Five President’s Faculty Research and Development Grants (PFRDG) Awarded to Oceanographic Center Professors!

To meet the needs of its many constituencies, the university has developed a mission statement that addresses the contemporary needs of students, faculty and staff members, and the community members throughout South Florida, other areas in Florida, and other states and international locations served through distance education.

As one of many means used to address the university’s mission statement, and specifically the issue on how the university “fosters inquiry, research, and creative professional activity,” Ray Ferrero, Jr., university president, initiated the President’s Faculty Scholarship Award Program in 1999 (now the President’s Faculty Research and Development Grant). The grants are designed to bring recognition and funding to the university’s full-time faculty members as they attempt to secure resources in support of research activities. The program is proactive in terms of providing impetus and direction toward research activities, and in turn, it receives a considerable level of attention by the university’s administration as a means of faculty support.

Since the start of the grants, the Nova Southeastern University Board of Trustees has voted to allocate $2,000,000 to create the President’s Faculty Research and Development Grant. Of the money used to fund the awards, 50 percent comes from the interest generated from this account, and the other 50 percent comes from the winning faculty members’ academic units.

Each spring, full-time faculty members across the university compete for the grants that can reach a maximum amount of $10,000. In the six-year history of these awards, 285 faculty members have shared $994,482 in financial support for research and scholarship at NSU. Grant winners have come from all of the university’s 16 academic units.

The findings generated from these studies not only contribute to society’s knowledge on the specific subjects, but the research also will be used to inspire and inform the NSU students who attend classes given by these faculty members. This year, 5 of the 17 awards went to Oceanographic Center professors, amounting to a total of $41,250!

Richard Spieler, was awarded $10,000 for his research titled, “Assessment of the Fish and Corals of Veracruz, Mexico: A Comparative Study” (with David Gilliam, Ph.D.).

The Parque Nacional Sistema Arrecifal Veracruzana (Veracruz Coral Reef System National Park) consists of 17 different reef components surrounding the port of Veracruz, Mexico, and encompasses a total of 52,000 hectares. The purpose of this project is to make an initial assessment of fish and coral assemblages within the park and compare these results to assemblages known from reefs in Broward County, Florida. Spieler

(Continued on page 2)
and Gilliam will test hypotheses that there are no differences among the fish and coral assemblages of reefs within the park. Data collection will be accomplished using nondestructive visual surveys of widely separated reefs within the park and comparing those results with data archived at NSU. Rigorous analysis of data will be accomplished using parametric and nonparametric methods. Results of this study will provide the park with a list of fish and corals and the distribution of this biota within the park. This information is critical for establishing and evaluating resource management strategies as well as evaluating the extent of anthropogenic, and other, impacts. Comparison between the Veracruz reefs and those of Broward County will provide insight into the distribution of Atlantic coral reef fish and corals and the potential connectivity of these two widely separated reef systems. This information is important for understanding the impact that changes on Veracruz reefs would have on reefs of the Southeast United States. A host of additional research spin-offs are anticipated that will be funded out-of-house, including more in-depth biotic assessment, artificial reef evaluation, and genetic studies.

Charles Messing, Ph.D., received $8,250 for his deep-sea research titled, “Quantitative Analysis of Deep-sea Coral Habitat Structure: East Coast of Florida” (with Joshua S. Feingold, Ph.D.).

