Sea Turtle Nesting Shows Upward Trend

Dr. Curtis Burney, who serves as principal investigator for the ongoing sea turtle conservation project for Broward County, reports that the number of nests laid by loggerheads in 1993 (2,142), although down somewhat from the 1992 figure (2,221), supports a continuing upward trend. He notes that nesting was relatively constant during the 1980s, but beginning in 1990 the total number of nests jumped considerably.

The bar graph on page 2 shows the total number of nests for loggerheads, greens, and leatherbacks in Broward County since 1981. The two line graphs show nesting trends for loggerheads and for combined greens and leatherbacks over the same period. While an obvious upward trend is apparent for loggerheads, the nesting practices of green sea turtles created an up-and-down pattern over the years. Burney contends that “it is not clear whether the upward trend for loggerheads means that the number of turtles is increasing. Loggerheads will nest several times in one season, but probably won’t return for another one or two years or more. On the other hand,” he adds, “the bulk of the green sea turtle population may nest approximately every other year.” So if the female greens are in synch in their nesting habits, this peculiarity could explain the spikes on the graph, and the fact that only 23 nests were found in 1993 as opposed to 132 nests in 1992.

Leatherback nests were up to 16 last year, compared with only 7 nests in 1992. An upward trend in nesting is again apparent for the 1990s, following interesting peaks in 1985 and 1987 as shown in the bottom line of the chart.

Overall, Burney sums up the season by saying that “the trend is up, and that must be good. It could mean that conservation efforts over the years are starting to pay off.” In 1993, 119,281 loggerhead, 942 green, and 413 leatherback hatchlings were released into the ocean. “This is a high figure compared to other normal years. During those years, before relocation, turtles headed for the lights and got squished.” In 1992, an abnormal year, the number of hatchlings was radically affected by the arrival of Hurricane Andrew on August 24. Few nests, in fact, were able to withstand the force of the storm, and the eggs were lost. Last year was mercifully free of anomalous nesting statistics.

The project team once again gets high marks for its efforts. M.S. student Cathy Mattison served as project field manager for the first half of the season, and M.S. student Bill Margolis took over that post in July. They were ably assisted by a number of graduate students and volunteers.

(Continued on page 2)
Sea Turtle nesting Shows Upward Trend

(Continued from page 1)

New Faculty Publications


Dr. Gary Kleppel and his graduate students returned in January from a 34-day research cruise to the Weddell Sea in the Antarctic region (see story in Currents, Fall 1993). They brought with them some excellent tales and many riveting slides.

Apart from the fascination of the area, "the experience was scientifically exciting," said Kleppel. "Some of our results were unexpected, in that they didn't conform to the textbook version of the high-latitude food webs." It should be explained that the purpose of the study was to look at organisms at the middle trophic levels and their response to the spring/summer bloom at the ice edge. "Every year the phytoplankton, or algae bloom, go into a high reproductive phase, which starts the food web working," Kleppel explains. "So what happens is the algae are thought to be eaten by zooplankton, zooplankton by fish, and fish by penguins. Apparently some of the algae present were not being eaten by zooplankton, such as copepods, and as a result the whole way the food web works changes, right from the bottom up."

The students who accompanied Kleppel on the cruise played crucial roles in the research that was performed. Ph.D. student Carol Burkart tested her techniques and conducted some research toward her dissertation while on the cruise. "M.S. student Kevin Carter was among those who oversaw our many laboratory experiments," said Kleppel. "And it was fortunate that we had Karen Roberts along. Her interest is in gelatinous zooplankton (jelly fish). There were a lot of them around, and they may be very important to the food web." Karen currently is a M.S. student who soon will be accepted as a Ph.D. student in Kleppel's lab.

"One of the things very impressive in the Nova Southeastern component," Kleppel continues, "is that we were able to make many measurements in real time, using our HPLC system to analyze carotenoid pigments in the water column and in the diets of several copepod species." That capability, Kleppel feels, helps to characterize one very successful research experience.

On deck: Karen Roberts, Gary Kleppel, Kevin Carter, and Carol Burkart.

