



PERRY CURRENTS

Volume 3, Issue 1

Quarterly Newsletter

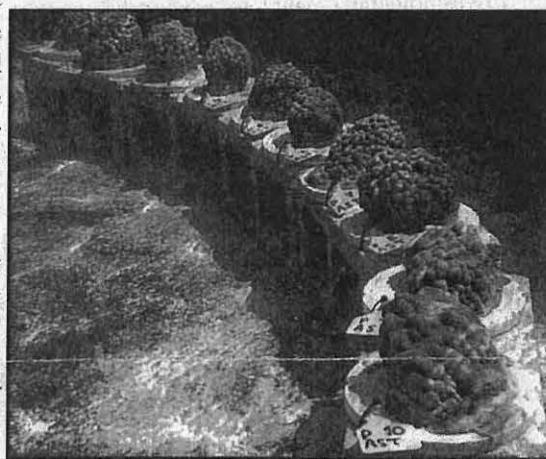
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Coral Reefs—Rainforests of the Sea

By Erich Mueller, Senior Research Scientist

Coral reefs around the world are under increasing stress and showing significant signs of decline. Perhaps of most concern are threats to the corals themselves which are essential for creating and maintaining the foundation of the reef community. The hard, or stony, corals are colonial animals containing one-celled plants (zooxanthellae) within their tissues. Reefs are amongst the most complex ecosystems and the largest biological structures on earth.

In the geologic past, coral reefs that took many thousands of years to form have died due to natural events such as falling sea levels during periods of glaciation. Over more thousands of years, reefs



Coral Culture project at Lee Stocking Island—See article on Page 5

One such stress that appears to result from human activity is global climate change and the associated increase in seawater temperatures. Corals thrive in tropical seas but are actually living quite close to their upper temperature limits. A summer increase of 1-2° C (1.8-3.6° F) above the normal maxima can result in “bleaching” whereby the zooxanthellae living within the corals are damaged. The corals then pale, turning white in severe cases, as the zooxanthellae are lost and the white limestone skeleton shows through the transparent coral tissues. At best, coral growth rates are slowed and return to normal over weeks or months as zooxanthellae populations within the coral recover. At worst, coral colonies, some hundred’s of

