


Winter 1997

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NSU Oceanographic Center

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## NSUWorks Citation

NSU Oceanographic Center, "Winter 1997" (1997). *Currents*. 50.  
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# Currents



Winter 1997 • Volume XI, Number 1

## It's Another Record Year for Sea Turtle Nesting

The numbers are in, and nests are up again. **Dr. Curtis Burney**, principal investigator for the Center's Broward County Sea Turtle Conservation Program, and former student **Bill Margolis**, project manager, have submitted their annual report to Broward County's Department of Natural Resource Protection (DNRP) for the 1996 turtle season. The report shows that the three species of sea turtles monitored, loggerheads, greens, and leatherbacks, have produced another record number of nests at 2,810, up from 1995's 2,634 nests.

According to Dr. Burney, 1996 was the third consecutive year that showed an overall increase. "The trend is up," he states. "There was nothing unusual about the year. We had the usual predation by foxes, raccoons, even ants. There were also the usual poaching problems, but really only a few cases."

The DNRP has monitored sea turtle nesting activity in the county since 1978. Of the species investigated, loggerheads (*Caretta caretta*) are listed as threatened, while greens (*Chelonia mydas*) and leatherbacks (*Dermochelys coriacea*) are listed as endangered under the U.S. Endangered Species Act. Thus, it has been the primary responsibility of Center scientists and student workers to relocate eggs from threatened nests to maximize hatchling recruitment. Endangered nests are defined as those located within 20 feet of the previous evening's wrack line, those located near a highway or artificially lighted beach area, and those located in an area subject to beach renourishment.

The following charts (see page 2)

show the historical trends in sea turtle nesting patterns, as well as total egg counts for the three species in 1996. Dr. Burney points out that "there were 10,585 eggs from 87 predated *C. caretta* nests and 271 eggs from two predated *C. mydas* nests that were not included in the totals. In addition, there were 5,737 eggs from 53 *C. caretta* nests and 428 eggs from four *C. mydas* nests, which were not evaluated due to marker removal." He also notes that none of the leatherback eggs hatched this year, for reasons unknown.

The ongoing upward trend in the

number of nests "continues to suggest that either the female population has increased or that individual loggerheads are nesting more frequently or depositing more clutches per female in nesting seasons," Dr. Burney reports. "Both loggerheads and greens may lay their eggs three or four times during one season." He further notes that the greens are showing fluctuations again, as seen in the peaks and valleys on their chart. "A large percentage of the nesting females appear to be nesting every other year. Three such cycles have been completed since 1989, and a



Bill Margolis and Dr. Curtis Burney.

(Continued on Page 2)

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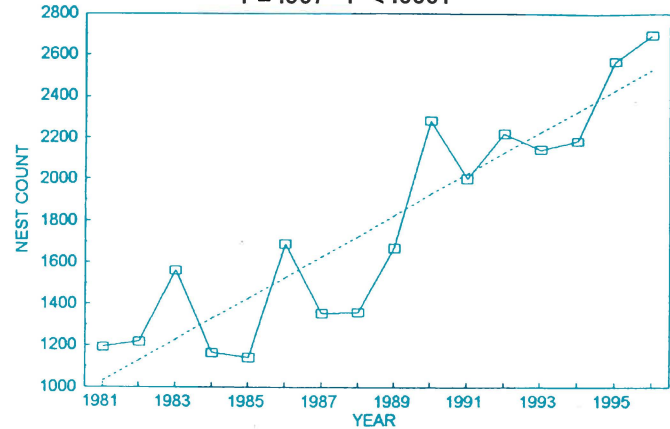
fourth one may have started this year. We don't see it in loggerheads, and we don't have enough data about leatherbacks."

Dr. Burney concludes that the "use of mass egg relocation as a sea turtle management tool is far from a perfect conservation technique. Such an invasive procedure employed on such a large scale may inherently result in slightly reduced hatching success.... Clearly, it would be preferable, and much less costly, to leave far more nests *in situ*, but we are forced to relocate most nests primarily to avoid hatchling take due to misorientation by coastal artificial lighting."

