Summer 1994

NSU Oceanographic Center

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Honda Donates ATVs for Sea Turtle Project

In July, the American Honda Motor Company donated five all-terrain vehicles (ATVs) to the Oceanographic Center for use in Broward County’s Sea Turtle Conservation Project. The heavy-duty vehicles make it possible to relocate endangered nests along the county beaches.

"The donation couldn’t have come at a better time for us," said Dr. Curtis Burney, the project’s principal investigator for the Center. A very large number of sea turtles are expected to make nests this year, and that makes it all the more difficult to keep up with the relocation task. By mid-July, the Nova project had tracked nearly 1,600 nests. "We were afraid that at the pace the turtles were going, we would run out of money and have all of our ATVs break down before the season ends," Burney added.

Before the season got underway, Burney had written to Honda and requested that the company donate five vehicles to replace the existing five that were in bad disrepair. He was astonished when Honda came through with the donation. The ATVs are four-wheel wide-tracks that have cargo space perfectly suited for hauling buckets containing intact nests from one area of the beach to another.

On July 19, Mr. W.M. Tokishi, Vice President for Corporate Community Relations of American Honda Motor Company, based in Torrance, California, presented the keys to Dr. Burney. A brief ceremony was held at the Bahia Mar Resort Hotel in Fort Lauderdale, after which the assembled group adjourned to the beach to see the ATVs in action. Mr. Tokishi was then treated to luncheon at Nova Southeastern’s main campus and took the time to tour the Oceanographic Center later in the day. Center faculty and staff were pleased to be able to express their gratitude to Mr. Tokishi for American Honda’s generous donation.

ATVs on the beach, with Steve Higgins, of Broward County; W.M. Tokishi, of American Honda; Drs. Richard Dodge and Curtis Burney, of the Oceanographic Center; and Dr. Abraham S. Fischler, former president of the University.

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Board of Governors Meets Twice

The Oceanographic Center’s Board of Governors has met twice since the last issue of Currents was published. The spring meeting was held on May 12 at Whitbread Village in Port Everglades. This was a luncheon held among the Whitbread Round the World Racers, who had stopped here during their long journey for some much-needed R & R.

Present were Board members Betty Berry, Scott Boyd, Bud Brown, Bill Darby, Richard Donato, Michael Greep, Chris Jacoby, John Peet, Ron Stroud, and Richard Wilson; Nova Development representative and organizer Patty Bourget; and Center personnel Dr. Richard Dodge, Melissa Dore, Dr. Charles Messing, Dr. Mahmood Shivji, Dr. Richard Spieler, Helene Taylor, and Jan Witte.

Dr. Dodge reported on student enrollment for FY94 and led a discussion on the Center’s potential cooperative ventures with Florida Atlantic University’s Ocean Engineering Department. Patty Bourget presented a report on the winter MIASF party that was held at the Center. Suggestions were made for increasing next year’s attendance at the function. A discussion of possible future fund-raising activities was led by Dr. Messing.

The summer Board meeting was held at the Center on July 22. Board members present were Scott Boyd, Arne Carlson, Will Connelly, Richard Donato, Chris Jacoby, Marshall Lytle, and John Peet. Patty Bourget, Bobbie Goldwire, and Leslie Brown represented Nova Southeastern’s Office of Development, and Center personnel present included Dr. Richard Dodge, Melissa Dore, Dr. Julian McCready, and Helene Taylor.

Dr. Dodge presented an update on student enrollment and other Center development activities, including a list of recent contracts and grants awarded to Center researchers. Dr. McCready announced the addition of two new faculty members in physical oceanography, who will be arriving in the fall: Dr. Barry Klinger, from the Woods Hole Oceanographic Institution and M.I.T., and Dr. Andrew Moore, from Oxford University and the Bureau of Meteorology Research Centre in Melbourne, Australia.

Leslie Brown, who was recently named Vice President for Development, introduced Bobbie Goldwire, who will replace Patty Bourget as the Center’s developmental liaison. Ms. Bourget will assume growing responsibilities in the Development Office, and Ms. Goldwire will center her attention on adding more corporate sponsorship to the Center’s set of goals.