Carol Burkart at the microscope.

Penguins at play on the ice.
People on the Move

Dr. Richard Dodge was invited by the State Department to attend a meeting of consultants to the Bureau of Oceans and International Environmental and Scientific Affairs in Washington, D.C., on January 10. The purpose of the meeting was to consider activities that the administration might undertake as part of a new Coral Reef Initiative. Areas of focus of the Initiative are (1) a strengthened U.S. domestic management program, (2) a program of training and technical assistance directed towards the international community, and (3) a strategy to improve research and monitoring of coral reefs and related systems.

Dr. Dodge was joined in Washington on January 11 by Dr. Bart Baca, Center adjunct, Dr. Tony Knap, Director of the Bermuda Biological Station, and Dr. Tom Sleeter, Environmental Engineer for the Bermuda government, to visit the Marine Spill Response Corp. There they presented the results of their joint Panama oil spill study. Also present were representatives from the American Petroleum Industry and the National Oceanic and Atmospheric Administration (NOAA).

Dr. Richard Spieler attended the annual meeting of the World Aquaculture Society, which was held January 14-18 in New Orleans.

The annual Ocean Science Meeting, co-sponsored by the American Geophysical Union and the American Society of Limnology and Oceanography, was held February 21-25 in San Diego. Center faculty attending were Drs. Julian McCready, Jeff Proehl, and Peng Lu. Proehl presented a talk entitled "Stability of Equatorial Oceanic Flow"; Lu's talk was entitled "Subtropical-Equatorial Communication and Water Sources of the Equatorial Undercurrent: With Application to the Pacific Ocean."

On February 2, Dr. Julian McCready, Dean, presented a seminar at the Rosenstiel School of Marine and Atmospheric Science of the University of Miami. The talk was entitled "On the Coastal Circulation Generated by River Outflow."

Dr. McCready will travel to Trieste, Italy, May 9-13 to participate in the International Conference on Monsoon Variability and Prediction. He will present a paper entitled "A Numerical Investigation of the Heat Budget in the Indian Ocean."

Nova Merges with Southeastern University

Nova isn't just Nova anymore. On October 26, Nova president Dr. Stephen Feldman and the president of Southeastern University of the Health Sciences, Dr. Morton Terry, signed an agreement merging the two institutions. The merger received accreditation approval by the Southern Association of Colleges and Schools (SACS) on December 16, and as of January 1, we are now officially called Nova Southeastern University!

The merger adds colleges of osteopathic medicine, pharmacy, optometry, and allied health to Nova University. In June, 1996, the Health Professions Division, now located in North Miami, will relocate to a 250,000-square-foot facility that is to be constructed on the main campus in Davie. The combined school will consist of about 13,300 students and nearly 1,800 employees, and will have annual revenues of $135 million.

Dr. Feldman will remain president of the university, and Dr. Terry will become chancellor of the Health Professions Division. Dr. Feldman acknowledges that with a merger of this magnitude there will be some transitions to make in every department. But he feels that "the changes will be worth the effort as Nova takes another leap forward to provide Broward County with its first medical school. This is an exciting time to work here and be part of history in the making."

Dodge Given Editorship

Dr. Richard Dodge has been appointed Geology Editor of Coral Reefs, the journal of the International Society of Reef Studies. The journal is peer-reviewed and is published by Springer-Verlag in Berlin.
Holiday Party
Always a Success

The annual holiday party, held on December 17, was the usual unbridled success. The gala was organized by Kathy Maxson, with a big assist from M.S. student Melissa Dore. Guests whole-heartedly enjoyed the food table, which was loaded with two six-foot sandwiches (carve-it-yourself) and assorted chips, dips, salads, and a raft of homemade specialties. The dessert table was very special too, as was the punch.

Center Hosts Gold Circle Event

On January 20, the Oceanographic Center hosted a luncheon for about 25 members of Gold Circle, which is a prestigious support group that raises funds for Nova Southeastern (NSU) students. Anita Paoli Kotler served as program chair for Gold Circle, and NSU’s Marge Marino and Dr. Stephen Goldstein, vice-president for corporate and foundation relations, made local arrangements. Special guests included Dr. Charles and Lucy Forman, who have given so much to our laboratory over the past 25 years.