Coral reefs abound in shallow tropical waters around the world’s oceans, and their deterioration over recent decades due to a wide range of environmental insults has been well documented. However, coral reefs also exist in the deep sea to depths of over a mile. They are far more widespread than shallow-water reefs, support a great, but largely unexplored, diversity of associated organisms, and also are threatened by environmental degradation. Such deep-sea coral reefs occur along much of the Florida continental margin, where recent preliminary investigations have revealed that they support potentially important commercial fish populations as well as organisms (e.g., sponges and soft corals) being examined as possible sources of novel biopharmaceutical compounds. In November 2005, a NOAA-sponsored expedition (in which Messing participated) made 14 submersible dives to 11 of these reefs and returned far more data than anticipated. In particular, the extensive video transects of different deep reef habitats remain unanalyzed. Because understanding patterns of organism distributions is critical to developing plans for the conservation and protection of these habitats, Messing proposes to quantitatively analyze this video dataset to document the distribution and abundances of deep-reef organisms relative to environmental characteristics including substrate, topography, temperature, and depth. Analytical methods will follow protocols used successfully to study similar habitats. Messing expects to produce at least one peer-reviewed scientific journal article, one conference presentation, and one conference poster. Results will be incorporated into proposals planned for agency submission. The collaborative component consists of training undergraduate students (FCAS) to carry out analyses under faculty supervision, with input from external deep-sea coral specialists.

Patricia Blackwelder’s award was $10,000 for her research titled, “Ultrastructural Analysis in the Elucidation of Disease in Reef-Building Corals” (with Alison Moulding, Ph.D.).

A significant increase in the incidence of coral disease has been observed worldwide over the last decade and may play a significant role in the demise of critical reef-building species. Dark Spot Syndrome (DSS) typically affects the reef-building coral *Siderastrea siderea* and manifests as black, brown, or purple lesions of varying size, shape, and location. These lesions can result in tissue death and can cause underlying skeletal changes. To date, the cause of DSS remains unknown. Thus, investigation is needed at a level of resolution not possible with light microscopy. Transmission (TEM) and scanning (SEM) electron microscopy allows...
detection of ultrastructural tissue and skeletal changes, including variability in organelle morphology, membrane integrity, and micron-scale crystalline structure of the coral skeleton. In addition to intracellular effects, ultrastructural analysis may reveal microbial activity and initial tissue effects not resolvable by histology. For example, these effects were recently reported on previously unrecognized bacterial populations within the epidermal tissue of the reef-building coral, *Montastraea cavernosa* (Blackwelder et al. 2006; Renegar et al., in prep). The primary objective of this study is the investigation of the cellular characteristics, possible pathogenic microbes, and skeletal variability of diseased and healthy *S. siderea* using TEM and SEM. This work will be collaborative with researchers at the University of Mississippi currently investigating DSS. An additional objective is identification and isolation of epidermal bacteria observed undergoing active phagocytosis by amoebocyte cells in *M. cavernosa* using current methods of genetic analysis in collaboration with Kim Ritchie, Ph.D., at Mote Marine Laboratory. Four NSU Oceanographic Center graduate students will participate at the author level in all aspects of this study. This study will contribute to the need for detailed knowledge of coral disease etiology and advances the goal of effective protection of current coral reef condition. 

Mahmood Shivji, Ph.D., well known for his shark research, received $10,000 for his research titled, “Determining Global Population Genetic Structure in Highly Threatened Sharks” (with Michael Stanhope, Ph.D.). Shark populations worldwide are declining rapidly from overfishing to supply the international fin trade. These declines have raised serious concerns about potential species and population extinctions and impacts of this large-scale apex predator removal on the health of marine ecosystems. The primary reason for overexploitation of sharks is the absence of effective fishery management for these species by most countries. To address this issue on an international level, the U.N. Food and Agriculture Organization has asked fishing nations to urgently implement management plans for shark conservation. These plans are to emphasize monitoring of shark catches and trade on a species- and population-specific basis to allow early detection of overfishing that might otherwise lead to population crashes and extinctions. However, a major obstacle to implementing such monitoring programs is the almost complete lack of information on population genetic structure for most shark species. Shivji, therefore, proposes to develop and use two classes of variable molecular markers (nuclear microsatellites and mitochondrial DNA sequences) to assess the detailed, global-scale population genetic structure of two extremely threatened, CITES Appendix II-listed shark species—the basking shark and the great white shark—whose fins are highly valued in the market. The molecular marker data will be analyzed using evolutionary (phylogenetic and network) and new Bayesian statistical methods to provide robust estimates of population structure. This study will facilitate, for the first time, the ability to track the population origin of market products from these charismatic and highly threatened species. Furthermore, this research will provide the first assessment of population genetic structure for any globally distributed shark and serve as a model for future similar studies on other migratory sharks. The threatened status of our study species and previous media interest in our shark research suggest that this study also may generate additional publicity for NSU research.

