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National Coral Reef Institute Celebrates Its Fifth Anniversary

L-R: Kelly Dodge, Paul Arena, Barbara Dodge, Carol Fretwell, Catherine Craddock, Nancy Moore, Ron Ryan, and Roberta Harris.

Almost an unheard of feat around the Oceanographic Center, more than 100 people managed to keep a secret! NSUOC Dean and National Coral Reef Institute Executive Director **Richard (Dick) Dodge** was feted at a surprise fifth anniversary celebration of the NCRI at a lunchtime dessert party in the houseboat on October 14. More than 50 NCRI friends and family members gathered from the NSUOC, and NSU's main and University Park campuses to mark the occasion and to reflect upon what and who it took to achieve this milestone.

Contributions of the many folks who have and continue to make NCRI possible were recognized in a light-hearted celebration. "It's almost like a village, but in this case, it is various NSU university departments working together that have made NCRI the respected research institute it has become," said emcee **Carol Fretwell**. "For that—and so MUCH more—we thank you!" So began a retrospective celebration of NCRI's first five years.

Ruth Lazarus, Melissa Dore, Peggy Oellrich, and **Marcy Henning** were recognized for their fine contributions to NCRI. **Amy Paine, Stephanie Morris,** and **Abby Renegar** were honored for being among the first NCRI conference team, as were **Mike Hoke, Heather Halter**, and **Becky Freeland** for their stalwart contributions as editorial assistants to *Coral Reefs*.

Thanks were given to Ron Ryan and Roberta Harris of NSU's Office of Publications, and *Currents* editor **Kathy Maxson** for helping to spread the NCRI name around the globe. **Kevin Kohler** and **Pat Quinn** were thanked for their tireless computing work to keep NCRI wired to the outside world, while **Lance Robinson, Brian Ettinger,** and **Shaun Gill** were thanked for all their work in keeping the NSUOC research fleet maintained and ready.

Doctoral candidates **Paul Arena, Kevin Helmle, Lance Jordan, Pat Quinn,** and **Brian Walker** were recognized as those who we hope will continue the NCRI legacy in a broad range of fields. M.S. students **Brian Ettinger, Dan Fahy, Elizabeth (Glynn) Fahy, Shaun Gill, Heather Halter, Erin Hodel, Mike Hoke, Ryan Moyer, Vince Richards, Judy Robinson, Lauren Shuman, Susan Thornton, Jamie Vernacchio,** and **Herman Wirshing** were all recognized for their contributions to NCRI projects, or presentation of their own projects at various meetings, have contributed to furthering the name of NCRI.

NCRI Executive Director **Dick Dodge**, original Research Director **Jim Thomas**, and Research Scientist **Dave Gilliam** were honored for their hard work that has made

The cake!

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NCRI successful. **Richard Spieler** was recognized for his work with the Memphis restoration project and numerous Broward fish censuses. **Joshua Feingold** was mentioned for the ACCRA, a monitoring project in the Bahamas. **Bernhard Riegl, Bernardo Vargas-Angel,** and **Mahmood Shivji** were also recognized for their research contributions and capabilities.

Enjoying the party. (Seated) Dick Dodge and student Michael Hoke. Behind them (L-R) are Missy Dore, Bernardo Angel-Vargas, Erin Hodel, Heather Halter, and Abby Renegar.

Current NCRI research projects include:

- *Restoration Design and Post-Restoration Monitoring Project (Collaborative with Broward County*
- *Large-Scale Coral Reef Mapping*
- *Classification of Reef Habitats and Environments with Remote Sensing and Mapping*
- *Establishment and Maintenance of a Coral Nursery*
- *Fish Census of Selected Artificial Reefs in Broward County*
- *Investigations on Marginal Reef Systems: Ecology, Genetics, Propagation, and Population Dynamics of* Acropora cervicornis *off Fort Lauderdale, Florida*
- *Investigations on Coral Density and Coral Climate Relations*
- *Molecular Genetic Assessment of the Effects of Dispersal Potential and Life-History Strategy on Population Connectivity and Biodiversity in Coral Reef Invertebrates: Application to Marine Protected Area Design*
- *Multivariate Examination of Spatial Patterns of Grunt (Haemulidae) Recruitment*
- *Molecular Genetic Assessment of Biodiversity and Phylogenetic Relationships in the Gorgonian Family Plexauridae* (Anthozoa: Octocorallia)

Looking Back

"Looking back at the cover story for the fall 1998 *Currents*, announcing NCRI as a 'new' institute, it's hard to believe that it has been five years," said **Carol Fretwell**, coordinator of administrative operations for the National Coral Reef Institute housed here at the OC. "At that time, we had one project in mind, an international conference. We were so worried that no one would come!" In fact 500 people came, almost overwhelming the Radisson Bahia Mar on the beach in Fort Lauderdale, where plans had called for only 200 attendees. Coral reef scientists, resource managers, technicians, and conservationists came from 34 countries, plus the United States territories of Puerto Rico, the U.S. Virgin Islands, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI).

"Now we have seven scientists (Ph.D.'s) spearheading a broad range of projects assisted by several NSUOC graduate students."

The mission of NCRI continues to be to fill gaps in knowledge and research and to overcome constraints in scientific knowledge of reef structure and function relating to issues of assessment, monitoring, and restoration. Through active research programs and collaborations, NCRI undertakes and facilitates hypothesis-based scientific research in emerging reef issues and technologies. NCRI provides scientific synthesis and evaluation criteria of existing programs for use by the research and management community, including study of minimally impacted, stressed, and imminently threatened and endangered reefs. Assessing, monitoring, and restoring biodiversity is a priority, especially as it affects and interacts with ecological processes, overall reef function, and reef recovery. NCRI provides a strong scientific focus as well as innovative approaches to relevant scientific issues in coral reef biology and geology. The institute will continue to

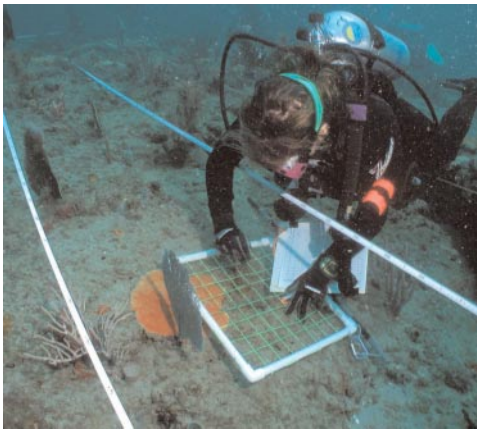
- identify constraints in current scientific understanding of assessment, monitoring, and restoration of reefs
- provide scientific focus to emerging and innovative approaches to these issues
- assess, document, and monitor biodiversity levels of ecologically important reef organisms
- conduct hypothesis-based research
- evaluate and synthesize scientific information relevant to scientists and marine resource managers
- provide scientific expertise to investigate ecological processes and information on global coral reef issues
- identify, fund, and provide theoretical and applied programs of coral reef research
- coordinate expertise and resources for quick response to damage situations, as well as to provide information on alternatives for long-term action
- provide professional assistance in resolving claims and disputes with respect to reef protection, mitigation, and rehabilitation. (Such assistance is available to both responsible parties and to trustees of injured reef resources.)
- recommend and advise on coral reef management and public policy
- publish scientific, technical, and other relevant findings in dedicated, peer-reviewed publication series
- provide effective education (teaching and training) for undergraduates, graduate students, engineers, attorneys, resource managers, and scientists on effective practices, methods, and subjects related to reef conservation and restoration/remediation
- interface with national and international agencies and institutions about coral reef issues