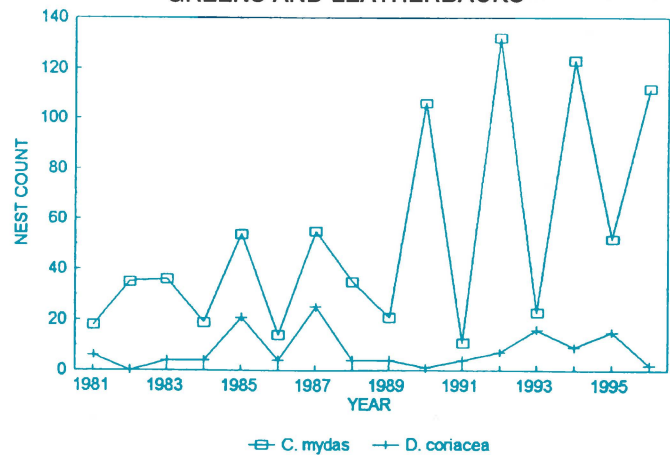
Our turtle conservation workers once again attempted to educate the public as to the objectives of the project. Flyers were distributed on the beach and at beachfront establishments, as well as at the Center. Public slide presentations were given every week from July 7 through August, followed by hatchling releases in Hollywood. Two special presentations were conducted at the Center for high school students, followed by hatchling releases in Lloyd Beach State Park. Public talks and slide shows also were given at several area elementary schools and for a number of local organizations. 🐢

## BROWARD LOGGERHEAD NESTS

$r = .907$   $P < .0001$

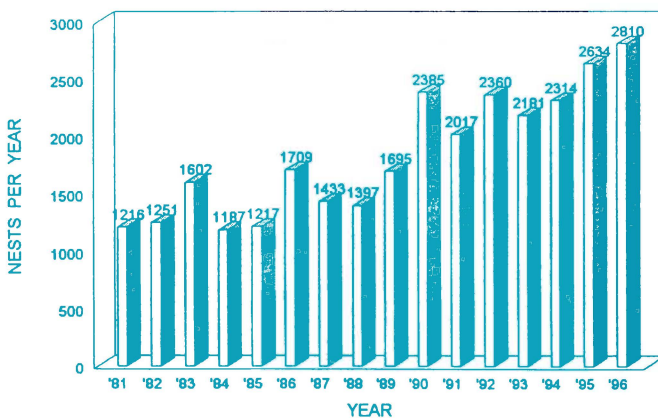


## TOTAL BROWARD NESTS GREENS AND LEATHERBACKS



Historical trend in total number of sea turtle nests deposited in Broward County since 1981.

## SEA TURTLE NESTING HISTORY ALL SPECIES COMBINED



Historical nesting patterns of loggerhead, green, and leatherback sea turtles in Broward County since 1981.

SPECIES	NUMBER OF EGGS	n*	HATCHLINGS RELEASED	HATCHING SUCCESS (%)
<b>In situ Nests</b>				
<i>C. caretta</i>	35549	374	27466	77.3
<i>C. mydas</i>	3195	27	2692	84.3
<i>D. coriacea</i>	0	0	-	-
Total	38744	401	30158	77.8
<b>Relocated Nests</b>				
<i>C. caretta</i>	175206	1624	119630	68.3
<i>C. mydas</i>	2758	23	1774	64.3
<i>D. coriacea</i>	91	1	0	0
Total	178055	1648	121404	68.2
<b>Overall</b>				
<i>C. caretta</i>	210755	1998	147096	69.8
<i>C. mydas</i>	5953	50	4466	74.8
<i>D. coriacea</i>	91	1	0	0
Total	216799	2049	151562	69.9

\* n = The number of nests actually investigated for hatching success percent.

Total egg counts, released hatchlings, and overall hatching successes for in situ and relocated nests in 1996.





*Dr. James Thomas sets up his laboratory.*

## Dr. James Thomas Joins Center Faculty

On December 1, marine biologist **Dr. James Thomas** joined the Oceanographic Center faculty as an Associate Professor. At present he is busily engaged in performing ongoing research, writing research proposals, and teaching undergraduate science courses.

Dr. Thomas came to us from the National Museum of Natural History, which is part of the Smithsonian Institution in Washington, DC. He worked there for the past five years as Curator of Crustaceans. A primary achievement was establishing a program-level research project, attempting to identify and inventory reefs of particular scientific interest. He was involved in many policy-related marine research projects as well. For instance, he established cooperative agreements with the governments of Mexico and Papua New Guinea, having the objectives of studying coral reef biodiversity and training scientists in those regions.