Veljko Dragojlovic received $3,000 for his “Investigation of Structure and Origin of Kerogen by Ruthonium Tetroxide Oxidation.” Kerogen is an insoluble organic material from sedimentary rocks. It is by far the most abundant organic sedimentary material, comprising an estimated 90 percent of it. It has been estimated that coal makes up 9 percent and oil only 1 percent of the sedimentary organic material. Knowledge of structure of kerogen is important both for practical reasons (conversion into oil and value-added chemicals) and for more fundamental reasons such as establishing its origin. Kerogen fragments obtained as a result of oxidation will be isolated and identified by means of gas chromatography and mass spectrometry. Finally, from the fragments, Dragojlovic will attempt to reconstruct the original structure of kerogen and establish its origin. ➔
Other Awards

NSU’s Office of Student Affairs recently hosted the Fifth Annual Student Life Achievement Awards (the Stueys) celebrating the university’s best in leadership, scholarship, service, integrity, commitment, involvement, and responsibility. On April 19, Mahmood Shivji, Ph.D., NSUOC professor, won the award for professor of the year. Shivji was on research travel and could not attend. Richard Dodge, Ph.D., OC dean, accepted for him.

Edward O. Keith, Ph.D., and Lemuel Aragones, Ph.D., his collaborator at the University of Miami, were notified on May 24 that they were receiving a $10,000 grant from the Sea World/Busch Gardens Conservation Fund to support their ongoing study of the ecology and conservation of cetaceans in Tañon Strait, Philippines. They have been studying the biology and conservation of cetaceans in this area since 2003 and received an NSU President’s Faculty Research and Development Grant in 2004 to support the work. Last year, the Sea World/Busch Gardens fund provided $3,500 for this project. The main goal of the project is to develop a special area management plan for the southern Tañon Strait.

People on the Move

Recently, the 13th Ocean Sciences Meeting—a joint meeting of the American Society of Limnology and Oceanography (ASLO), Estuarine Research Federation (ERF), The Oceanography Society (TOS), and American Geophysical Union (AGU)—was held February 20–24 at the Hawaii Convention Center located in Honolulu, Hawaii.

Meeting attendees and representatives from the NSUOC and the National Coral Reef Institute (NCRI) traveled across the country from the shallow waters of South Florida to the deep Pacific waters of the country. From the shallow waters of the Dry Tortugas to the deep Pacific waters of the country, NSUOC alumni and NSUOC research assistant Jennifer M. Smith, Ph.D. (all of NSUOC/NCRI), displayed “Comparison of Mangrove Carbon?”, co-authored by Bernhard Riegl, Ph.D., Samuel Purkis, Ph.D., and Richard Dodge, Ph.D. (all of NSUOC/NCRI).

Poster presentations also were given.