NCRI News

NCRI To Monitor Coral Reefs

Concerned about the health of the region's coral reefs, the state of Florida Department of Environmental Protection requested and received funds from the National Oceanic and Atmospheric Administration to set up reef monitoring stations off Broward, Palm Beach and Miami-Dade counties, expanding an ongoing study in the Florida Keys. The Florida Marine Research Institute (FMRI), which manages the Keys program for the state, contracted NCRI to establish sites and to manage and collect the monitoring data. There are 10 monitoring sites: three in Dade County, four in Broward County, and three in Palm Beach County. NCRI will work with FMRI (part of the Florida Fish and Wildlife Conservation Commission) to analyze the data and produce documents that discuss temporal changes in the East Coast coral communities and compare these communities in the Keys. Using digital video cameras and other equipment, NCRI researchers plan to take annual surveys at the 10 sites where stainless-steel markers have been placed that will allows them to see whether the coral cover is growing or shrinking, which species of coral are doing well and which are not, as well as the effect of events such as hurricanes.

The project manager for NCRI is **David Gilliam**, Ph.D., who is working with representatives from each county, Carl Beaver, Ph.D., and Walter Jaap of FMRI. **Captain Lance Robinson** and research associates **Brian Ettinger**, **Dan Fahy**, **Elizabeth Glynn**, **Brian Walker**, **Lauren Shuman, Shawn Gill,** and **Jamie Vernacchio** will also be assisting with the project.



Lauren Shuman on bioerosion survey

FMRI and NCRI personnel aboard Broward County's R/V Thomas L. Sullivan. *(Seated l-r): Jamie Vernacchio, Dan Fahy and Dave Gilliam. (Standing l-r): Elizabeth Glynn Fahy, Walter Jaap, Slade Stopher, Ken Banks, Brian Ettinger, Selena Kupfner, Carl Beaver, Jim Kidney, Mike Callahan, and Brian Walker. At the helm is Captain Lance Robinson.*

Beach Renourishment Project

As you have probably heard, Broward County is currently engaged in the design of a Shore Protection Project that will restore the beaches of Broward County in Segment III (from Port Everglades to the Miami-Dade line), which involves the dredging and pumping of sand from designated burrow areas onto the shoreline. The National Coral Reef Institute and Broward County have begun an experimental research project to study the histological/physiological effects of increased sedimentation on benthic cnidarians. The cnidarians selected for this project are the scleractinian corals *Montastraea cavernosa*, *Siderastrea* spp., and *Solenastrea bournoni*. Experimental specimens were subjected to the sprinkling of sand, as evenly as possible, over the tanks, at a rate of ~1.4 g cm^{-2} once per day for five weeks. The long-term goal of this experiment is to develop a tissue stress index to assess coral tissue responses to increased sedimentation, including tissue condition, mucus cell appearance, and mucus production, as well as to assess the presence of bleaching and tissue necrosis. Based on this index, divers in the field will be able to rate the level of stress as dredging activities take place, resulting in increased sedimentation and turbidity in the water column. The end goal is to evaluate the degree of stress to the benthic communities during the beach renourishment activities, and thus to provide recommendations for the temporal suspension of dredging activities in a particular area as needed. NCRI research scientist **Bernardo Vargas-Ángel, Ph.D.**, heads this project, which includes the work of OC students **Heather A. Halter** and **Erin C. Hodel**.

This study has benefited from the valuable volunteer efforts of Maddy Kwapinska, Brendan Bray, Abraham Smith, Melody Rhodes, and Michelle Stuart.

Experimental corals collected off Fort Lauderdale, and placed in 2.5-gallon aquaria. Treated colonies received carbonate sand (<500 mm) rate of approximately 150 mg/cm^2/day during the five-week period.

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Corals, Camels, Cactus, Reefs, and Rainforests—NCRI collaborative research projects in the United Arab Emirates, Mexico, and the Bahamas

NCRI has participated in several studies that have investigated corals in several very different environmental settings. Combinations of optical remote sensing and acoustic ground discrimination survey were performed with a variety of partners in the Arabian Gulf, Mexico, and the Caribbean. **Bernhard Riegl,** Ph.D. went to Dubai in February to acoustically map coral reefs off Jebel Ali in collaboration with Mohammed Abdelrahman Hassan of the Dubai Municipality and Sam Purkis of the Free University of Amsterdam. The project combined advanced optical remote-sensing using Landsat, Aster, and Ikonos satellite imagery with acoustically derived bathymetric and ground-discrimination models. Riegl took a similar approach in March and April when he went to Baja California, Mexico, as part of a sedimentology project led by Jochen Halfar of Stuttgart University and Lucio Godinez Orta of CICIMAR, a division of Mexico's Instituto Politecnico Nacional. Four areas were surveyed acoustically in Baja California to demonstrate changes in carbonate sedimentation with increasing latitude. Three M.S. theses at Stuttgart University will use the acoustic data. The group also obtained Ikonos satellite imagery of the Cabo Pulmo reef, which is generally considered the northernmost coral reef of the Pacific Ocean.

In July, Riegl joined forces with Eugene Rankey of the Rosenstiel School of Marine and Atmospheric Science at the University of Miami to investigate the sand shoals of the Lilly Bank and nearby coral reefs on the Little Bahamas Bank. The aim was, again, to acquire acoustic datasets that could enhance the information obtained with satellite imagery (Landsat and Ikonos). The data from all three regions will be used in a collaborative project with Purkis of the Free University of Amsterdam to develop a robust optical bathymetry algorithm that can be used with minimal requirements for atmospheric and water-column correction.

NCRI base camp near Jebel Ali in the United Arab Emirates. The computers were powered from car batteries, the torches gave light. Camels provided the entertainment.

NCRI Provides Feedback on NOAA's CoRIS

On July 15 NSUOC Dean and NCRI Executive Director **Richard Dodge** and OC and NCRI senior programmer **Kevin Kohler** were invited participants in a NOAA-sponsored workshop to gather user feedback on their Coral Reef Information System (CoRIS) Web site *www.coris.noaa.gov*. The meeting was held at the University of Miami Rosenstiel School of Marine and Atmospheric Science (RSMAS).