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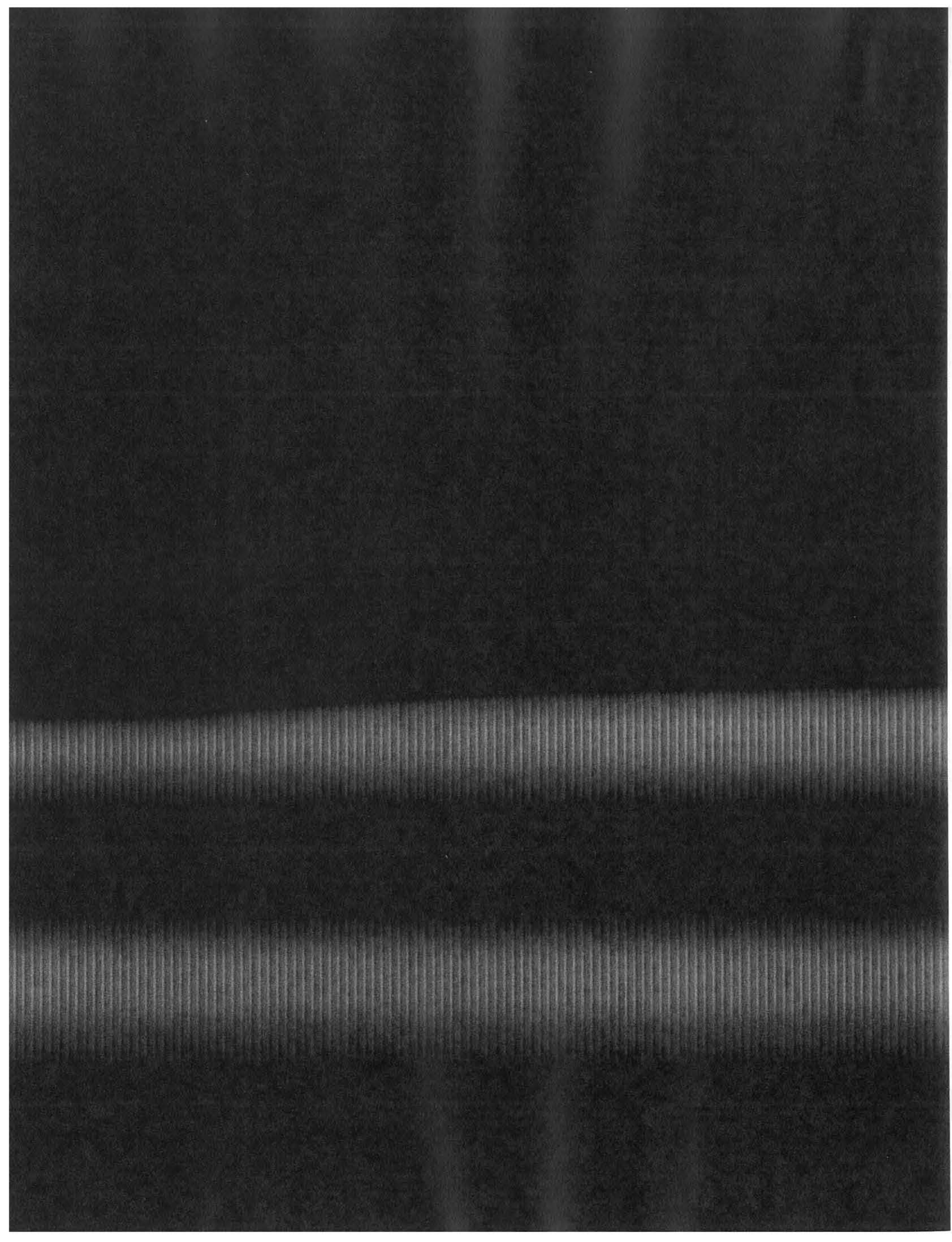
re-formed, often on top of previous reefs. Recently, human impacts from overfishing, vessel damage, pollution, land use changes and others have been added to the natural stresses that reefs must endure. The effects of and remedies for some human activities such as overfishing or dredging are clear. However, coral scientists around the world have witnessed an alarming loss of corals from disease and other unknown factors. Disease is naturally present at low levels in any species but can become epidemic when organisms are stressed.

years old, die within days. Other diseases caused by bacteria or fungi are also stimulated by higher water temperatures and some disease outbreaks have resulted in extensive coral mortality.

In spite of their relatively primitive structure and global importance, we still have large gaps in our knowledge of basic coral physiology and know even less about how they respond to environmental stress. Part of this is due to very modest funding for coral research, long considered somewhat of a biological novelty. However, the rapid decline in coral and reef condition over the past two decades is now being recognized as an indicator of environmental stress over a range of scales from local to global.

For more information about PIMS research on corals and coral “culturing”, see “Coral Gardens at Lee Stocking Island” on Page 5.

Support PIMS in our research in coral reef ecosystems—Page 7





At this time we reflect on progress to be made in the New Year as well as reflect on the past year's accomplishments. We all make our contributions in various ways as ocean enthusiasts and it takes a strong community effort to recognize the need and then do what we can to support the efforts that better protect the ocean environment and its natural resources.

We eagerly expect 2005 will be another year for focusing on our oceans because of recent policy attention being given to it. The last officially recognized "international year of the ocean" was in 1998, which was preceded in 1997 as the "international year of the coral reef." Recently the U.S. Commission on Ocean Policy finalized their assessment and defined more than 200 recommendations for a better national policy for oceans and determined actions needed in order to better manage and protect marine resources. Progress is being made already as a presidential cabinet-level committee is being formed and coordinated by the White House Council of Environmental Quality to address some of the suggested policy changes. We have a strong fidelity to the Commission and their resulting advice, as our founder, John H. Perry, Jr., served on the original Commission from 1967 - 69 and amongst many recommendations called for the creation of the National Oceanic and Atmospheric Administration.

