P. Volovik, Wm. J. Wiseman, Jr., A. L. Chikin, A. I. Sukhinov and L. A. Krukier.** 1998. Aspects of the oceanography of the Azov Sea. 9th Conference on Physics of Estuaries and Coastal Seas, Ehima University, Matsuyama, Japan, September 24-26, 1998.
- Schroeder, W. W.** 1998. Mississippi-Alabama marine ecosystem monitoring study: Geological characterization. 18th Information Transfer Meeting, MMS Gulf of Mexico, OCS Region. Kenner, LA, December 8-10, 1998.
- Schroeder, W. W.** 1999. Sources of suspended sediments in microtidal estuarine and coastal waters: Northeastern Gulf of Mexico. ERF 15th Biennial International Conference, New Orleans, LA, September 25-30, 1999.
- Swanson, D. W., R. B. Aronson and S. L. Miller.** 1999. National Coral Reef Institute International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring, and Restoration, Fort Lauderdale, FL (April); Special Session, Decision-Making in Coral Reef Restoration; Ship groundings in the Florida Keys: implications for reef ecology and management.

Meetings Organized

Kiene, R. P. Organizational Advisor, Second International Symposium on Biological and Environmental Chemistry of DMS(P) and Related Compounds, Groningen, The Netherlands.

Sessions Chaired/ Convened

Aronson, R. B. 1999. National Coral Reef Institute International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring, and Restoration, Fort Lauderdale, FL; Special Session, The Limits of Detectability: Short-Term Events and Short-Distance Variance in the Community Structure of Coral Reefs.

Cowan, J. H., Jr. and W. M. Graham. Co-Convenors, Theme Session on Bioenergetics of Pelagic Animals, Annual Meeting of the American Society of Limnologists and Oceanographers, Santa Fe, New Mexico, Winter 1999.

Kiene, R. P. Co-Organizer, Special Session on Organic Sulfur in Aquatic Environments, ASLO, Santa Fe, NM, Feb 5, 1999.

Grants & Contracts Active During 1998-1999

Aronson, R. B. et al. NOAA Florida Keys National Marine Sanctuary (1997-1999); The No-Take Zones of the Florida Keys National Marine Sanctuary: an interdisciplinary, comparative study of the dynamics of coral reef benthic communities. Principal Investigator in 4-investigator team; \$152,000.

Aronson, R. B. National Science Foundation Geology and Paleontology Program (1999); Disturbance and the Reorganization of Caribbean Reef Communities: Unique Event or Repeated Pattern? Principal Investigator. \$235,000.

Aronson, R. B. National Science Foundation Biological Oceanography Program (1999); SGER: Local

MARINE ENVIRONMENTAL SCIENCES CONSORTIUM
Dauphin Island, Alabama
Balance Sheet
September 30, 1999

Assets	Current Year	Liabilities and Fund Balances	Current Year
<u>Current Funds</u>		<u>Current Funds</u>	
<u>Unrestricted</u>		<u>Unrestricted</u>	
Cash	\$1,071,597.39	Accrued liabilities	\$192,790.43
Accounts receivable	66,343.48	Fund Balance	1,050,421.15
Inventories	105,270.71		
Total Unrestricted	1,243,211.58	Total Unrestricted	1,243,211.58
<u>Restricted</u>		<u>Restricted</u>	
Cash	102,074.25	Accounts receivable	279.91
Accounts receivable	441,139.48	Due from Other Funds	9,609.22
Due from Other Funds	9,609.22	Total Restricted	552,822.95
Total Restricted	552,822.95	Total Current Funds	1,796,034.53
Total Current Funds	1,796,034.53		
<u>Plant Fund</u>		<u>Plant Fund</u>	
<u>Investment in Plant</u>		<u>Investment in Plant</u>	
Land	658,757.00	Leasehold Payable	2,000,000.00
Buildings and Improvements	6,328,151.91	Net Investment in Plant	7,326,961.78
Improvements Other than Buildings	40,450.57		
Equipment	1,508,128.13		
Vessels	231,921.47		
Library Books and Audiovisuals	533,678.73		
Construction in Progress	25,873.97		
Total Investment in Plant	9,326,961.78	Total Investment in Plant	9,326,961.78
Total Plant Funds	9,326,961.78	Total Plant Funds	9,326,961.78
<u>Agency Funds</u>		<u>Agency Funds</u>	
Cash	48,738.49	Obligations to Others	21,524.09
Accounts Receivable	560.00	Fund Balance	49,298.49
Property Rights Held	21,524.09		
Total Agency Funds	70,822.58	Total Agency Funds	70,822.58