Chairman Chris Jacoby announced the election of the Board’s new officers: John Peet, Chairman; Ron Stroud, Vice Chairman; and Richard Donato, Secretary/Treasurer. Jacoby will remain as Chair Emeritus.

Fishing Classic Funds Laboratory and Reef Project

Through the efforts of Center Board of Governors member Patricia Carr, who is Executive Director of South Florida Fishing Classic, Inc., the organization has continued its pledge to fund a marine research laboratory at the Center. Renovation of the Schure Building is nearly complete, but outfitting a laboratory is very expensive, and some areas still need help.

The Fishing Classic also has provided funds to support an artificial reef study by Dr. Richard Spieler. His research is geared toward enhancing the local fish populations, which should make supporters of the South Florida Fishing Classic very happy.

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Bill Margolis, sea turtle project manager, and Dr. Burney inspect the new ATVs.

W.M. Tokishi is presented an appreciation award. From left, Steve Higgins; Dr. Richard Dodge; Mr. Tokishi; Dr. Ovid Lewis, Nova’s interim president; Marshall Lytle, of Nova’s Board of Trustees; and Leslie Brown, Nova’s vice president for development.
People on the Move

Dr. Julian McCready, Dean, attended the International Conference on Monsoon Variability and Prediction in Trieste, Italy, May 9-13. As part of the TOGA (Tropical Ocean-Global Atmosphere) Monsoon Experimentation Group, he presented a paper entitled "A Numerical Investigation of the Heat Budget in the Indian Ocean." The conference was sponsored by the World Climate Research Programme.

Dr. McCready was invited to the Lamont-Doherty Earth Observatory, a branch of Columbia University in Palisades, New York, to present a week-long series of lectures on "The ENSO Model and Mechanism." Extending from June 6 through 9, the seminar series was sponsored by the International Research Institute of Climate Prediction.

During August 2-11, Dr. McCready attended the NOAA-sponsored TOGA/COARE Data Workshop in Toulouse, France. The purpose of the workshop was to look at the initial data coming back from an intensive COARE (Coupled Ocean-Atmosphere Response Experiment) research operation in the western Pacific.

Dr. Richard Dodge and Dr. Mahmood Shivji attended a meeting of the American Society of Limnology and Oceanography (ASLO) in Miami, June 12-16. Dr. Dodge presented a paper, co-authored by Kevin Kohler, entitled "Calibration and Variability of X-Radiographs of Coral Skeletons Using Computer Image Processing Densitometry."

A graduate student of Dr. Shivji, Marta Smith, is spending the months of June through September at Queen's University in Belfast, Northern Ireland. She has been working with Dr. Michael Stanhope, a colleague of Dr. Shivji, using state-of-the-art molecular biological equipment for her research on molecular systematics of mammals. All of her research expenses were generously provided by Dr. Stanhope. (More on this project in the next issue of Currents.)

Dr. Charles Messing spent the month of July in Paris, working under a grant provided by the Museum National d'Histoire Naturelle. During his visit he began a taxonomic revision of the crinoid genus Comaster. To assist with the revision, he obtained specimens on loan from museums in Copenhagen, Stockholm, Amsterdam, and London, for comparison purposes. He also assisted his colleague, Dr. Nadia Cominardi, who is curator of echinoderms at the Museum, with the task of reorganizing the Museum's crinoid collection.

In June, Dr. Messing had returned to the Smithsonian Institution in Washington, DC, to look at crinoid specimens there as part of this generic revision. He also traveled from Paris to Leiden, The Netherlands, to examine natural history museum specimens that were too fragile to ship. Of his visit to the Paris museum, Dr. Messing said, "It was an extraordinary experience, walking through the same gardens that Cuvier walked through, and examining specimens that Lamarck handled almost 200 years ago."

Dr. Gary Kleppel will visit the University of North Carolina at Chapel Hill, located in Morehead City, September 1-2. There he will present an invited seminar entitled "Feeding Strategies, the Nutritional Environment and Zooplankton Production: Some Definitions."