Attendees of the workshop included coral scientists, programmers, environmental advocates, teachers, and GIS specialists. The full-day event allowed the attendees to navigate the CoRIS Web site in detail to locate any problems. The feedback focused on usability and internal consistency, and will allow NOAA to refine the Web site to better serve interested users. A large portion of the workshop was devoted to the interaction with the large database linked to the Web site, which enables users to perform sophisticated queries pertaining to available data products for a given geographical area. The data products include chart images, tide stations, paleoclimatological studies, photo mosaics, coral reef monitoring, and bleaching reports.

Fieldwork

In March, NCRI research scientist **James D. Thomas,** Ph.D., and research assistant **Vince Richards** visited Carrie Bow in Belize to do field collecting work for a genetics project Richards is working on in **Mahmood Shivji's** lab. They were based at a lab run by the Smithsonian Institution.

In June, NCRI research assistant **Ryan Moyer** and NSUOC Professor **Charles Messing**, Ph.D., went to the Bahamas to do deep water surveys, but bad weather hampered much of the work. In July, another NCRI crew, headed by research scientist **David Gilliam**, Ph.D., and composed of NCRI staff members **Brian K. Walker**, **Brian Ettinger**, **Jamie Vernacchio,** and **Elizabeth Glynn**, had better luck on the shallow water dive trip in the Bahamas in late July and early August.

National and International Scientific Meetings Attended by NCRI

NCRI scientists and M.S. students affiliated with NCRI have presented their work and taken the opportunity to find out about the work of other scientists in a variety of meetings recently. Such opportunities to interact in person can lead to future opportunities for collaboration or individual work, in the near term and in the future.

NCRI's Bernhard Riegl co-leads a field trip to Triassic coral reefs in the Austrian Alps for the First Austrian Reef Workshop held at the University of Vienna. The picture shows participants having lunch on a mile-high coral reef. Behind them are the famous Loferite lagoonal sequences.

Benthic Ecology Meeting

Herman Wirshing, with the cosponsorship of NCRI, participated in the Benthic Ecology Meeting held March 27–30, 2003, in Groton, Connecticut, sponsored by the University of Connecticut. This conference focused on the ecology of marine benthic organisms, spanning all biological kingdoms, with an emphasis on major invertebrate groups. Wirshing gave an oral presentation concerning the molecular systematics of gorgonian octocorals in the family Plexauridae using mitochondrial DNA sequence data, titled "A mitochondrial DNA perspective of phylogenetic relationships in the gorgonian family Plexauridae (Anthozoa: Octocorallia: Holaxonia)."

Joint Everglades and Florida Bay Meeting

Richard E. Dodge, Ph.D., was the moderator for a 10-presentation session titled "Southeastern Coastal Ecosystems," at the Greater Everglades Ecosystem Restoration (GEER) Program, part of the Joint Conference on the Science and Restoration of the Greater Everglades and Florida Bay Ecosystem, held April 13–18 in Palm Harbor, Florida. He also coauthored a poster with doctoral candidate **Kevin P. Helmle** titled "Past Stony Coral Growth (Extension) Rates on Reefs of Broward County, Florida: Possible Relationships with Everglades Drainage."

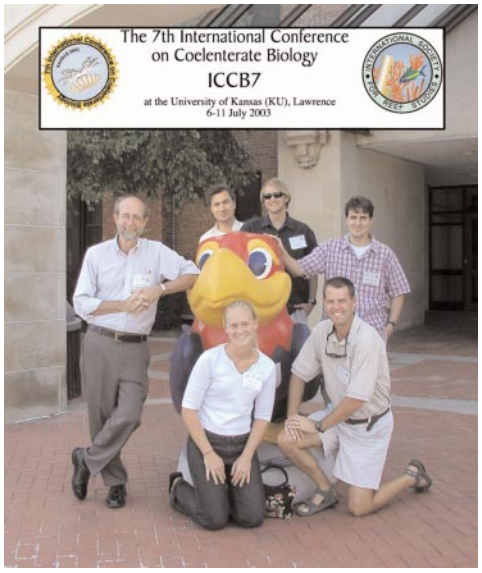
First Austrian Reef Workshop

In May, **Bernhard Riegl**, Ph.D. delivered a keynote speech at the First Austrian Reef Workshop at the University of Vienna, Austria. The talk was titled "Global Climatic Change and Coral Reefs: Issues for Science and Management" and was aimed at providing a multidisciplinary view of coral reef science in recent oceans. An overview of the fossil component of coral reefs was given by Robert Stanton, Ph.D., of Texas A&M University (now retired). Prior to the workshop, Riegl led a field trip to Miocene exposures of coral reefs and coral carpets. After the workshop, he joined Ph.D.'s Diethard Sanders, Martin Zuschin, and Werner Piller, who led a field trip to Triassic coral reefs in the Austrian Alps.

Seventh International Coelenterate Biology conference, and U.S. meeting of ISRS

The University of Kansas played host to the Seventh International Conference on Coelenterate Biology, and the U.S. meeting of the International Society for Reef Studies (ISRS) July 6–11. NSUOC Dean and NCRI Executive Director **Richard E. Dodge,** Ph.D., led the NCRI contingent, composed of NCRI research scientists, **David S. Gilliam,** Ph.D., and **Bernardo Vargas-Ángel,** Ph.D., NCRI biological and geographical information specialist and NSUOC Ph.D. candidate **Brian K. Walker**, NCRI graduate research assistant **Heather Halter,** and M.S. student **Herman Wirshing**.

As a member of the ISRS Council and editor of the ISRS journal *Coral Reefs*, Dodge also participated in ISRS membership and council meetings during the conference.



Kneeling: Heather Halter, David Gilliam. (Standing l-r): Dick Dodge, Bernardo Vargas-Angel, Brian Walker and Herman Wirshing.

During the conference, NCRI/NSUOC personnel presented four oral and one poster presentations. Vargas-Ángel's talk was based upon his research on the reproductive biology and ecology of *Acropora cervicornis*. Halter's presentation was based upon the experimental research project started by NCRI and Broward County to study the histological/physiological effects of increased sedimentation on benthic cnidarians.

- "Histological examination of sediment exposure on *Montastrea cavernosa*

(Linnaeus)—Preliminary results," by **Heather Halter**, **Bernardo Vargas-Ángel**
- **"**Fragmentation in *Acropora cervicornis*: Survivorship, extension rates, and sexual reproduction off the coast of Fort Lauderdale, Florida, USA," by **Bernardo Vargas-Ángel, James Thomas, S. Michael Hoke**
- "Global warming and range shifts of acroporid corals," by William Precht, Richard Aronson, Sarah Bernhardt, **James Thomas**
- "Phylogenetic relationships in the gorgonian family Plexauridae (Anthozoa: Octocorallia: Holaxonia) based on two mitochondrial genes," by **Herman Wirshing, Charles Messing**, John Reed, Mike Stanhope, **Mahmood Shivji**
- "A successful teamwork approach to coral reef injury assessment, primary restoration, compensatory restoration, and monitoring," (poster) by **Brian Walker**, **David Gilliam**, **Richard Dodge**, Timothy Blankenship, Christy Brush, Jack Holland

Following the conference, Wirshing stayed in Kansas City to participate in a post-conference Octocoral Workshop, July 12–13. He was one of 10 participants, among scientists from Colombia, India, Israel, Italy, Japan, Korea, and Mexico. Chief among the topics explored were Octocorallia classification, phylogeny, and diversity, as well as opportunities for collaborative projects, such as the Worldwide Octocoral Biodiversity (WOB) Project.