In the midst of the new Commission's recommendations and ocean-related priorities there is a clearly defined need to deal with depleted fish stocks and protect coral reefs. At the PIMS, we have placed our priorities over the last several years on scientific studies to address resource management needs to improve fisheries stocks and protect coral reefs and associated coastal habitats. We will continue this work towards scientific advancements and look to bridge the gap between research and the education and promote greater awareness in the public.

I hope that in reading this issue you take note of the fine work being done at the Perry Institute to address certain issues that can lead to a sustainable and brighter future for the ecology of species living in the oceans. Featured prominently in our work is that of coral reef research conducted at Lee Stocking Island. We sincerely appreciate the great support that you give and our partnerships that have been formed over the years. Best wishes for a healthy & happy new year,

John Marr, Ph.D.

Meet the staff...

Ruth Ann Gonzalez, Human Resources Administrator

Ruth Ann joined the Perry Institute in May of 2004 to serve as human resources administrator. She joins the Perry Institute with over 20 years of human resources experience, including prior not-for-profit experience as the director of human resources for The Children's Place at Home Safe, Inc. Previously she served as a member of the opening team in the position of director of training and development at the Ritz-Carlton Lodge, Reynolds Plantation. She was also the assistant director of human resources at the Ritz-Carlton, Palm Beach.

In her new position, Ruth Ann will be responsible for overall human resource functions, including recruiting, retention, staff training and development and administration of employee benefits and records.

We have already seen some great improvements in our human resources function and look forward to the many contributions Ruth Ann will provide in the future.



Mission

To improve and enhance the understanding of the wider Caribbean region's marine environment by supporting and conducting high quality marine research and education programs in order to *provide solutions for people and our oceans.*

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FOR MARINE SCIENCE



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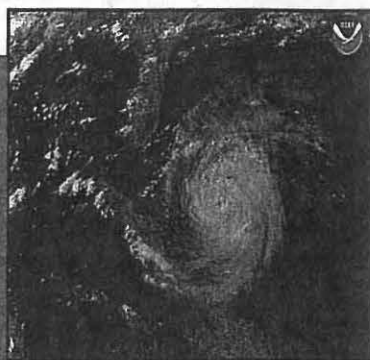
U.S. Virgin Islands Staff

David Ward—Research Associate

Washington, D.C. Staff

Amie Bräutigam—Director, Threatened Marine Species Program & Executive Officer, SSC Marine Program

Hurricanes Frances and Jeanne affected Lee Stocking Island, but only minor damage was sustained and all visitors and personnel were safely evacuated. Both hurricanes also affected our office in Florida where we were without power several days.



CATHERINE BOOKER

2004 PIMS Fall Science Intern

To begin, I will say that I thoroughly enjoyed my internship with the Perry Institute! It was exactly the kind of experience I needed to help me decide where I am headed next in the marine science world. The facilities, the natural environment, and the staff far exceeded my expectations, but the real advantage was in the opportunity to assist a variety of scientists on a variety of projects and really get a feel for what it is like to work in the field. On Lee Stocking and in the beautiful waters surrounding the island I gained knowledge and skills that could never be taught in a traditional classroom.

I began my internship with my primary interest being in fisheries ecology and conservation, so I was very excited to get the chance to help out Dr. Craig Dahlgren with both his research in the Exuma Cays Land and Sea Park looking at the "spillover effect" of marine reserves as well as with his research examining the habitat preferences of the commercially-valuable spiny lobster. Though I only participated in a small part of these much bigger projects, I got a good introduction to how such large scale studies are designed and carried out in the field.

In addition to my exposure to fisheries research, I was also enlightened to the world of corals by talking with and helping several of the scientists working on the reefs around Lee Stocking Island. I assisted with two projects in particular that differed in priority and scale, but that both taught me a lot about the various methods and techniques used in coral reef research. I now have a much greater appreciation for these habitat-

creating organisms and the dire need to protect them.

Overall, my internship with the Perry Institute was time well spent. I would recommend this program to anyone who is interested in a well-rounded, eye-opening, perspective into the fields of marine science. I wish I could've stayed longer!