Cruise News

Ph.D. student Carol Burkart participated in a research cruise in the Irish Sea off Ireland, June 8-27. She worked in particular on the biology of the region, with Dr. Richard Gowen and his colleagues from the Department of Agriculture for Northern Ireland in Belfast. Her job was to measure zooplankton feeding, egg production, and egg viability of copepods. Some of the data that she collected will be used in her Ph.D. thesis. Her major professor is Dr. Gary Kleppel.

Carol Burkart led the Nova Southeastern scientific party, which consisted of herself and M.S. students John Braker and Lee Houchins, on a research cruise aboard R/V Bellows in the Gulf of Mexico, August 9-12. Dr. Gabriel Vargo, from the University of South Florida, was chief scientist, and scientists from the University of Florida also participated. The team was particularly interested in the influence of benthic microalgae on the primary and secondary production off the west coast of Florida.

Center Seminar

On June 20, Dr. Gary Rand presented a seminar entitled "Ecological Risk Assessment of Pesticides with Emphasis on Aquatic Systems." Dr. Rand has served as a corporate environmental toxicologist for many years. Most recently, he has been Director of Toxikon Environmental Sciences in Jupiter, Florida. He is interested in developing an aquatic ecotoxicology program in the state, and will be teaching a course in Fundamentals of Aquatic Toxicology at the Center during the fall quarter.
Aquaculture Seminar Series Is Presented

A series of one-day aquaculture seminars is underway at the Center. The seminars are being conducted by Dr. Bart Baca and recent M.S. graduate Ken Cook.

According to Dr. Baca, “The U.S. imports more than 70% of its seafood. We are running out of natural supplies of seafood, and what you think is fresh is often weeks old. Aquaculture represents our best hope to insure that we have a source of fresh, high-quality seafood in the future. Aquaculture can be practiced on either a large, commercial scale using ponds, or on a smaller scale in tanks.” For our purposes, tanks are just fine.

A word of caution is offered by Cook, who said, “Sometimes people spend a lot of money on a hobby and others might be interested in aquaculture, but it’s still a new field and is considered to be a risky investment. By offering these seminars geared toward the ‘backyard aquaculturist,’ we hope to provide a way for people to learn about aquaculture hands-on, and then decide if they want to get in on it on a larger, commercial scale.”

The first seminar, on “Backyard Aquaculture,” was presented on July 15. Topics of discussion included tank and pond designs; available sources and quality of water; water discharge, filtering, and recirculation; marine and freshwater organisms; and permits required to set up a system. The August 5 seminar was entitled “Marine Shrimp Culture.”

Each seminar runs from 9:00 AM to 4:00 PM, usually culminating in a feast on the houseboat. The remaining schedule includes “Freshwater Prawn Culture” on September 9, and “Freshwater Fish Culture” on October 7. The cost of the last two seminars is $40 and $30, respectively, and lunch is provided. For information, call Helene Taylor or Dr. Baca at (305) 920-1909.

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Aquaculture Courses of Study

Aquaculture courses also are offered at the Center. The regular 12-week course, held every other year during the summer months, can be taken for credit or audit. The next long course will be offered in 1995.

Short courses in aquaculture are offered each spring; exact dates will be published in a later issue of Currents. Marine shrimp and freshwater aquaculture will be covered separately in the short courses in 1995.

Ongoing research activities at the aquaculture facility include tank culture and breeding of freshwater prawns and tilapia, breeding of marine shrimp, tank culture of exotic freshwater species from the Everglades, and tank holding of local marine fish and invertebrates. Graduate research projects are available in these areas. If interested, call Dr. Baca for details.

Student News

Joutje Koapaha, a Ph.D. candidate in Marine Biology from Indonesia, was chosen as one of approximately 90 minority students and professors who received financial support to attend the ASLO meeting in Miami, from June 12 to 16. Support was provided jointly by the National Science Foundation and Hampton University, through ASLO Minority Program Director Dr. Benjamin Cuker. The Minority Program started one day before the regular ASLO meeting got underway, and the funding covered six days’ stay at the Miami Hyatt Regency Hotel, food, transportation, workshops, and a field trip. Under the direction of his major professor, Dr. Curtis Burney, Koapaha presented a talk entitled “Nutrients Cycling in Coastal Mangrove Wetlands of South Florida.”