Herman Wirshing (far left) at Octocoral Workshop

Ninth Fossil Cnidaria and Porifera Symposium in Graz, Austria

Bernhard Riegl, Ph.D., research scientist for NCRI, and **Kevin Helmle**, NCRI research assistant and OC Ph.D. candidate, attended the Ninth International Symposium on Fossil Cnidaria and Porifera, Graz 2003 in Graz, Austria, August 3–7. Riegl (who earlier had served as a member of this symposium's organizing committee) served as a co-chair of the session titled: "What Coral Frameworks Can Tell about Paleoecology". Helmle presented the poster "Oldest Coral Bands in the Triassic of North America and the Evolution of Photosymbiosis," by K.P. Helmle and G.D. Stanley, Jr.

NESDIS Data User's Workshop, Boulder

Kevin Helmle, NCRI research assistant and NSUOC Ph.D. candidate, attended and participated in the National Environmental Satellite, Data, and Information Service (NESDIS) Data Users' Workshop June 11–12 in Boulder, Colorado. Four major sources of NESDIS data were considered: National Climatic Data Center (NCDC), National Oceanographic Data Center (NODC), National Geophysical Data Center (NGDC), and the Office of Satellite Data Processing and Distribution. In addition to informing users and seeking feedback for users' needs, the meeting also included a keynote address by Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.), undersecretary of commerce for oceans and atmosphere and NOAA administrator, and a tour of the NOAA offices at David Skaggs Research Center in Boulder. Almost as valuable as any other part of the workshop were the handouts, including "NOAA's Strategic Plan for FY 2003–2008 and Beyond;" NOAA careers guidebooklet; several documents and CDs regarding climate database resources, including information about the *Climate Atlas of the United States*, NOAA Marine Environmental Buoy Data, the U.S. Climate Reference Network, and the World Data Center for Paleoclimatology, and other NOAA products and services. As a direct result of Helmle's trip, direct links have been set up between the NGDC Paleoclimatology Program Web site and the NCRI Web site, permitting users to directly download Coral*XDS*, a software program developed by **Kevin Kohler**, Helmle, and **Richard Dodge**, through the NOAA Web site.

31st AMLC Meeting, Trinidad—Reef Recon, Tobago

NCRI research scientist **Bernhard Riegl**, and research assistant **Ryan Moyer** attended the 31st Scientific Meeting of the Association of Marine Laboratories of the Caribbean (AMLC), held July 14–18, 2003, at Port of Spain, Trinidad. Riegl gave a talk entitled: "Determination of the Distribution of Shallow-Water Sea Grass and Drift Algae Communities with Acoustic Remote Sensing," by B. Riegl, R.P. Moyer, L. Morris, R. Virnsten, G.S. McIntosh, and **R.E. Dodge**. Moyer presented two posters: "Accuracy Assessment of Acoustic Remote-Sensing Data from a South Florida (Broward County, USA) Coral Reef System," by R.P. Moyer, B. Riegl, and R.E. Dodge; and "Benthic Macrofaunal Distributions on the Southeastern Florida Platform Margin (65–200m)," by **C.G. Messing**, R.P. Moyer, R. Shaul, **B.K. Walker**, and **R.E. Dodge**. Riegl and Moyer each also submitted research papers for publication in the forthcoming proceedings of the meeting. During the meeting, Riegl gave a presentation about research going on at NCRI and the NSUOC to AMLC officers, who promptly voted to enroll NCRI and the NSUOC as a member of the Association of Marine Laboratories of the Caribbean. They met with Richard Langton and Owen Day of the Buccoo Reef Trust in Tobago in an excursion organized by Robert Ginsburg of RSMAS. They investigated various sites for future reef assessments. On behalf of NCRI, Riegl congratulated the Buccoo Reef Trust for excellent scientific and educational work aimed at protecting Tobago's coral reefs.

Also during the meeting, Riegl and Moyer joined a team of scientists on a reconnaissance survey of the coral reefs in Tobago. The team explored several locations at Buccoo Reef in southwest Tobago, as well as several sites at Speyside Reef in the northeast of the island. The team found

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some remarkable coral colonies growing at Speyside Reef, including extensive carpets of yellow pencil coral and larger-than-expected brain corals. The recon team was hosted by Richard Langton of the Buccoo Reef Trust, and consisted of Bernhard Riegl and Ryan Moyer (NSU/NCRI), Robert Ginsburg and Gerald Ault (University of Miami/RSMAS), John Brock (United States Geological Survey), and Andy Bruckner (NOAA).

NCRI joined the Association of Marine Labs of the Caribbean and participated in their 31st Scientific Meeting in Port of Spain, Trinidad. Seen here are NCRI's Ryan Moyer and Bernhard Riegl, Andy Bruckner (NOAA), Robert Ginsburg (RSMAS), John Brock (USGS), and Richard Langdon (Buccoo Reef Trust) on Tobago.

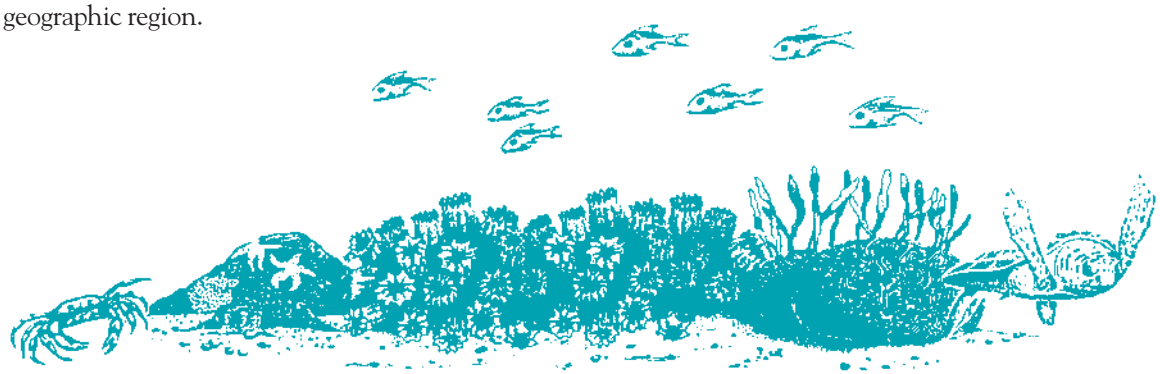
During their annual membership selection meeting, the AMLC board of directors unanimously accepted the **National Coral Reef Institute (NCRI)** at the NSUOC as their newest member institution. The AMLC is a network of scientists and marine laboratories who conduct a variety of scientific work within the greater Caribbean region. Membership in the AMLC is a great opportunity for the staff and students at NCRI and the NSUOC to network and collaborate with other scientists working in the same geographic region.