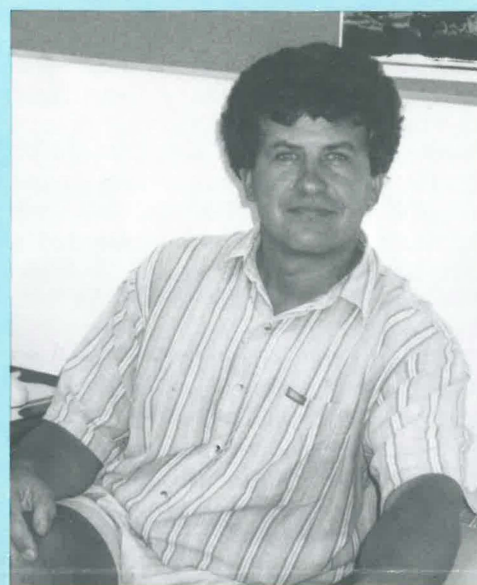
Prior to his stint at the Smithsonian, from 1987 to 1992 Dr. Thomas was Research Director at the Reef Foundation in the Florida Keys. The basic research accomplished there involved assessing and describing biodiversity in terms of animal life. "The focus of our research was in the southern hemisphere—Papua New Guinea and Australia's Great Barrier Reef. We

## Dr. Soloviev Conducts Research in Physical Oceanography

**Dr. Alexander Soloviev**, who joined the Center faculty on July 1, came to us from the University of Hawaii in Honolulu. He spent the summer there completing the observational phase of his research, but now he is settled in and continuing his research in physical oceanography here at the Oceanographic Center.

Dr. Soloviev has a joint three-year grant from the National Science Foundation and the Office of Naval Research as part of the TOGA/COARE (Tropical Ocean Global Atmosphere/Coupled Ocean-Atmosphere Response Experiment) program. His contribution to the project has been to study the small-scale structure of the near-surface layer of the ocean. The area of concentration is the western Pacific equatorial region. Unlike most of our Center's land-bound physical oceanographers, he performed four one-month observational studies at sea during the 1992-94 field program. The research vessels used were the *Moana Wave* and the *Le Noroit*.

Dr. Soloviev now has settled in front of his computer to analyze the data collected during the field program, and to write papers documenting his findings. He will continue to do this work in



*Dr. Alexander Soloviev at the computer.*

cooperation with the Department of Oceanography at the University of Hawaii.

"I am trying to parameterize small-scale processes for improving boundary conditions in global circulation models," he explains. "My next proposed work will be on the connection between the fine thermohaline structure, gas exchange and biology of the near-surface layer of the ocean." This study will entail both observations and computer modeling, and will cover a period of several years. 🐡

collected amphipod samples," he explains. "I also teach a month-long coral reef course on the Great Barrier Reef, as well in the Keys."

Currently Dr. Thomas has some funding in cooperation with the University of Maine and Old Dominion University. He is also studying populations of marine invertebrates living on mooring lines that connect the buoys to coral reefs off the Keys. He now plans to attract funding for research having a more regional focus. "I will still study marine invertebrates, primarily amphipods," he states, "and develop them as indicator species. I would like to set up a program here that allows us to do research as well as train people in assessing biodiversity in temperate/tropical marine systems." Such a project

would involve both students and faculty and serve a much-needed function for the scientific community. "This would be a five-year program to train graduate students to be coral reef taxonomists and to conduct research. The field work would involve various areas in the state, the Caribbean, and the Southern Hemisphere."

Dr. Thomas jumped off to a fast start in January, taking on undergraduates in the Center's Joint Science Program with NSU's Farquhar Center. There he teaches Introduction to Oceanography for oceanography majors, and The Living Earth, which is a core science course for non-majors. At some point he no doubt will be teaching graduate courses here at the Center—in his spare time. 🐡



## People on the Move

**Dr. Julian McCreary**, Dean, traveled to Japan once again to visit several institutions from February 24 to March 8. He attended a symposium at the Tohoku National Fisheries Research Institute in Sendai and presented a talk on February 28 titled "A Four-component Ecosystem Model of Biological Activity in the Arabian Sea." [The Institute presented the Research Award for Foreign Specialists to Dr. McCreary and provided his travel costs.] He also attended a "mini-symposium" on the "Interaction of the Pacific Subtropical and Subpolar Gyres," in which a number of U.S. scientists participated. There, he presented a seminar titled "On the Exchange of Upper-Ocean Water between the Subtropical and Subpolar Gyres in the Pacific Ocean."