After lunch Gold Circle President Judy Tillman made opening remarks, followed by Associate Director Dr. Richard Dodge, who showed a videotape describing ongoing research activities at the Oceanographic Center. Then faculty member Dr. Gary Kleppel gave a slide presentation showing some of the activities that took place during his recent research cruise to Antarctica. He also discussed with the group current progress in the area of women in science. Ph.D. student Carol Burkart, who also participated in the cruise, assisted with the slide presentation.
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 $300 per credit hour (50 percent less for audit). Classes meet once a week from 6:30 to 9:30 PM at the Oceanographic Center. The spring term runs from April 4 to June 24, 1994. For further information, call Helene at (305) 920-1909.


Coral Reef Ecology (CZMT-0605): Covers general ecology of corals and coral reefs. Includes discussion and description of distribution, abundance, and physiology of corals and coral reef animals. Describes causes and effects of important natural and anthropogenic events. Emphasizes coral reefs of the Caribbean and Florida Keys. A one-day field trip to the Keys (snorkeling only) is required. Instructor: Dr. Joshua Feingold (Center adjunct.). Starts Tuesday, April 5.

Marine Phytoplankton (OCMB-6060): Provides a study of the major groups of phototrophic marine eukaryotic plankton, stressing current concepts of their activities, ecological role, importance, dynamics, and interrela-

Wetlands Ecology (CZMT-0791): Covers basic ecology of coastal wetlands, followed by intensive field work in the identification, delineation, and evaluation of the functions of these wetlands. Includes identification of wetland indicator species. Field trips to area wetlands provide knowledge of agency delineation techniques based on vegetation, soils, and hydrology. Instructor: Dr. Bart Baca (Center adjunct). Starts Thursday, April 7.

SUMMER TERM SCHEDULE

The summer term extends from July 5 to September 16, 1994. Course descriptions will be printed in the next issue of Currents.

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

Marine Ichthyology (OCMB-6230). Instructor: Dr. Richard Spieler (Center faculty).

Marine Botany (OCMB-6070). Instructors: Dr. Bart Baca (Center adjunct) and Dr. Mahmood Shivji (Center faculty).

(CZMT-----). To be announced.

Ph.D. Degree Offered

The Ph.D. degree in Oceanography also is offered at the 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 at least 6 credits from upper-level course work, which usually is taught in the tutorial mode. Students are expected to complete the program within 5 years, a minimum of 1½ years of which must be in residence.

Undergraduate News

Oceanography students in the Joint Science Program have enjoyed some recent adventures as members of the Nature Club. On November 19 and 20, under the leadership of Dr. Richard Spieler, nine students traveled to the Looe Key Dive Resort, located about 25 miles north of Key West. There they participated in two dives (SCUBA or snorkeling) off a 65-foot catamaran. The dives took place in a marine preserve just outside of Pennekamp Coral Reef State Park.

About 16 members of the Nature Club again traveled with Dr. Spieler to Sea World in Orlando, April 5-6. There they attended a symposium on Sharks and Coral Reefs, where the headline speaker was famous oceanographer and shark expert Dr. Eugenie Clark.

Reported by Robin Sherman
**Kevin McAllister Presents Nonthesis Option Paper**

Kevin McAllister, a M.S. candidate with a specialty in Coastal Zone Management, presented his nonthesis option paper in January. Its title is “A Comprehensive Approach to Dune Restoration in South Florida: Key Elements in the Coral Cove Project, Palm Beach County, Florida.”

McAllister works as an Environmental Analyst for the Coastal and Wetlands Division of the Department of Environmental Resources Management of Palm Beach County. He writes that the Department implemented a Shoreline Protection Program in 1988, with a goal “to provide publicly accessible beaches, maintain the tourist-based economy, and protect upland property in a manner that protects the natural environment to the greatest extent possible.” To fulfill this goal, dune restoration projects have been planned in areas where this type of shoreline protection is warranted. The Coral Cove Project, encompassing over one mile of shoreline, is one such study.