- Alex V. Soloviev, Ph.D., associate professor, presented “Analysis of the Near-Surface Turbulence and Bubble-Cloud Measurements,” co-authored by R. Lukas, Ph.D. (University of Hawaii at Manoa).
- James D. Thomas, Ph.D., professor and NCRI research scientist, presented “Marine Hotspots Revisited.”
- Associate Professor Alex V. Soloviev, Ph.D., displayed “Response of the Coastal Ocean on the Southeast Florida Shelf to Tropical Cyclones During 1999–2005 Hurricane Seasons,” co-authored by Richard E. Dodge, Ph.D.(NSUOC); T. Gustafson (NSUOC); M.E. Luther, Ph.D. (University of South Florida); and R.H. Weisberg, Ph.D. (University of South Florida).
- Alumna and NCRI research assistant D. Abigail Renegar displayed her poster, “Effects of Sedimentation Stress on Ultrastructure and Calcification in Montastraea cavernosa,” co-authored by Patricia L. Blackwelder, Ph.D.; Bernardo Vargas-Ángel, Ph.D.; Bernhard M. Riegl, Ph.D.; Aaron W. Miller (M.S. student); David A. Portnoy (M.S. student); Richard E. Dodge, Ph.D.; and David S. Gilliam, Ph.D. (all from NSUOC).
- M.S. student and NCRI research assistant Erin C. Hode displayed “Comparison of Sedimentation and Phosphate Stress in the Staghorn Coral, Acropora cervicornis,” co-authored by Bernardo Vargas-Ángel, Ph.D.
- John C. Brock (USGS) showed “Geomorphologic Structure of Shallow Benthic Habitat Topographic Complexity in the Dry Tortugas,” co-authored by NCRI research assistant Kristi Foster; C. Wright, Ph.D. (NASA); and A. Nayegandhi, Ph.D. (USGS).

Reunion with NSUOC alumni Aaron Hartz (class of 2004 and now Ph.D. candidate at Oregon State University) and Ryan Moyer (class of 2005 and now Ph.D. candidate at The Ohio State University) at the Coral Holobiont, Coral Health and Disease, and Environmental Change III Poster Session, gathered in front of Hodel’s poster (top row, L to R): Alex Soloviev, Ph.D.; D. Abigail Renegar; Aaron Hartz; Erin C. Hodel; Kristi and Greg Foster; Ryan Moyer; (Bottom row, L to R) Kevin P. Helmele and Christina L. Gwaltney. Not shown: James D. Thomas, Ph.D.
Edward O. Keith, Ph.D., had a very busy spring schedule. He was in Veracruz, Mexico, from March 4 to 12, working on a variety of ongoing research projects. The Antillean manatee is endangered throughout its range in Mexico, which extends from northern Veracruz State along the coast of the Gulf of Mexico, extending to the eastern coast of the Yucatan peninsula and the Mexico-Belize border. Because of this, for the past six years Keith; Enrique Portilla, Ph.D.; and students from the University of Veracruz have been conducting population studies of manatees in the Alvarado Lagoon System near Veracruz for the purpose of developing educational and conservation programs designed to increase awareness of manatees by the residents of the Alvarado Lagoon System (ALS) and to reduce poaching, the primary cause of manatee mortality in this region.

On March 14, Keith attended the 57th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy in Orlando, Florida, where he presented a poster, entitled “Adhesion of Tear Proteins to Contact Lenses,” describing his work in collaboration with Andrea Janoff, O.D., of the NSU College of Optometry.

Continuing in his busy schedule, on April 12, Keith presented a lecture on pinniped behavior to a seminar class in marine mammal behavior (BSC 6936) taught at Florida Atlantic University in Boca Raton, Florida, by Denise Herzing, Ph.D. Herzing is the founder and director of the Wild Dolphin Project (WDP), which is engaged in a long-term scientific study of a specific pod of Atlantic spotted dolphins that lives 40 miles off the coast of the Bahamas in the Atlantic Ocean. WDP has accumulated unprecedented amounts of baseline data about these dolphins, their relationships with other dolphins, and their daily lives in the ocean.

On May 4–13, NSUOC research assistants Pat Quinn (Ph.D. candidate) and Kirk Kilfoyle (M.S. candidate) traveled to Koror, Palau, for the Coral Reef Restoration and Remediation Working Group (RRWG), one of an international multigroup project funded by the World Bank Global Environmental Facility. While in Palau, Quinn and Kilfoyle met with Rommi Dizon, Ph.D., from the University of the Philippines, and local contractor Mason Whipps, of Surangel and Sons, to review requirements for, and begin construction on, artificial reef modules. The RRWG project is designed to cascade knowledge to developing countries to help protect coral reefs and related reef resources. In addition to Palau, there are complementary projects in the Philippines, Tanzania, Australia, and Mexico. Other working groups include Bleaching and Local Ecological Response; Disease, Connectivity, and Large-Scale Ecological Processes; Restoration and Remediation; Remote Sensing; and Modeling and Decision-Support Tools.