Palm Beach Maritime Academy

By Jocelyn O'Neill

Recently, the Palm students to participate in Beach Maritime Academy current and ongoing and the Perry Institute for research for PIMS. Palm Marine Science have begun Beach Atlantic University working together to and Florida Atlantic develop marine education University have also programs at Peanut Island expressed an interest in (West Palm Beach, FL). having a more central

There are many areas location for a laboratory/ where the Perry Institute field station in Palm Beach for Marine Science (PIMS) County for their students and the Palm Beach to participate and conduct Maritime Academy research.

Potential projects include an environmental monitoring project and PBMA has available for developing a lobster use the Coast Guard project similar to one at buildings on Peanut Island Lee Stocking Island, to be which are underutilized at used for educational the present time. The purposes. In addition, the Education Advisory local university students Committee for PIMS may be able to use the recently developed facilities to assist them with field research and curricula for use at the provide valuable field research facility on Lee experience. Stocking Island (LSI), and this same curricula could be adapted for use at the PBMA facility. In addition, there may be opportunities for educational programs to take place in a research environment allowing



Staggering Statistics—Coral Peril

Source: Washington Post 12/12/04 Page B06

Twenty percent of the world's coral reefs "have been effectively destroyed and show no immediate prospect of recovery." An additional 24% "are under imminent risk of collapse through human pressures," and an additional 26% "are under longer term threat of collapse." These statistics are reported by the Global Coral Reef Monitoring Network. Australian and Pacific corals remain relatively healthy but not so for Caribbean corals where coral cover has declined up to 80% on some reefs. Studies show that people are using the ocean's resources in a way that cannot be sustained. You can help by supporting the Perry Institute's research on coral health and conservation. Page 7.

Research

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RESEARCH HIGHLIGHTS - FALL 2004

Bahamas Biocomplexity Project (AMNH) - Brumbaugh

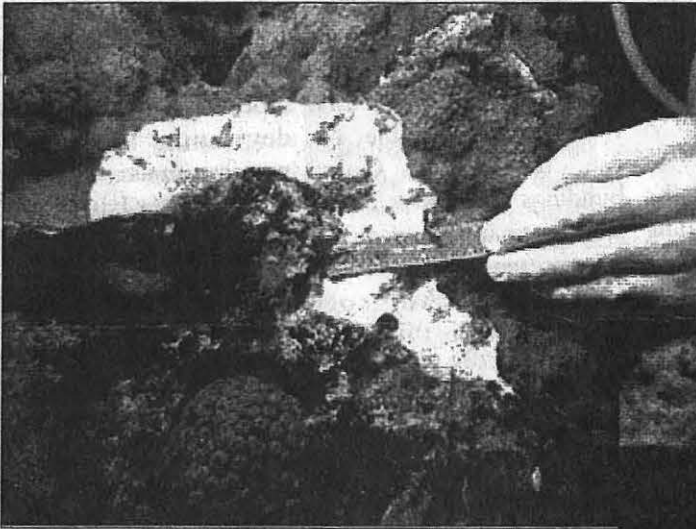
This project is characterizing and comparing the fish and bottom communities of several different habitat types in both protected (Exuma Cays Land and Sea Park) and unprotected areas of the Exuma Cays, examining the ecological similarities and differences in these areas. Parts of this research were filmed by an ANMH film crew for inclusion in an upcoming documentary. More information at <http://bbp.amnh.org>.

"Temporal variation in a Bahamian patch reef community: Rainbow Gardens Reef 1991 - 2004" - Dustan (College of Charleston)

Using photo and video transects, this project re-surveys the coral cover in areas of Rainbow Gardens Reef which were last surveyed in 1991, allowing for a direct measure of the changes to the reef that have occurred over the last decade.

Comparison of bacterial communities among geographically separated corals infected with white plague type II - Jonas (George Mason U.)