On March 2, Dr. McCreary traveled north to Hokkaido University in Sapporo to visit **Dr. Yasushi Fukamachi**, who studied under Dr. McCreary and received the Ph.D. degree in physical oceanography through the Oceanographic Center several years ago. There he presented the talk on subtropical and subpolar gyres. Then he visited **Dr. Toshio Yamagata** at the University of Tokyo, where he gave the mini-symposium talk again on March 6.

**Dr. Barry Klinger** attended part of a weeklong conference, held February 10-13 at the University of Miami (RSMAS), titled Miami Isopycnic Coordinate Ocean Model (MICOM). MICOM is a computer model developed at RSMAS for simulating the circulation in the world ocean or in individual sub-basins.

During February 25-27, Ph.D. candidate **David Gilliam** and M.S. student **Robin Sherman** attended the 17th Annual Meeting of the Florida Chapter of the American Fisheries Society, held at Withlacoochee Training Center at Brooksville. They gave a student presentation titled "Artificial Reef Studies of Broward County," co-authored by **Ken Banks** of the Broward County Department of Natural Resource Planning, and Center faculty member and student advisor **Dr. Richard Spieler**.

From June 26 to July 2, **Dr. Mahmood Shivji** and two of his graduate students will attend a conference in Seattle, co-sponsored by the American

Society of Ichthyologists and Herpetologists and the American Elasmobranch Society. He will present a talk titled "Structure and Evolution of Group I Introns in Sharks." **Brenda Ertan** will give a talk titled "Global Genetic Structure in Blue Sharks," and **Elizabeth Lu** will present a poster titled "Evolution of ITS1 in Groupers."

On November 15, **Dr. Deborah Weissman-Berman**, Center Research Scientist, presented an invited seminar at the University of Florida's Department of Aerospace Engineering, Mechanics and Engineering Science in Gainesville. Her seminar was titled "Flexural Response of Sandwich Plates with Core as Elastic Foundation." 🐡

## Dr. Weissman-Berman Is Honored

**Dr. Deborah Weissman-Berman**, Research Scientist, has been nominated for *Who's Who in Science and Engineering 1996* by Marquis Publishing. She also was nominated for Woman of the Year 1996 by the American Biographical Institute. She has been invited to submit her vita for publication in the 12th edition of *The International Who's Who of Intellectuals*, to be published early this year by the International Biographical Centre in Cambridge, England, and for which she will receive a certificate of commemoration. 🐡

## SEMINARS

Several seminars and thesis defenses were held at the Oceanographic Center in the past few months. They included:

December 9: "The Relationship between the Hydrodynamic Environment, the Food Environment, and the Fitness of the Copepod, *Acartia tonsa*," Thesis Proposal Defense presented by M.S. candidate **Sue Finkle**.

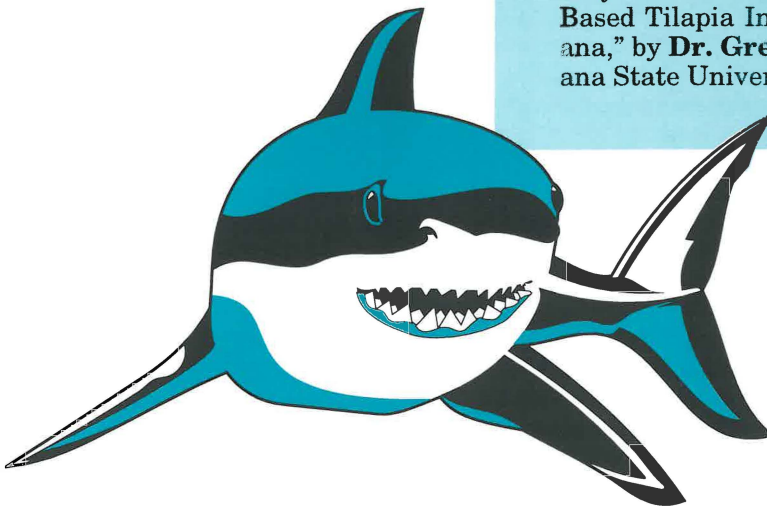
December 13: "Factors Affecting *Rhizophora mangle* (Red Mangrove) Recruitment in Florida," Capstone Review Paper presented by M.S. candidate **Kathy Baier**. Committee: **Drs. Bart Baca** and **Curtis Burney**.