Additionally, Quinn and Kilfoyle did some preliminary logistical background work to examine the feasibility of future research projects in Palau. They met with Pat Colin, Ph.D., of the Coral Reef Research Foundation, and Kenneth Coonrod, of the Palau Conservation Society, and visited the Palau International Coral Reef Center. Dermot Keane, founder of the Palau Shark Sanctuary Fund, provided valuable contact information while Ron Leidich, local guide and coral reef conservation activist, shared his knowledge of local fish populations,
nursery habitats, and potential future study sites. Visits to fish markets also provided insight into local fishing practices and impacts on commercially targeted species. An unexpected challenge that arose for the NSUOC pair was that there are no street addresses or even street names in Palau, which, at times, left the two confused as to their destination’s location. A local Palauan explained that people give directions by using landmarks.

Quinn and Kilfoyle were able to enjoy some of the spectacular diving available in Palau. They went to Blue Corner, which is known for its large population of sharks and schools of jacks that number in the hundreds, and Jellyfish Lake, which is filled with millions of “stingless” freshwater jellyfish.

One interesting evening found Quinn, Kilfoyle, and Dizon experiencing a local food specialty, fruit bat soup. They were quite surprised to discover the soup is served with the whole fruit bat (wings, head, fur, and all) floating in the bowl. But they ate it, and all agreed, it tasted like chicken.

Richard E. Dodge, Ph.D., and Thomas Gustafson, J.D. (director of government relations and former speaker of the House of Representatives), attended the most recent Florida Oceans and Coastal Resources Council (FOCRC) meeting in Tallahassee, scheduled to bridge over each side of the annual Florida Oceans Day observance in the Capitol Building. The NSU banner was hung and displayed from the third floor rail in the Rotunda. Carol Fretwell, National Coral Reef Institute’s (NCRI’s) coordinator of administrative operations, manned a four-focused booth promoting NCRI, the OC, the 2008
International Coral Reef Symposium in Fort Lauderdale, and a statewide cooperative initiative to establish a Florida Coastal Ocean Observing System (COOS). Dodge and Gustafson have been instrumental in spearheading the Florida COOS caucus effort involving more than a dozen Florida universities and marine laboratories. Their visit to the council meeting was in support of FOCRC’s program and budget.

From March 24 to 26, Edward Keith, Ph.D., served as the organizer of the 14th Southeast and Mid-Atlantic Marine Mammal Symposium (SEAMAMMS), held at the NSU Health Professions Division. SEAMAMMS, formerly known as the Atlantic Coastal Dolphin Conference, is a forum for biologists conducting research on all species of marine mammals in waters from New Jersey to Texas. The purpose of the conference was to bring together scientists and undergraduate and graduate students to present their latest research results in a regional meeting format to their colleagues. Awards were given for the best student oral and poster presentations. The plenary speaker was Denise Herzing, Ph.D., founder and director of the Wild Dolphin Project in Jupiter, Florida.

Workers for the Broward County/NSU sea turtle conservation program attended the annual Florida Marine Turtle Permit Holder’s Meeting held February 3–4 at the Sea Turtle Inn in Jacksonville, Florida. In attendance were program manager, Stephanie Ouellette, along with Mary Wozny, Michele Blackburn, Laura Wright, Stephanie Rogers, Jessica Watters, Karen Schanzle, Megan Seese, and Samara Parker.

Ouellette and Wozny also attended the 26th Annual Symposium on Sea Turtle Conservation and Biology held April 2–8 on the Island of Crete, Greece. Ouellette presented a poster entitled, “The Influence of High Temperature and Two Hurricanes on the Success of Late Season Loggerhead Nests in Broward County, Florida in 2005,” co-authored by Curtis Burney, Ph.D., NSUOC associate professor.