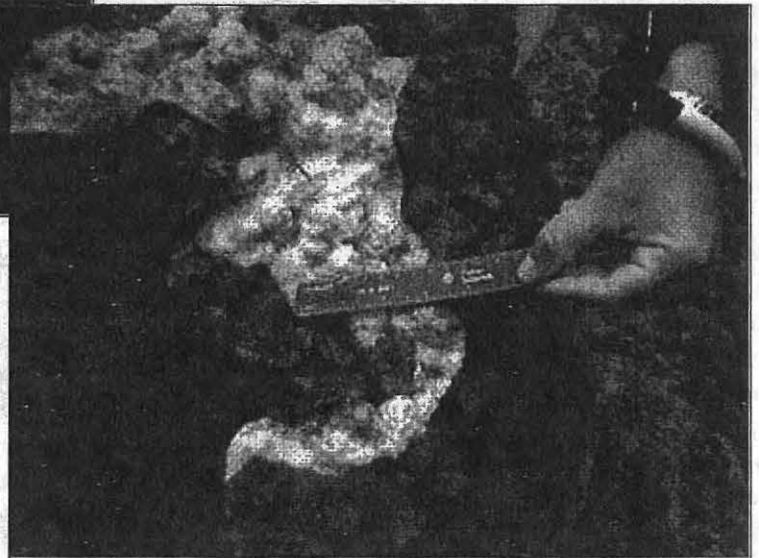
This study is an analysis of the types of bacteria associated with white plague (Type II) coral disease, as found in some of the hard reef-building corals common to the Bahamas and other parts of the Caribbean. This project also compares the incidence of the disease in various parts of the Caribbean, and will use repeat visits to monitor the spread of the disease over time.



JONAS—White plague on *Montastrea faviolata* on Andros Barrier Reef (July 29, 2002). Pin marks edge of disease line.

Molecular ecology of the scleractinian coral *Siderastrea siderea*—Olson (U. of Alabama)

This project examines the molecular and microbial ecology of the massive starlet coral (*S. siderea*) and other common hard corals. Research on these corals will include workups on genetics, symbiotic algae, microbial pathogens, and antimicrobial compounds for each species.



JONAS—Progression of white plague disease as of Aug. 06, 2002 on *M. faviolata* colony shown in previous photograph.

Mechanisms of steroid action in scleractinian corals—Tarrant (Woods Hole Oceanographic Institution)

This project is studying the function of steroid compounds in the growth and physiology of some of the common hard corals in the Lee Stocking Island area. These types of corals are the dominant reef building corals in the region.

For more information about our research, visit our website at www.perryinstitute.org

The Coral Gardens at Lee Stocking Island

By Erich Mueller, Senior Research Scientist

PIMS Senior Research Scientist Dr. Erich Mueller has been working with corals at Lee Stocking since the late 1990's. Dr. Mueller believes that there is one factor that has limited progress in understanding coral biology and health. Typically, coral scientists have conducted experiments on the reef or collected fresh specimens for laboratory experiments. Such approaches are valid for asking certain questions but introduce too much variability to

fully understand basic processes underlying coral physiology. In the biomedical sciences, great strides have been made using "standard models." These are organisms selected for specific reasons and propagated under controlled conditions to minimize genetic and environmental variation. Scientists working with guinea pigs do not make collection trips to the Andes for their subjects; they order certain genetic strains raised under standard conditions as needed. For example, strains of various animals have been identified that are susceptible or resistant to

specific diseases. Each serves a purpose for investigating those diseases. The "Coral Gardens" at LSI are designed to provide similar tools for visiting scientists by culturing model coral species under standardized conditions.

A CMRC Program Development Grant to Dr. Mueller in 1997 demonstrated the feasibility of coral culture at LSI. After establishing culture facilities at Mote Marine Laboratory's Center for Tropical Research in the Florida Keys, Dr. Mueller began a long-term coral culture program on LSI in August, 2003. Experiments were conducted to optimize growth conditions and, by the summer of 2004, propagated corals were ready. Dr. Chris Langdon (Univ. of Miami) was the first visiting scientist to use them as he examined the effects of elevated CO₂ on coral growth rates.