December 20: "Skeletal Architectural Variability as Basis of Density Banding in the Reef Coral *Montastrea annularis*," Capstone Review Paper presented by M.S. candidate **Rowena Garcia**. Committee: **Drs. Richard Dodge** and **Curtis Burney**.

January 3: "A Mammalian Growth-releasing Factor: Its Implications for Growth and Reproduction in Teleosts," by **Dr. Anita Kelly** of Southern Illinois University.

January 6: "Influences of Salinity on Dynamics, Thermodynamics, and Mixed-layer Physics in the Indian Ocean," Ph.D. Thesis Proposal Defense by **Weiqing Han**. Committee: **Drs. Julian McCreary** (Chm.), **Richard Dodge**, **Barry Klinger**, **Donald Olson** (RSMAS, U. Miami), **Arthur Mariano** (RSMAS, U. Miami), and **Robert Molinari** (NOAA/AOML).

January 24: "Development of a Tank Based Tilapia Industry in Louisiana," by **Dr. Greg Lutz** of Louisiana State University. 🐡





# UNDERCURRENTS

## INSTITUTE OF MARINE AND COASTAL STUDIES

### Spring Term Schedule

M.S. degree specialties are **Marine Biology** and **Coastal Zone Management**. Each course carries three credit hours or may be audited. Tuition is \$355 per credit hour (50 percent less for audit) through the Spring Term. Classes meet once a week from 6:30 to 9:30 p.m. at the Oceanographic Center. Spring term runs from April 7 to June 28, 1997. Registration (\$25 nonrefundable fee) begins two weeks prior to the start of classes. For further information, call **Helene Taylor** at (954) 920-1909.

*Marine Geology (OCOR-5604)*: A required CORE course for both degree programs. Describes the origin, form, and resources of the ocean basins and continental margins. Covers sea-floor spreading, trenches and island arcs, mountain building, coral reefs and atolls, sedimentation, ocean mining, coastal morphology, and the impact of wave action and human activity on beaches and coasts, continental shelves, and submarine canyons. Instructor: **Dr. Pat Blackwelder** (Center faculty). Begins Monday, April 7.

*Molecular Marine Biology (OCMB-7013)*: Covers theoretical and laboratory aspects of recombinant DNA techniques as applied to ecological, evolutionary, and physiological investigations of marine organisms. Instructor: **Dr. Mahmood Shivji** (Center faculty). Begins Tuesday, April 8.

*Principles of Coastal Zone Management (CZMT-0609)*: Describes the management of coastal resources, based on the principles and techniques of a diverse array of disciplines. Provides practical solutions to usage conflicts, with special attention to the coastal zone, in relation to their impact on the basic available resources. Instructor: **Mr. Stacy Myers** (Center adjunct; South Florida Water Management District). Begins Wednesday, April 9.

*Aquaculture (OCMB-6200)*: Surveys the field of aquaculture and provides direct, practical, hands-on training in the latest methods of commercial shrimp, fish, and other animal culture. Includes activities with live animals in each life history stage, and instruction in hatchery design and management, culture of larval foods, larval culture techniques, stocking and growout, disease and problems, sourcing of breeders, maturation, and marketing and finance. Species emphasized are catfish, tilapia, shrimp, and clams. Instructor: **Dr. Bart Baca** (Center adjunct). Begins Thursday, April 10.

*Biostatistics (OCMB-6091)*: A basic course on the practical applications of descriptive and inferential statistics with emphasis on principles and methods of summarizing biological data. Under discussion are measures of central tendency, dispersion, variability testing, basic concepts of probability distributions, hypothesis testing, and decision-making. Other topics include simple statistical tests, analysis of vari-

ance through factorial analysis, simple and multiple regression, and correlation. Problems are taken from ecology and aquatic toxicology. Instructor: **Dr. Gary Rand** (Center adjunct). Begins Friday, April 11.