Koapaha also has received airfare and lodging support from the Jet Propulsion Laboratory (JPL) to attend their Summer School Program, from August 22 to 26. The program will be held at the California Institute of Technology in Pasadena, of which JPL is a part. It is sponsored jointly by NASA and NOAA. He is one of 250 students selected worldwide to attend. The program will cover a broad range of topics, including ocean-atmosphere interaction, climate change modeling, atmospheric physics, chemistry of the atmosphere, hydrologic and biochemical cycles, the role and response of ecosystems to global change, social implications of climate change, and global change research and government policy.

Melanie Denes Presents Thesis Defense

Melanie Denes, a M.S. student in Marine Biology, successfully defended her thesis on June 6. Her thesis was entitled “Gymnodinium breve as a Causative Agent in the Occurrence of Florida Red Tides.” Her thesis committee members were the Center’s Dr. Gary Kleppel (Chairman) and Dr. Pat Blackwelder, and Dr. Karl Schaum, of the Nova Southeastern University School.

According to the Abstract, “Blooms of the dinoflagellate Gymnodinium breve commonly occur in the Gulf of Mexico, especially along the southwest Florida coast. It is hypothesized that these blooms are the result of sudden population explosions due to increased mitotic division rates brought about by a combination of environmental conditions advantageous to the organism. Temperatures and salinities within the proper range and the availability of light and nutrients lend themselves favorably to initiation of the bloom. Hydrographic features such as winds, tides, currents and convergences act as concentrating and dispersal mechanisms.”

Denes’ paper examines the above factors and presents data from the literature documenting red tide events over the past 45 years. “It is apparent that red tides are often normal population increases that are confined or physically concentrated by various hydrographic features,” she concludes.

Following her defense, Denes returned to her chosen career. She will continue to teach in the Middle School of Nova Southeastern’s University School.
Dr. Richard Spieler's graduate students are used to it, but some of the rest of us are not. The fishy odor, that is. Locating an active research project to write about was not at all difficult this time around.

M.S. students James Sulikowski and Stacy Wolfe are engrossed in their thesis projects, both having to do with growth factors in local specimens. Their subject fish, however, happen to be quite different in their habits and configurations.

Sulikowski is working with the yellow stingray (*Urolophus jamaicensis*), trying to determine the age and growth of this fascinating creature by means of centrum (vertebra) staining. In this study, he removes a section of a vertebra from the backbone and sands it down to form a "bowtie" section, which he stains with alizarin red S.

"This stain incorporates itself into the centrum, where it basically makes the annual rings more evident" he explains. Yes, this stingray’s age can be estimated in much the same way as a tree’s or even a coral’s age can be determined: by counting the annual rings. In this case, however, there are two rings per annual band: an opaque zone and a translucent zone. "The opaque zone is a broader band, which apparently indicates growth in the summer. Translucent bands supposedly form during the winter-time. The opaque bands are much wider than the translucent bands, indicating more growth in the summer. I am now trying to estimate the age of the stingray by counting the two bands."

Sulikowski’s ray is very small and of a type that measures only 12 to 15 inches in length at maturity. The oldest stingray found in this size range was nine years old. The centrum ranges from only 2 to 5 mm in diameter, so he uses a compound microscope set on 25 magnification to do his counting.

Sulikowski plans to work with living rays to complete his project. "I will inject tetracycline, a fluorescent marker, in a living ray kept in captivity and in the field," he says. "Tetracycline gets in the vertebrae and marks the centra. It is deposited at sites of active calcification and remains distinct for some time. When an animal is dissected after one year, or a given amount of time, this tetracycline mark is a validation of the annual periodicity of the rings."

Stacy Wolfe is concentrating on a local ocean surgeon fish, *Acanthurus bahianus*. She has been collecting 20 of these fish a month since last October. Since she does not work with live fish, she gets her specimens by spearing them.

The specimens range in size from juveniles to adults. Adults grow to about 30 cm in length, or 1 foot. Wolfe’s procedure begins with weighing and measuring each specimen, then removing the two gonads. The surgeon fish has another organ located near the gonads, called the fat body. She removes the two fat bodies and weighs them also. The fish are then frozen.