Gulf of Mexico Fishery Management Council, Coral Scientific and Statistical Committee

A special Coral Scientific and Statistical Committee Meeting was held October 27–28 at the Tampa Airport Hilton Hotel. Status and trends of benthic reef resources of the Gulf of Mexico, the Florida Keys, and Southeast Florida were discussed.

PowerPoint presentations were given on Pulley Ridge, Florida Middle Grounds, Florida Keys National Marine Sanctuary (FKNMS), and Dry Tortugas National Park, courtesy of Walt Jaap. **Dick Dodge** presented on deep-water and Lophelia corals. There were discussions on habitat virtues and on Flower Garden Banks National Marine Sanctuary (FGBNMS). In general coral resources at FGBNMS have been stable for many years. The trend in FKNMS is a 37 percent loss of coral cover since 1996. At Dry Tortugas the trend is also of loss, but not as severe as in the Keys. 10 new monitoring stations for the Florida Coral Reef Evaluation and Monitoring Program are being added in Dade, Broward, and Palm Beach counties and are being conducted by NCRI.

(Seated): Judith Lang (Retired), [Committee Member]; Roy William (FWC-Fisheries).
(Standing, l-r): Walter Jaap (Florida Marine Research Institute—Fish and Wildlife Commission), [Committee Member]; Richard Dodge (NSUOC/NCRI), [Committee Member]; Officer J. Willoughby (NOAA, NMFS—Law Enforcement); Martha Robbart (PBS&J); Rick Leard, Gulf of Mexico Fishery Management Council; Anne Alford (GMFMC).



People on the Move

Charles Messing, Ph.D., recently returned from an almost world-circling two-week trip, first to Europe and then to the north Pacific. From October 5–10, he attended the 11th International Echinoderm Conference at Ludwig-Maximilians University, Munich, Germany, where he presented two papers: "A modern, soft-bottom, shallow-water tropical crinoid fauna, with a comparison between living *Comatula rotalaria* and fossil *Uintacrinus socialis* (Echinodermata: Crinoidea)," coauthored with D.L. Meyer (University of Cincinnati), U.E. Siebeck, D.I. Vaney (University of Queensland, Vision, Touch and Hearing Research Centre), L.S. Jermiin (University of Sydney) and G.W. Rouse (South Australian Museum), and "Recognition of species in extant Crinoidea," coauthored with **Herman Wirshing**, **Mahmood Shivji** and G. W. Rouse." The latter included results from a 2002–2003 NSU President's Faculty Scholarship Award.

After flying from Munich to San Francisco, Messing joined chief scientist David Clague, Ph.D. (Monterey Bay Aquarium Research Institute), for a weeklong research cruise aboard MBARI's *R/V Western Flyer* to explore the geology and biology of extinct volcanic seamounts off the California coast. Gale-force winds and high seas forced a change in the cruise plan, which originally involved a visit to the Taney Seamounts off San Francisco Bay. Instead, the ship and crew headed south to the previously unexplored Pioneer and Rodriguez seamounts. Here, they used MBARI's sophisticated ROV *Tiburon* to explore a series of extinct volcanic cones from depths of about 2,100 m to 600 m. From the comfort of a first-class airliner seat in the shipboard control room, Messing reported seeing enormous trumpet sponges, candelabra bamboo corals, armored sea cucumbers, pancake urchins, and acres of crinoids. Readers of this newsletter will recognize crinoids as sea lilies and feather stars. He collected at least six species, two of which are likely new to science. The mountain of data suggests that Messing has his work cut out for himself.

The Tropical Marine Fish Ecology field course took place between July 20–26, at the Keys Marine Lab on Long Key, Florida. A total of 12 graduate students were involved in the course led by **Richard Spieler**, Ph.D. Many of the graduate students were involved in collecting specimens by hook and line off the bridges on Long Key.

Graduate students enjoying a beautiful day at the Keys Marine Lab. (l-r): Nick Rauter, Brian Tinsey, T.A. Paul Arena, David Bryan, Brettany Cook, Michele Morgado, Abe Smith, Marisa Magrino, Shaun Gill, Jennifer Becker, Erin Hodel, Nikki Roddy, and Jonna Licona.

A proud T.A.! Paul Arena looks on after graduate student David Bryan pulled in a bonnethead, Sphyrna tiburo.

Publications

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Piller, W.E. and B. Riegl (2003). Vertical versus horizontal growth strategies of coral frameworks. *International Journal of Earth Science* 92(4):511–519.

Moyer, R. P., B. Riegl, and R. E. Dodge (2003). Spatial patterns and ecology of benthic communities on a high-latitude south Florida (Broward County, USA) reef system. *Coral Reefs*, 22. (In press)

Hoshino, K., M. Brandt, C. Manfrino, S. C. C. Steiner, and B. Riegl (2003). Assessment of the coral reefs of the Turks and Caicos Islands (Part 2: Fish). *Atoll Research Bulletin* 496: 480–499.

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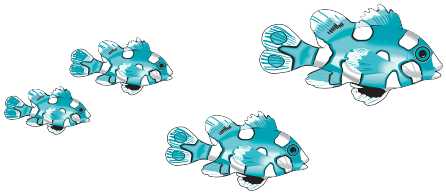


NSTA Press (the book-publishing arm of the National Science Teachers Association) will be reprinting an article **Veljko Dragojlovic** coauthored for the *Journal of College Science Teaching* ("Demonstrating Allotropic Modifications of Sulfur," Dec. 2001/Jan. 2002) in a compilation of 38 "Favorite Demonstration" articles from 1993 to 2003.

OTHER NEWS

Outboard Motor Donated

During the first week of October, **Honda Marine** held a dealer meeting at the Boca Raton Resort and Club (BRRC) in Boca Raton, where about 500 of their dealers from around the country were introduced to a new size of Honda outboard engine, 150 hp. To acquaint their dealers with this new engine, Honda held on-water demonstrations of the engine, putting it on more than 25 different boats from 15 different manufacturers. These on-water demos were primarily going to take place in the ocean, but in case of bad weather, and because some of the boats don't do well in the ocean, they wanted to use the Intracoastal Waterway near the resort.

Ed Keith showing off the Honda motor that was donated to the center.

Because they wanted to demonstrate the operational capabilities of these engines at high speed, they applied to the Fish and Wildlife Conservation Commission for a variance of the speed limit (25 mph) in this part of the waterway. The commission granted the variance, but required that Honda Marine and the resort implement a manatee watch program, to make sure that there were no manatees in the area prior to the start of the high-speed demonstrations, and to make sure that no manatees entered the area during the demonstrations.

Ed Keith, Ph.D., was contacted by BRRC and asked if the Oceanographic Center could assist with the manatee watch program. Keith developed a plan, submitted it to the commission, and received approval. OC students served as observers, and the *R/V Explorer*, the center's biggest research vessel, was also used. The group assisted with the on-water demos on October 3, 6, and 7.