M.S. student Erin Hodel attended the Society for Sedimentary Geology (SEPM) workshop, “Quaternary Reefs and Platforms: Bridging the Gap Between the Ancient and the Modern,” which was held at the George R. Brown Convention Center in Houston, Texas, April 13–14.

Veljko Dragojlovic, Ph.D., and his students (David Kiviat [Pine Crest High School, Fort Lauderdale], Wen Chi Chow [former student of Farquhar College of Arts and Sciences Math, Science, and Technology Division, currently a student at HPD Dental School], and Walt Justice [M.S. graduate student]) attended the 231st American Chemical Society National Meeting and Exposition in Atlanta, Georgia, on March 27. They presented a poster titled, “Catalytic Ruthenium Tetroxide Oxidation of Haloalkanes.”
GHRI News

In a recent paper published in the scientific journal *Conservation Genetics*, a team, led by Mahmood Shivji, Ph.D., director of the Guy Harvey Research Institute (GHRI) at NSU’s Oceanographic Center, has reported the presence of a new, as-yet-unnamed species of hammerhead shark that occurs off the southeastern United States. This new species is so similar in appearance to the large scalloped hammerhead that its existence was only detected after examining its DNA. This major and unexpected discovery has significant implications for the management and conservation of hammerhead sharks, which are being rapidly overfished to supply the lucrative international shark fin market.

See the complete reference to the paper below. An accompanying news article published in the *Miami Herald* can be found at [www.miami.com/mld/miamiherald/sports/14241536.htm](http://www.miami.com/mld/miamiherald/sports/14241536.htm).

The Guy Harvey Research Institute (GRHI) at the Oceanographic Center was the recipient of a $5,000 donation from the Miami Billfish Tournament for its research into conservation of billfish.

The Miami Billfish Tournament (MBT) is a catch-and-release fishing competition held once a year. The organization donates a portion of their proceeds to marine conservation organizations. For the past four years, Guy Harvey, Ph.D., has done original artwork for their tournament magazine cover, and they donate funds for GHRI’s conservation research. The funds will be used to expand the research using forensic technologies to identify pelagic fish body parts in trade. The research, currently being used on sharks, will be expanded to including billfish species, specifically blue and white marlin, for both management purposes and to investigate their early life history and ecology for conservation purposes.

Recent GHRI Scientific Publications


Pharmaceuticals. Lead compounds for developments of new possible pharmaceuticals themselves or as biologically active are of interest either as benefits to humans. Molecules that are chemical ecology frequently provides direct even exploit, signal chemicals? Study of have predators developed to deal with, or interact with receptors? What mechanisms is their evolutionary origin? How do they and biosynthesis of signal molecules? What biochemical questions. What is the origin help us answer important biological and Knowledge of chemical ecology may they carry, and their mechanism of action. Chemical communication by means of signal chemicals. They employ signal chemicals to communicate with members of the same species, to attract symbionts, to defend against pathogens, to repel predators, to obtain information about prey, and to attract prey. Chemical ecology is a study of the structure of signal chemicals, information they carry, and their mechanism of action. Knowledge of chemical ecology may help us answer important biological and biochemical questions. What is the origin and biosynthesis of signal molecules? What is their evolutionary origin? How do they interact with receptors? What mechanisms have predators developed to deal with, or even exploit, signal chemicals? Study of chemical ecology frequently provides direct benefits to humans. Molecules that are biologically active are of interest either as possible pharmaceuticals themselves or as lead compounds for developments of new pharmaceuticals.

M.S. Degree specialties are marine biology, coastal zone management, marine environmental science, and physical oceanography. Each course carries three credit hours or may be audited. Tuition is $639 per credit hour (50 percent less for audit). Classes meet once a week from 6:30 to 9:30 p.m. at the Oceanographic Center (unless otherwise specified.) The summer term courses run from June 26 to September 15 (unless otherwise specified). Registration ($25 nonrefundable fee) begins on June 5. For further information, call Richard Spieler or Melissa Dore at (954) 262-3610 or 800-396-2326, or email imcs@nsu.nova.edu. More information can be found at the center Web site at www.nova.edu/ocean.