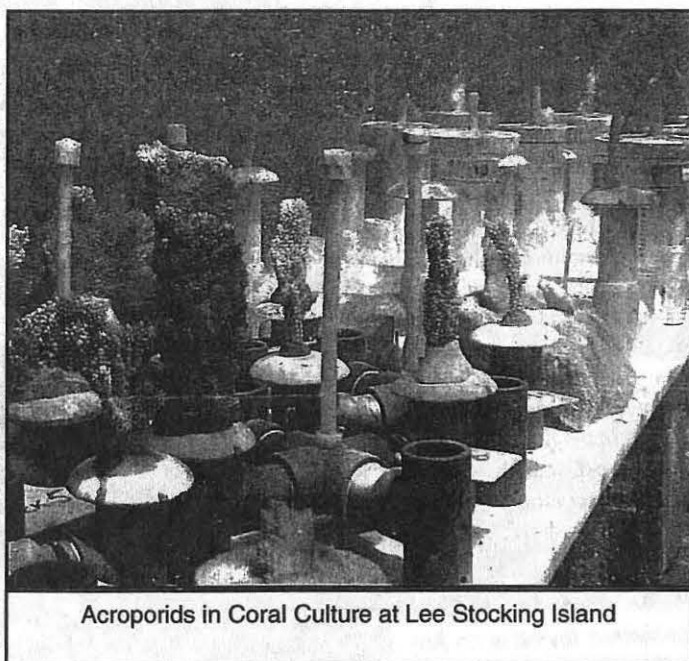
Several model species have been selected to meet a variety of research questions. The staghorn coral (*Acropora cervicornis*) is a fast-growing, branching coral which has already been the focus of many studies. Along with its cousins, the elkhorn coral (*A. palmata*) and the

fused staghorn coral (*A. prolifera*, thought to be a hybrid of the other two), the staghorn coral is being considered as the first marine invertebrate to be listed as an Endangered Species. The staghorn and elkhorn corals have been two of the most important reef-building coral species in the Greater Caribbean but have suffered some of the most dramatic declines over the past 20 years. The mounding star coral (*Montastrea faveolata*) is slow growing and a major

reef builder. The last coral species currently in culture at LSI is the mustard hill coral (*Porites astreoides*). It is one of the most common mounding corals and appears to be very tolerant of temperature stress which may help answer questions about why others are not. It was also selected for two other reasons: 1) it produces larvae over a several month period (most corals reproduce only a few days of the year) which will facilitate experiments on this early life stage of corals and 2) it has potential for use as human bone implants.

Multiple "parent" colonies of each species were located at numerous reefs in the LSI area. The colonies were collected entirely or by removing fragments and placed in one of two large seawater tanks on the island. Genetic strains of progeny are then created from each coral through cuttings or fragments, much like in plant propagation. Scientists can focus on one strain or use multiple strains of a given species so that results do not reflect unusual individuals.

Efforts are underway to secure long-term support for the LSI Coral Gardens so that scientists can continue work with the same genetic strains and reliably repeat experiments as needed. Additional species will be brought into culture as needs arise. And over time, a body of knowledge about each genetic strain of each species will emerge to support new studies. This rigorous approach, standard in biomedicine, will help us attain the more sophisticated understanding of coral biology necessary to address issues regarding their health. On your next visit to LSI, ask to see the Coral Gardens; you don't even have to get wet!



Acroporids in Coral Culture at Lee Stocking Island

IUCN World Conservation Congress in Bangkok

By Amie Bräutigam
Threatened Marine Species Director

PIMS Threatened Marine Species Director Amie Bräutigam and Board Chairman Roger McManus (on behalf of Conservation International) traveled to Bangkok, Thailand in mid-November to participate in a series of meetings convened as part of the quadrennial IUCN World Conservation Congress, the largest nature conservation gathering in the world. Joining them were over 5,000 representatives of governments, government agencies, and non-government organizations; the private sector and the press; and the gracious Thai government hosts. The PIMS-sponsored *Extinction in the Sea* exhibit also traveled to Bangkok, where it was displayed along with exhibits from numerous other organizations in the Queen Sirikit national convention center.

The Species Survival Commission (SSC) met during the first two days of the ten-day Congress to discuss and deliberate over many issues, including developments with the *IUCN Red List of Threatened Species™*, the most comprehensive, authoritative global list of threatened species that is compiled largely by the SSC. In this context, Roger McManus introduced plans for a Global Marine Species Assessment, aimed at greatly expanding the IUCN Red List process for marine species, which are currently under-represented on the list. The launch of the 2004 IUCN Red List at the meeting generated extensive international press coverage.