In appreciation for their efforts, Honda Marine donated a 225 hp engine to the OC, which will be put on another of the center's vessels, the *NSU Ranger*, after it is converted from inboard-outboard propulsion to outboard propulsion.

Visiting Ph.D. Candidate

John Foster, a Ph.D. candidate from the University of Mississippi, visited **Jim Thomas**, Ph.D., October 15–18 to collaborate on Foster's research. Thomas is on Foster's Ph.D. committee and they worked on identifying deep-water amphipods from the Texas A & M Gulf of Mexico project. Funded by the Minerals Management Service, this project is the first comprehensive effort to sample deep Gulf of Mexico communities for species diversity. Samples have been taken down to 3,000 meters in depth.

Great White Shark Research in South Africa

For the past two years M.S. student, **Neil Hammerschlag** has been working for The ReefQuest Centre for Shark Research in False Bay, South Africa, where they have been conducting research expeditions to study South Africa's legendary flying great white sharks. In the summer of 2003, Hammerschlag returned to South Africa to continue ReefQuest's ongoing shark research, as well as to collect data for his master's thesis project on white shark predatory activity.

Predation is one of the most fundamental interactions in nature and one of the most inherently fascinating; but, white sharks are relatively rare and predation of any kind is seldom observed in the wild. As a result, little to nothing is known about white shark predation. However, Seal Island in False Bay, South Africa, provides a unique opportunity to observe natural predation by white sharks on cape fur seals. Seal Island has become famous for a spectacular white shark behavior known as the 'breach,' in which

Continued on page 10

a white shark explodes from the ocean with a seal in its mouth, in an awesome display of power and acrobatic prowess.

Breaching! A great white takes a seal. (Photo by Neil Hammerschlag)

For his master's thesis, Hammerschlag is evaluating the factors that affect white shark feeding success on cape fur seals. The data collected is already beginning to show that several factors including water depth, light availability, wind direction, size of seal, and distance from the island affect how successful a white shark will be at prey capture. Included on Hammerschlag's committee are (Ph.D.'s) Mahmood Shivji, Edward Keith, Mark Farber, and new adjunct professor R. Aidan Martin.

Before the expedition began on July 1, Hammerschlag selected three research teams of five each from more than 400 applicants to join him and ReefQuest in South Africa for the expedition. Included on the team were NSUOC M.S. students **Brendan Bray**, **Greg Foster,** and **Kristi Foster.**

To help determine what factors affect white shark predatory success, four companies sponsored the research expedition with crucial equipment. Oregon Scientific donated two weather recorders, Endeco/YSI sponsored the team with two water-quality measuring units, the Ben Meadows Company donated a remote weather station, and LI-COR Biosciences sponsored two PAR sensors. In addition, the South African Navy Hydrographic Office and Institute of Maritime Technology lent support to the research by donating some important environmental data.

While in False Bay, Hammerschlag also gave a lecture on shark biology at South Africa's Institute of Maritime Technology to an audience from the South African Navy, the Institute of Maritime Technology, and the Navy Diving School.

Over the course of the 2003 expedition, the research team witnessed more than 200 natural predations, and identified over 140 different great white sharks. Data collected by ReefQuest over the past four years brings the total number of individual white sharks catalogued to 262, including numerous re-sightings over separate days and years. Data collected is beginning to show that white sharks at Seal Island exhibit low residence times, strong site fidelity, and numerous identifiable sharks that appear to come and go together in stable groups.

A 14-foot, 2-ton great white shark. (Photo by Neil Hammerschlag)

In addition, data collected brings the total number of documented predator–prey interactions between white sharks and cape fur seals to 401, of which about 40 percent resulted in successful kills. Further, recognizable individual white sharks display distinct predatory strategies and some enjoy a predatory success rate of roughly 80 percent.

For more information on the project please visit *www.elasmo-research.org* and *www.reefquest.com*, or contact Neil Hammerschlag at *neil@reefquest.com*.

Student Joins Marine Mammal Survey Crew

M.S. student **Susan Zaretsky** joined other scientists aboard the NOAA ship *Gordon Gunter* from July 7–August 18, for two of the three legs of the NOAA marine mammal survey in the Gulf of Mexico. During the cruise, which began in Pascagoula, Mississippi, both visual and acoustic surveys of marine mammals were conducted to obtain population estimates of the species that inhabit these waters as well as vocalization recordings. Zaretsky spent the six weeks working with other scientists in conducting the acoustic surveys. Some of the recordings collected will be used in her thesis on the comparison of dolphin vocalizations, under her advisor **Ed Keith**, Ph.D.

(L-R) Kathy Foley (NMFS-Pascagoula), Susan Zaretsky, Tony Martinez (NMFS-Miami), Sara Hemlich (NOAA-Oregon), Linday Hall (New England Aquarium), and Penny Cohen (grad student at RSMAS-Miami).

Farewell to a Friend

The Oceanographic Center sends its condolences to Valerie Apter on the death of her husband, **Nathaniel S. Apter,** who passed away on September 29 at the age of 90. Upon retiring as a psychiatrist in Chicago, Apter decided to pursue his second love, marine biology, specializing in mollusks. He came to Florida to become an adjunct professor at NSUOC in 1983. He received his 10-year plaque in 1993 and left Florida shortly thereafter, but was kept on as an adjunct until 1995. Apter donated a complete set of the *Works of Darwin*, as well as a 12-volume set of *The Mollusca* to the library. He will be fondly remembered for his kindness and wit.

Nat Apter, 1913–2003
This picture was taken on his 90th birthday.

MASTERCURRENTS
INSTITUTE OF MARINE AND COASTAL STUDIES

Winter Term
January 5–March 26, 2004

M.S. degree specialties are marine biology, coastal zone management, and marine environmental sciences. Each course carries three credit hours or may be audited. Tuition is $525 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 winter term runs from January 5–March 26, 2004 (unless otherwise specified). Registration ($25 nonrefundable fee) is December 8–January 9. For further information, call Andrew Rogerson, Ph.D., or Melissa Dore at (954) 262-3610 or 800-396-2326, or email *imcs@nova.edu*. More information can be found at the Web site *www.nova.edu/ocean/*.