*The 5000 Days: Environmental Futures and Human Choices (CZMT-0665)* and *Beyond 5000 Days (CZMT-0633)*: **Distance education courses**. Instructor: **Dr. Keith Ronald** (Center adjunct).

### Summer Term Schedule

The summer term extends from July 7 to September 19, 1997. Course descriptions will be published in the next issue of *Currents*.

*Marine Chemistry (OCOR-5605)*. A CORE course. Instructor: **Dr. Curtis Burney** (Center faculty). Monday.

*Taxonomy of Marine Invertebrates (OCMB-6085)*. Instructor: **Dr. Charles Messing** (Center faculty). Tuesday.

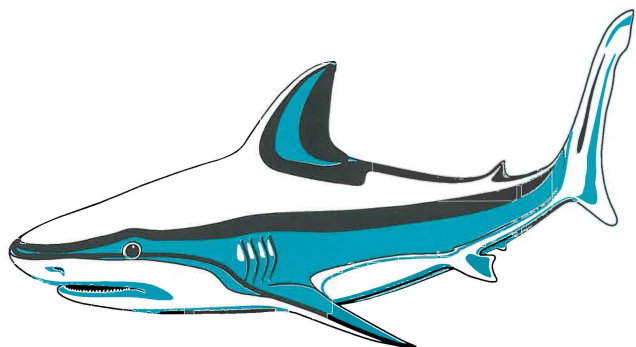
*Plankton Ecology (OCMB-5606)*. Instructor: **Dr. Gary Hitchcock** (Center adjunct). Wednesday.

*Oil Pollution Effects (CZMT-0634)*. Instructor: **Dr. Bart Baca** (Center adjunct). Thursday.

*Coastal Protection and Engineering (CZMT-0605)*. Instructor: **Dr. William Venezia** (Center adjunct). Friday.

### Ph.D. Degree Offered

The Oceanographic Center offers the Ph.D. degree in Oceanography. The program requires a minimum of 90 credits beyond the baccalaureate, 42 of which may be applied from a master's program. The remaining credits are made up of at least 48 dissertation research credits and 6 credits from upper-level course work, usually taught in the tutorial mode. Tuition is \$2,360 per quarter, through the spring term.





## Reef Fish Course Draws A Crowd

During October 20-26, **Dr. Richard Spieler** packed up his graduate students and sample bags and headed south to the Keys Marine Laboratory on Long Key. There he conducted a class called Ecology of Tropical Reef Fishes for an appreciative group who spent much of their time in small boats and at their microscopes. During the course the students collected samples and learned to identify numerous species of reef fish in Florida Bay. 🐠



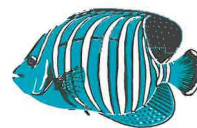
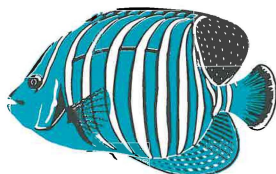
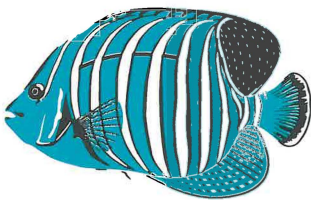
M.S. students Suzanne Piccini, Richard Hubbard, and Dan Fahy collect specimens in a Florida Bay seagrass habitat.



The class at Long Key: Tiffany Vaughn, Robin Sherman, Brian Ettinger, Susan Thornton, Carin Klein, Suzanne Piccini, Judy Robinson, and Marianas Datubara (front row); Dr. Richard Spieler, Paul Fitzgerald, Richard Hubbard, Scot Hanna, and German Mendez (back row).



Part of the class in the Long Key lab (clockwise): Carin Klein, Brian Ettinger, Paul Fitzgerald, Judy Robinson, Dan Fahy, Suzanne Piccini, and Dr. Richard Spieler. (Long Key photos courtesy of Susan Thornton.)