Lab Fee: $15. Instructor: Curtis Burney, Ph.D.

In-House Electives

TOPICS IN CHEMICAL ECOLOGY (Begins July 11)
Course #: OCMB-6210/CZMT-0660/MEVS-5040
A large number of animals engage in chemical communication by means of signal chemicals. They employ signal chemicals to communicate with members of the same species, to attract symbionts, to defend against pathogens, to repel predators, to obtain information about prey, and to attract prey. Chemical ecology is a study of the structure of signal chemicals, information they carry, and their mechanism of action. Knowledge of chemical ecology may help us answer important biological and biochemical questions. What is the origin and biosynthesis of signal molecules? What is their evolutionary origin? How do they interact with receptors? What mechanisms have predators developed to deal with, or even exploit, signal chemicals? Study of chemical ecology frequently provides direct benefits to humans. Molecules that are biologically active are of interest either as possible pharmaceuticals themselves or as lead compounds for developments of new pharmaceuticals.


CORAL REEF BIOLOGY AND ECOLOGY (Begins July 5)
Course #: OCMB-7012/MEVS-5007
The purpose of this class is to introduce students to the general biology and ecology of corals and coral-associated organisms. Topics will include a historical perspective of coral study, coral distribution, diversity and abundance, coral taxonomy, reef types and morphology, zooxanthellae symbioses, reproductive ecology including recruitment and dispersion of larvae and propagules, coral reef trophic systems, natural and anthropogenic perturbations, coral adaptation and evolution, corals as a source of proxy records, rapid reef assessment techniques, and coral reef resource management. Active classroom discussion will be encouraged during and following the presentation of material by the professor. A formal discussion period on selected papers will be conducted during each class. Material will be presented from a global perspective, with focus on the South Florida and Caribbean marine environment. Two weekend field trips are planned to allow the student to directly experience the local coral reef and coral community habitats.
Lab Fee: $50. Instructor: Joshua Feingold, Ph.D.

Weekend Field Course

TROPICAL MARINE FISH ECOLOGY
Course #: OCMB-6120/CZMT-0690/MEVS-5000
COURSE DATES: 7/26, 8/1, and 8/3, 6:30–9:30 p.m. Weekend (7/29–30 and 8/5–6)

This course will cover the ecology of tropical fish, including coastal, estuarine, mangrove, and pelagic fish. Emphasis is on identification and natural history of local species. Current theories on distribution and abundance will be discussed in addition to ecological theory. Coursework will take place in three evening meetings at the OC. Fieldwork will take place over two weekends at the Keys Marine Laboratory, Long Key, Florida. On return to the Oceanographic Center, self-directed and self-scheduled laboratory study will be required.
Lab Fee: $375. Limited to 20 students. Instructor: Paul Arena, Ph.D.

Other Publications

Ph.D. Degree Offered

The Oceanographic Center offers a doctoral degree in oceanography/marine biology. The program requires a minimum of 90 credits beyond the baccalaureate. At least 48 credits must consist of dissertation research, and at least 42 credits must consist of upper-level coursework. Required courses include the four M.S. core courses. Other upper-level coursework is usually in the tutorial mode with the major professor. Tuition is $4,365 per quarter.

Seminars and Defenses

Thesis

Aaron Miller, “Stress response in Montastraea cavernosa as a result of sediment loading: Quantitative histological and ultrastructural analysis.” Committee: Patricia Blackwelder, Ph.D.; Bernhard Riegl, Ph.D.; and Alison Moulding, Ph.D. April 13.


Capstone


Meiling Ewing-Chow, “Marine-protected areas as a method for integrating marine resource conservation and fisheries management in the Caribbean: Case study in Trinidad and Tobago, W.I.” Committee: Curtis Burney, Ph.D., and Joshua Feingold, Ph.D. April 12.