Concepts of Physical Oceanography, OCOR-5601
This course deals with the basic physical properties of seawater, the temperature and salinity structure of the oceans, major current patterns and the influences of waves, tides, and winds. The course focuses on coastal and nearshore processes. **Lab Fee: $30.** Meets: Thursdays, 6:30–9:30 p.m. Instructor: Alexander Yankovsky

Aspects of Marine Pollution, CZMT-0790/MEVS-5100
Deals with various forms of environmental pollution as they affect both the land and maritime environment. Focus on the role of microorganisms as causes and indicators of toxicity. Sources, measurement, and control of pollution in marine and coastal environments are discussed. **Lab Fee: $15.** Meets: Wednesdays, 6:30–9:30 p.m. Instructor: Don McCorquodale (Adjunct Professor)

Plankton Ecology, OCMB-5606
Traditionally, plankton have been dealt with under two broad headings: phytoplankton and zooplankton. While this categorization is useful, it does not reflect current research emphasis of the smaller members of the plankton community: bacteria (picoplankton) and the grazing protozoa (nanoplankton). This course will deal with these smaller members of the plankton community. Plankton Ecology will begin with a summarization of the plankton environment in lakes, oceans, and estuaries. It will continue with the essential aspects of the biology and physiology of bacteria and protozoa. It will finish with the exploration of the functional role of these organisms within aquatic ecosystems. **Lab fee: $15.** Meets: Tuesdays, 6:30–9:30 p.m. Instructor: Andrew Rogerson

Marine and Coastal Water Resource Impacts, CZMT-0622/MEVS-5020
This course is oriented toward a systems analysis of the multiple uses that shape the coastal zone. Emphasis is on the multiple uses of the coastal zone and their associated impacts. In addition, the current balancing of development and environmental protection policies of state and federal government and how these policies have affected the coastal environment are discussed. The course not only deals with specific environmental problems but also analyzes the problems and prospects of effective planning, technical management, regulation, and legislation used for managing the coastal environment. **Lab Fee: $15.** Meets: Mondays, 7:00–10:00 p.m. Instructor: Stacy Meyers (Adjunct Professor)

Scientific Writing, CZMT-0800/MEVS-5300/OCMB-8500
This course is designed to provide tools, resources, and approaches to improve a student's ability to write in a scientifically precise and accurate manner and to interrelate complex conceptual issues in a coherent manner. The skills acquired while learning to write a grant proposal are very similar to the skills needed to write a project plan or scientific paper. Thus, by building grant-writing skills, general scientific writing skills are improved in equal measure. This course is an intensive introduction of how to prepare, write, edit, and review a standard grant proposal. Participants in this course will be expected to write a grant proposal in their field of interest as a class project. Proposal writing is essential in the competitive scientific job market, but it can be intimidating for the novice. There is nothing worse than staring at a blank piece of paper or computer screen with the sinking feeling that so much is riding on the prose you must create. This course will provide the tools and procedures to write and submit a competitive grant proposal. Participants in this course will be expected to be motivated and willing to improve their written and verbal communication skills. There will be an abundant writing load and outside class assignments. **LIMIT 15 STUDENTS. Lab Fee: $30.** Meets: Mondays, 6:30–9:30 p.m. Instructor: James Thomas

DISTANCE LEARNING

Environmental Sustainability, CZMT-0665
This Web-based distance education course highlights more than 25 years of international discussion, debate, and ideas with regard to the state of the environment and our actions towards it. Key considerations and voices are included, from both North and South. This course examines in a cross-cutting approach the environmental and social issues that affect our lives. Students become part of an "international learning community," by participating in online closed discussions. The emphasis is on presenting an international range of perspectives and case studies, linking the issues and ideas to up-to-the-moment occurrences as they affect students, when they happen, and wherever they are.

International Integrated Coastal Zone Management, CZMT-0614
This Web-based distance education course focuses on the international dimensions of integrated coastal zone management. Students will first examine the major big picture issues affecting the world's coastal areas and oceans, and will examine case studies that will help bring alive the grave problems of mismanaging coastal and economic resources: the Black Sea, Newfoundland, the Louisiana region of the Gulf of Mexico, Belize, the Marshall

Continued on page 12

Islands, and Antarctica. The second part of the course will provide students with the opportunity to study major international conferences, treaties, and policy principles (including the Law of the Sea). In the final third of the course, students will examine regional as well as selected country coastal-zone policies. Students completing this course will be familiar with the most important aspects of integrated coastal zone management globally and will have a basis for comparison of these policies. Students will also be in a position to assess the costs and benefits of different coastal zone management strategies around the world.

Introduction to Physical Oceanography, OCOR-5608
Prerequisite: recommended algebra, physics. This course is intended to give students a view to how wind, radiation, gravity, friction, and the Earth's rotation determine the ocean's temperature and salinity patterns and currents. Some important process we will study include heat budget of the oceans, exchange of heat with the atmosphere and the role of the ocean in climate, surface mixed layer, waves in the ocean, geostrophy, Ekman transport, and Rossby waves. Students will learn how to explain physical features of the ocean ranging from microscopic turbulence to global circulation.

Marine Mammal Management, CZMT-0667
An interdisciplinary approach to examining the present state of the relationship between marine mammals, people and the environment: as this has evolved over time, as it stands today, and as it is likely to be for the future, whether by default or design. The marine mammal and environment relationship is extremely complex and fluid. It changes depending upon place and time, and the rate of this change is accelerating along with related developments such as population and economic growth, technological capacity, and our expanding use of the world's oceans and waterways. We will look at the position and influence of marine mammals within the environment, as well as the development of physical conditions, values, and economic activities that have led to their present situation.

Marine Chemistry, OCOR-5605
This course is one of the five "core" courses required for all master's specialties. The class will review the properties and composition of seawater; the importance, distribution, relationships, and cycling of major nutrients; dissolved gasses; trace metals; and organic compounds. A self-paced laboratory is included in the course activities. Problem solving is supplemented with interactive microcomputer work.

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 course work. 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 $3,582 per quarter.

Spring Term
April 5–June 25, 2004

Molecular Biology

Marine Geology

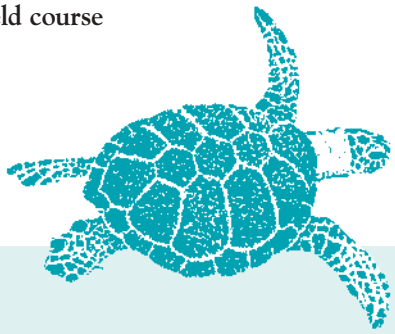
Biostatistics

Descriptive Physical Oceanography of the Continental United States

Deep Water Ecology—field course

Taxonomy and Marine Invertebrates—field course

Ecology of Belize Barrier Reef—field course



Seminars and Defenses

Thesis

Richard L. Hubbard, "Experiments in algal feeds for the Penaid shrimp (*Litopenaeu vannamei*), sea urchin (*Lytechinus variegates*), and marine rotifers (*Brachionus plicatilis* and *B. Rotundiformis*)." Committee members: Curtis Burney, Richard Spieler, and Tom Capo (RSMAS/UM). September 12.

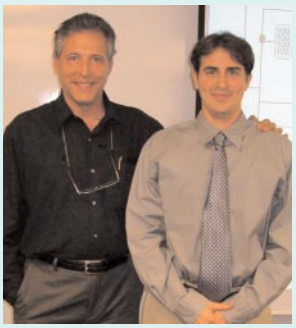
Gwen Hauer, "Salinity tolerance of naked amoebae from freshwater, marine, and hypersaline environments." Committee members: Andrew Rogerson, Charles Messing, and Patricia Blackwelder. September 25.