## Christmas Party Was a Real Treat

In mid-December, the Oceanographic Center held its annual Christmas party in and around the Richardson Library. It was organized by **Kathy Maxson** and **Melissa Dore**, as usual. And again, the food was terrific and plentiful, thanks to Publix and all of the folks who brought side dishes. 🐟



*Dr. Julian McCreary, Dean, and Jody Snyder, former staff member.*



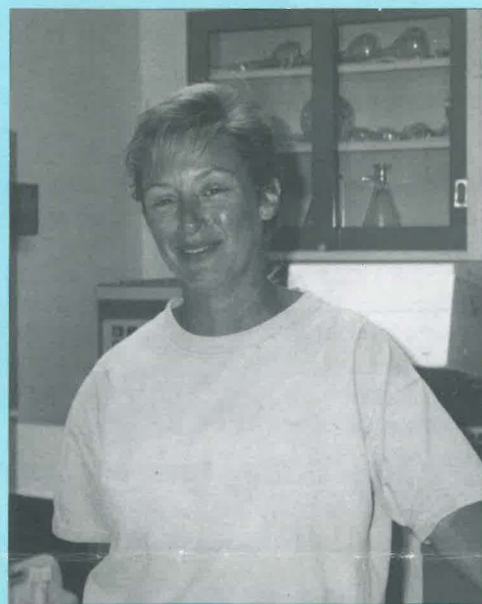
*Ruth Lazarus and Dr. Russell Snyder.*



*Dr. Charles Messing, David Gilliam, Dr. Richard Dodge, and son Nathan Dodge.*

## Robin Sherman Receives Scholarship

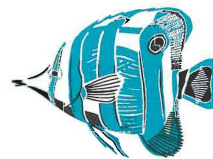
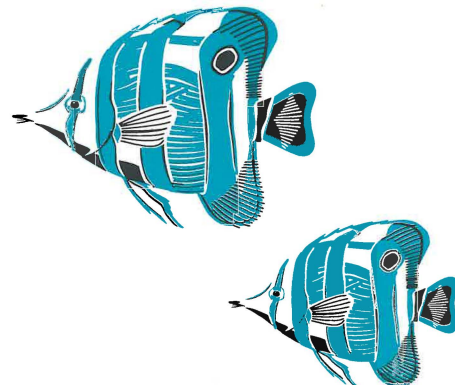
M.S. student **Robin Sherman** has been notified by the director of the Florida Sea Grant College Program, **Professor James Cato**, that she has once again been selected to receive the Aylesworth Foundation for the Advancement of Marine Sciences Scholarship Award for 1997-1999. The award will provide \$4,000 for each year of her student activity in fisheries biology, as she pursues the Ph.D. degree under the direction of **Dr. Richard Spieler**. Ms. Sherman will be formally recognized as an Aylesworth Scholarship recipient this spring or early summer during the annual meeting of the Southeastern Fisheries Association. 🐟



*Robin Sherman in the laboratory.*



*Matthew Heilman, Wade Crick, and a guest, Wade's brother.*



*Kevin Kohler.*



**Currents, Winter 1997**  
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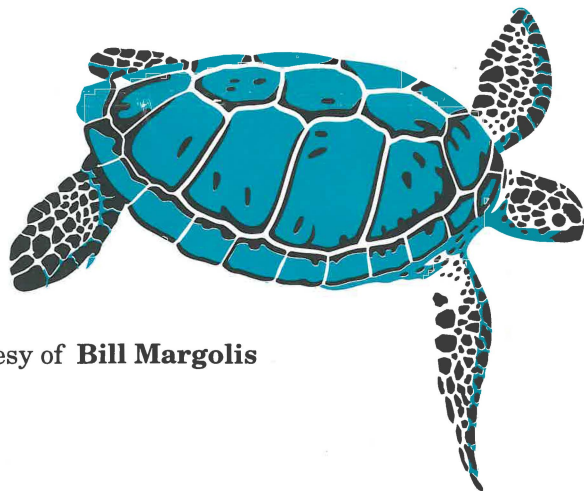
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*A loggerhead sea turtle at nesting time.*



*Newly hatched loggerheads, seeking direction.*



Editor: **Jan Witte**  
Turtle photos courtesy of **Bill Margolis**

Published quarterly by  
Nova Southeastern University  
3301 College Avenue  
Fort Lauderdale, Florida 33314-7796



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