The project area is located on a barrier island, called Jupiter Island, in the extreme northern portion of Palm Beach County. The shoreline and submerged bottom in this area exhibit one of the most distinct natural outcrops in Florida. These outcrops offer a wide variety of habitats to a multitude of marine organisms. Thus the region is very important to the marine ecosystem.

Unfortunately, as in many coastal regions throughout the world, the area of interest has been the victim of shoreline erosion. According to McAllister, “Although there is considerable debate, the general consensus among the scientific community is that the increase in coastal erosion is the result of a subtle rise in sea level due to the melting of the polar ice caps.” There are others who suggest that most of the sea level rise observed this century is due to thermal expansion of the ocean. Regardless of the cause, few dispute that sea level has been rising. The effects on the coastal environment have been severe.

McAllister’s study looks at the beach/dune system, its changing faces, and the factors upon which it is dependent: waves, sea level rise, beach sand supply, and the shape of the beach. “The relationship among these factors is a natural balance referred to as a dynamic equilibrium,” he explains. “When one or more of these factors experience change, the others adjust accordingly to maintain the equilibrium.”

As a proponent of dune restoration as a means to deal with shoreline change, McAllister states that “If designed properly and constructed correctly, a restored dune system will function as a natural dune in storm events, serving as a sand reservoir while dissipating wave energy. This allows the system to function naturally, thereby maintaining the dynamic equilibrium.”

**Alumni Notes**

Coastal Studies graduate Peter Roopnarine reports that he completed work toward the Ph.D. degree at the University of California at Davis this March. His field of study was Marine Paleontology and Evolutionary Biology, and his thesis was entitled “Systematics, Biogeography and Extinction of Chionine Bivalves in the Late Neogene of Tropical America.” Currently he is working under Dr. Sandra Carlson in the Geology Department as a postdoctoral fellow.

Roopnarine’s wife of one year, Kim Driver, also a Coastal Studies graduate, is just a year away from her Ph.D. degree in Ecology at U.C. Davis. She is studying the hydrodynamics of hammerhead sharks.

Jerome Lynn Hall, Coastal Studies graduate, reports to us from Houston by way of an introductory newsletter. It is entitled The Broadside and soon will become the quarterly publication of the Pan-American Institute of Maritime Archaeology (PIMA), of which Hall is president. In 1990 Hall and a small group of researchers formed PIMA. Their first task was to undertake the excavation of a 17th century shipwreck off the coast of the Dominican Republic. “Three years later,” writes Hall, “we are still actively working the site of the Monte Cristi shipwreck. We anticipate an additional four summers of work (through 1997) to complete the excavation phase of the project. Conservation will take many more years, and the final publication is tentatively scheduled for the year 2000.”
Sea Lily Experiment Underway

Dr. Charles Messing's research on sea lilies has taken another turn. He has been keeping specimens alive in a large seawater tank at the University of Miami's RSMAS (Rosenstiel School of Marine and Atmospheric Science) Experimental Fish Hatchery, which is directed by Thomas Capo. The specimens were collected in 420 m off Grand Bahama Island in August and November, 1993, using the Johnson Sea Link submersible. The sea lily tank is in the hatchery’s facility for raising sea hares (Aplysia); these animals, coincidentally, must be maintained at the same low temperatures that the sea lilies prefer (12-15°C). The facility can pump the large amounts of cool water that the sea lilies need.

Dr. Messing has been carrying out experiments with colleague Dr. Tomasz Baumiller, of Harvard University, and University of Miami undergraduate Scott Bickel on the means by which the sea lilies raise their feathery crowns off the bottom in order to feed. The problem is that the sea lilies’ stalks have no muscles—only ligaments—so it is not clear how they manage to erect themselves. Because sea lilies, which grew in vast meadows on many shallow ocean bottoms millions of years ago, are important fossils, the answer will be of interest to paleontologists.