Following the commission meetings was the three-day World Conservation Forum, which featured several hundred discussion sessions on a wide range of issues, such as managing the live reef food fish trade, conservation of the whale shark, mitigating

marine turtle bycatch in longline fisheries, assessing the effectiveness of marine protected management, and protection of marine biodiversity on the high seas. The highlight for PIMS in our collaboration with SSC was an expert panel discussion chaired by Amie Bräutigam on *Extinction in the Sea: Leveraging Emerging Science to Transform Marine Conservation*. In addition to Amie and Roger, this session included SSC experts Sarah Fowler (Shark Specialist Group), Terry Donaldson (Coral Reef Fishes Specialist Group), Nick Dulvy (Shark Specialist Group) and Jack Sobel of The Ocean Conservancy. Although it started at 9:30pm, it was relatively well-attended, and the several questions raised after the panel presentations demonstrated the degree of interest in this issue as well as the need for greater, broader dissemination of results of the scientific work that is going on, a need that we expect to fill with a publication currently in progress and scheduled for completion in the first quarter of next year.



Amie Bräutigam and Roger McManus in front of the exhibit in Bangkok.



Above: Mr. and Mrs. John H. Perry, Jr.

Right: Ms. Leslie Dale (Board Member) and guest

Below: Mr. Roger McManus (Board Member and Chairman) and guest



"Hanging in the Balance" Fundraising Event

On November 3, 2004 over 60 supporters of the Perry Institute for Marine Science gathered at the Maltz Theatre in Jupiter, FL to watch the premier of the "Hanging in the Balance: The Future of Fisheries in the Bahamas" film. The film documents the past and current status of Bahamas fisheries through the eyes of the fisherman and local government officials. It is a striking story of hope in the struggle to save our oceans.

Over \$6,300 was raised at the event through a Silent Auction, Raffle, Event Sponsors, and general donations to support the work of the Perry Institute for Marine Science. We would like to thank all of our supporters, those in attendance and those unable to attend. We hope you will be able to join us for our next event in 2005. A special thank you to Tara Ford and Leslie Dale for helping to organize the event. Also thank you to Anna Marr and other PIMS volunteers for their extraordinary contributions and efforts for this event.

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Please consider pledging your support for the Perry Institute for Marine Science so that our programs can continue to grow as we work toward providing solutions for people and our oceans.

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WELCOME TO OUR NEW ISLAND MANAGER AND DIVING SAFETY OFFICER!

Scott Schoenleben Island Manager

Scott Schoenleben brings more than 24 years of experience in project management and administration both domestically and off-shore to his new position. He is responsible for the overall operation of the Perry Institute's facilities and personnel at the marine laboratory on Lee Stocking Island. Among the facilities are wet and dry laboratories, a diving locker, and housing and dining facilities for up to 40 visitors and staff members. Schoenleben is also responsible for logistics and all administrative functions of the facility.

Prior to joining the Perry Institute for Marine Science, Schoenleben served as plant manager for National Linen Service, running the company's Nashville business unit where he was able to increase productivity by 35 percent. He also

served as general manager of Oshkosh B'Gosh's Millennia manufacturing division and held several other positions with the company from 1988 to 2000.

Scott's first order of business upon arrival at Lee Stocking Island was recovery from H. Frances and preparations for H. Jeanne. Job well done, Scott!



Michael Lombardi Diving Safety Officer

Michael Lombardi has been the interim DSO on several occasions for PIMS since 1999, which contributes to a heightened familiarity with current procedures for our organization, as well as with AAUS and NOAA standards and procedures on a broader spectrum.

Michael has been working as a freelance professional diver since 1998. He has a degree in Marine Biology from the University of New Hampshire and has gained extensive experience as both a commercial and scientific diver, being proficient with digital and film underwater photography and videography for scientific applications, various survey/sampling techniques, instrument deployment, heavy construction and salvage, u/w steel fabrication, explosives, demolition, surveys, bridge and pier inspection, search and recovery, vessel body surveys, and mooring installation and maintenance. Michael is a published scientist and photojournalist, whose work has been associated with the University of Mississippi, the Perry Institute for Marine Science and the Antarctica New Zealand Program to name a few.