Megan E. Berkle, "Population densities and feeding behavior of the amphinomid polychaete, *Hermodice carunculata*, in *Acropora cervicornis* assemblages in southeastern Florida." Committee members: Charles Messing, James Thomas, and Bernardo Vargas-Angel. October 2.

Dorothy-Ellen A. Renegar, "Effect of nutrient enrichment and elevated CO^2 partial pressure on growth rate of the zooxanthellate coral *Acropora cervicornis*." Committee members: Bernhard Riegl, Bernardo Vargas-Angel, Curtis Burney, and Patricia Blackwelder. October 3.

Greg Allen Ward, "Long term effects of oil and dispersed oil on mixed seagrass and coral beds: the 18th year of studies following experimental dosing." Committee members: Richard Dodge, Donald McCorquodale, Jr., and Andrew Rogerson. October 23.

Herman H. Wirshing, "Phylogenetic relationships in the gorgonian family Plexauridae (Anthozoa: Octocorallia: Holaxonia) based on two mitochondrial genes: evidence for multiple lineages." Committee Members: Charles G. Messing, Mahmood Shivji, and Sandra L. Romano (University of Virgin Islands). October 24.



Chuck Messing (left) stands proudly with his student, Herman Wirshing, after his successful thesis defense.

Capstone Review

Erik W. Neugaard, "Marine fish assemblage on the deep artificial reefs of Broward County, Florida, USA." Committee members: Richard Spieler and Emily Schmitt-Lavin. Sept. 5.

Chuck Messing Gives a Lecture on Beach for the Sherlock Project

On Thursday, October 23, **Charles Messing**, Ph.D., of NSU's Oceanographic Center, and. J. P. Keener, Ph.D., supervisor of secondary science curricula for Broward Schools, co-hosted the exciting first live broadcast of "The Sherlock Project: Investigating the Natural World" from the Port Everglades entrance channel at John U. Lloyd State Park in Hollywood, Florida.

The Sherlock Project, a partnership between NSU and the School Board of Broward County, is an interactive science-education television program that represents the first time the Broward Educational Communications Network (BECON) used wireless microwave-based teleconferencing technology to beam a program live from the natural environment to Broward public school classrooms. University School science teacher Doug Garber, and four ninth-grade students who collected local environmental data during the show accompanied Messing and Keener. In addition, the co-hosts fielded questions sent in live from four middle schools that participated in the broadcast. The production team broadcast the 40-minute show twice so that different schools could view it during different class periods.

This first episode concerned the concepts of environment, ecosystems, their biotic and abiotic components, and the interactions among them. While Keener discussed the tides and the adaptations of ghost crabs from the sandy beach environment, Messing covered topics such as wave action, trade-offs between getting pounded by waves or drying out, and the adaptations of snails in the rocky intertidal zone. Students in participating schools were clearly paying attention as their questions, beamed live from classroom to the remote production facility, covered a wide range of subjects. They wanted to know about saltwater intruding into South Florida's freshwater resources as well as the differences between male and female crabs.

Future episodes, each based at a different remote location, will cover a wide range of topics, from Newton's laws of motion to dinosaurs and fossils. Each will treat FCAT-related science topics for middle grade students, and include a range of science vocabulary and concepts.

NSU University School students John and Michaela enjoying the lecture by Chuck Messing for the Sherlock Project.

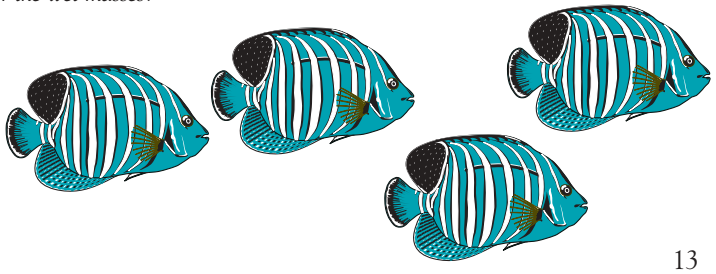
Chuck Messing lecturing on the jetty in John U. Lloyd StatePark

A Wet But Successful Fall Term Party

It rained and it poured, but it didn't dampen the spirits of those who attended the annual fall semester barbeque to welcome new students. Despite the rain, an estimated 100 faculty members and students showed up at the center on September 27 to socialize and have their fill of hot dogs, hamburgers, salads and other goodies. The party followed new student orientation, where incoming students met with Andrew Rogerson, Ph.D., director of the Institute of Marine and Coastal Studies, as well as staff and faculty members who welcomed them to the center.

Undercover at the fall student party

Tom Oellrich, Missy Dore, and Peggy Oellrich cook up hotdogs and hamburgers for the wet masses.

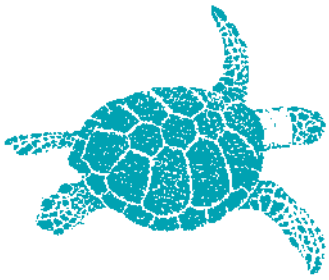


NOVA SOUTHEASTERN UNIVERSITY
Oceanographic Center
8000 North Ocean Drive
Dania Beach, Florida 33004-3078

Currents, Fall 2003

Winners of the annual Chili Cook-Off: (l-r) Captain Bob Franks, Megan Shoff, and Captain Lance Robinson. Texans Shoff and Robsinson tied for first place.

Enjoying the chili cook-off and his birthday, past OC Dean Julian McCreary eyes cake being cut by Kathy Maxson. McCreary was visiting from Hawaii.



Editor: **Kathy Maxson**

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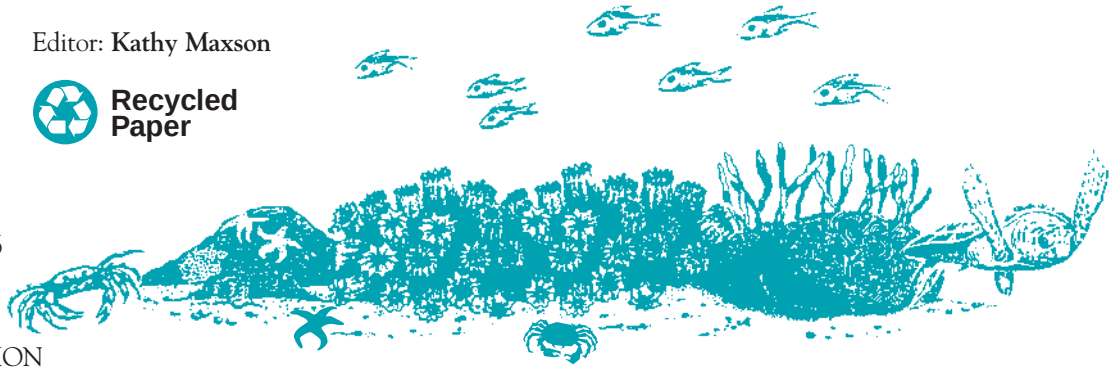

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