Brendan M. Bray, “Establishing and maintaining functional marine-protected areas: A study of the designation and implementation of marine-managed areas.” Committee: James Thomas, Ph.D.; Curtis Burney, Ph.D.; and Brian Blackwelder, J.D. April 28.


Distance Student Uses Distance Technology to Defend His Capstone!

Jane Dougan, director of the distance learning program; students; and staff and faculty members at the NSUOC watched as a student defended his capstone from afar. Mike Loomis defended his capstone titled, “Reef Resilience: Using Marine-Protected Areas to Mitigate Natural and Anthropogenic Impacts to Coral Reef Ecosystems” on April 26, from the US Naval Observatory in Washington, D.C., where he is stationed as an oceanographer, via a televised link to the NSUOC. Also not physically present but linked was Steffen Schmidt, Ph.D., his major professor, who spoke from Iowa State University in Ames, Iowa, where he is a faculty member. Schmidt is an adjunct professor at the NSUOC. Loomis’ PowerPoint presentation was projected on the screen in the classroom for those in attendance to follow as he spoke.
Other News

A pair of tomato clownfish (*Amphiprion frenatus*) have become proud parents. The clownfish were spawned in the center’s 300-gallon display tank on January 27.

Clownfish are monogamous and mate for life, unless something happens, and one is forced to find a new mate. On the evening of February 6, the eggs were removed and transferred to a small aquarium in the laboratory. They hatched at approximately 9:00 p.m.

Captive breeding of marine ornamentals is a growing industry, however at this time only about 15 species of fish are currently bred commercially for the hobby industry. Clownfish were the first marine ornamental fish to be bred for the hobby industry, and many species of clownfish have been successfully bred in captivity.

Captive breeding contributes to coral reef preservation by minimizing damage done by collectors, which includes cyanide and dynamite fishing practices, mostly in the Indo-Pacific. Survivorship is greater, and the price is lower for captive-bred fish.

Mom and dad

As of May, there were approximately 25 survivors, each approximately 1.5 cm in length. Juveniles slowly lose their body bar as they mature. Adults only have the head bar.

This Issue is Dedicated to the Memory of Charles and Lucy Forman.

The last issue of *Currents* lamented the passing of a great friend of the Oceanographic Center and education in general. He was one of eight children born to South Florida pioneer parents, Hamilton M. and Blanche C. Forman. He grew up on land that became Forman's Sanitary Dairy, which eventually became the original campus for Nova High School, Broward Community College, Nova Southeastern University, and Blanche C. Forman Elementary School. Forman himself went on to become a veterinarian.

The Oceanographic Center had its beginning in a houseboat moored in a marina in Fort Lauderdale. Thanks to the generosity of Charles Forman and his surviving brother, Hamilton, construction was begun in 1970 on its present site in Port Everglades, and an 18,000-square-foot building was built. The building is named the Charles and Hamilton Forman building.

In 1990, the center launched its new research vessel, the Lucy W. Forman, during an impressive ceremony at the lab site. Forman’s wife Lucy christened the vessel, which is still in use today.

The Formans continued to maintain a presence at the center, attending as many functions as they could until the death of Lucy in October 1997. Charles Forman was 91 at the time of his death.

Oceanographic Center Student’s Poster at Marine Mammal Symposium a Winner

A poster presented by NSU Oceanographic Center graduate student Scott Withers at the Southeast and Mid-Atlantic Marine Mammal Symposium, held last weekend at NSU, was selected as one of the two best student posters at the meeting. His poster was titled, “The Florida Manatee (*Trichechus manatus latirostris*) Papillomavirus: Can It Help Prevent Human Cervical Cancer?” The SEAMAMMS meeting included spoken and poster presentations by students and scientists from Florida, North Carolina, South Carolina, and Virginia, with a total attendance of about 75.

(Left to Right) Richard Dodge with Lucy and Charles Forman at research vessel dedication

Scott Withers with his winning poster
Feeding the baby clown fish

Charles Forman

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