In following this procedure every month for one year, Wolfe is intent on determining the fish’s annual reproductive cycle. "I found that at certain times of the year their fat bodies get very small, and the gonads get huge," she states. It has yet to be determined whether the surgeon fish is bimodal, reproducing twice a year, or unimodal, reproducing just once a year.

At this point in the study, Wolfe is in the process of returning to the earlier frozen collections and removing each fish’s otolith. This is a calcium carbonate structure, located in the inner ear, which gives the fish a sense of balance and sound detection ability. "The otolith is the most reliable indicator of age in most fish," Wolfe explains. "Every day a new layer of calcium carbonate is laid down in rings to form the otolith." Sound familiar? So far the oldest fish that she has measured by using this ring-counting method is 15 years old.

Both Sulikowski and Wolfe plan to have completed their research by the end of this year. Then all they have to do is write up their results, in the form of master’s theses.

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Karen Roberts Successfully Defends Thesis

On June 13, M.S. student Karen Roberts successfully defended her thesis in Marine Biology, entitled "The Distributions of Fish Populations in Natural and Mitigated Mangrove Forests in Southeast Florida." Her thesis committee consisted of Drs. Gary Kleppel (Chairman) and Richard Spieler of the Oceanographic Center, and John Goldasich, Director of the Broward County Office of Natural Resource Protection.

Roberts' study compared the fish communities in both mitigated (replanted) and natural mangrove areas in the Port Everglades estuary. Five years ago (see Currents, Summer 1989), a mitigation project that has been closely monitored by Center scientists got underway in John U. Lloyd State Park, on the ocean side of the Port. Roberts chose two of the mitigation areas as test sites, as well as two natural mangrove areas. She also selected two natural and two mitigated sites in nearby West Lake Park.

Some differences in the abundance of fishes were found between the natural mangrove sites of the two parks. According to Roberts' Abstract, they are due largely to hydrodynamic environmental factors, such as tidal flushing and discharge rates of waterflow, and seasonality. "However," the paper continues, "differences between the fish communities in the mitigated areas of both parks were not significant at the 0.05 level of probability. Small fishes, the forage base for the larger piscivores, were equally represented in the mitigated sites throughout the study, and always dominated their respective communities numerically. Differences between natural and mitigated mangrove areas occurred in the distributions of transient species. In general, these transient fishes occurred only in the natural sites; the larval stage of one transient species, however, was found only in the mitigated sites. Likewise, within a species, smaller fishes were generally found in the mitigated sites and larger fishes were found in the natural sites." She concludes by stating, "This study shows that mitigated mangrove forests are suitable habitats for small, forage species and presently there are differences in the fish populations in the natural and mitigated mangrove environments, the largest mangrove ecosystem remaining in Broward County."

Roberts has been invited to stay on at the Center as a Ph.D. candidate in Oceanography. She has agreed to do so, and will continue to study under the tutelage of Dr. Kleppel.

Ph.D. Degree Is Offered

The Ph.D. degree in Oceanography is offered at the Oceanographic Center. The degree program requires a minimum of 60 credits beyond the baccalaureate, 30 of which may be applied from the master's program. The remainder consists of at least 24 dissertation research credits and 6 credits from upper-level course work. Tuition is $8,400 per year.
Nova Southeastern President Steps Down

On July 1, Dr. Stephen Feldman stepped down as president of Nova Southeastern University. He stated that he was resigning because he wanted to enter the business world. He had two years remaining on a four-year contract with the University. Dr. Feldman is credited with raising money for new buildings and beautifying the Davie campus, and with sealing the recent merger with Southeastern University.

Dr. Ovid Lewis, who has served as vice president for academic and student affairs for the past 10 years, was named interim president by the Board of Trustees. The Board will meet again in September to determine whether to name Dr. Lewis president of the University or to begin a search for his replacement. "The emphasis during my tenure, whether as interim or permanent president, will be to ensure that the SACS (Southern Association of Colleges and Schools) reaccreditation process for the University - which will be completed in 1996 - goes smoothly," Dr. Lewis said.

Dr. Ovid Lewis, interim president.