International Year of the Reef

SMS Research and Education Support Worldwide Efforts
Laura Diederick, Education Specialist

Many people may be unaware that 2008 has been designated the International Year of the Reef. Others may simply wonder, “What do coral reefs have to do with me?” The simple answer to that question is “Everything.”

Coral reef ecosystems are often hailed as the “rainforests of the seas.” Given that the plight of rainforest degradation has been on the radar of most Americans for much longer than that of coral reefs, this is a welcome metaphor. Yet humankind has been drawing from, and thus examining, the resources of terrestrial ecosystems such as rainforests for many more years than we’ve had the ability to fully explore the marine environment. By comparison, we are decades, perhaps even centuries, behind in researching the underwater world. Since the advent of SCUBA technology in the 1950s, scientists have been exploring coral reefs and other previously inaccessible underwater ecosystems. Most researchers would agree that our oceans are our “final frontier.”

So what resources do reefs have to offer? Aside from supporting a multi-billion dollar, worldwide tourism industry, coral reefs are fertile breeding grounds for many organisms, provide food and shelter for many recreationally and commercially important species, and create a natural barrier (hence reducing erosion and protecting coastlines) against waves and storm surge. Additionally, within the past few decades researchers have recognized the potential for deriving medicinal compounds from organisms found on reefs.

Investigations of the dynamics of coral reef ecosystems have been a component of the research efforts of SMS for many years. One on going study is that of SMS Director Dr. Valerie Paul and SMS Research Technician Raphael Ritson-Williams, who are conducting experiments to determine factors that may influence whether or not coral larvae settle and develop on a given surface. As the percent of coral cover across the Caribbean continues to decline, the establishment of new colonies is one vital component to restoring reef health. Determining compounds that larvae try to avoid, or conversely substrates which they prefer, may lead to better management practices.

The increasing presence of algae and cyanobacteria on coral reefs is another concern worldwide. Both are able to utilize any available nutrients and quickly overgrow large tracts of previously healthy reefs. SMS Postdoctoral fellow Kate Semon is investigating what enables cyanobacteria to bloom so prolifically and how such blooms contribute to shifts from a reef dominated by corals to one dominated by algae.

Disease is also a “hot topic” in coral reef health, due in part to the number of unknowns surrounding the causes. Connections have been made to water temperature and nutrient levels, and plenty of fingers have pointed at bacteria. Yet almost nothing is known about the bacterial communities maintained by healthy corals. Without a baseline to reference, it is difficult to determine what roles microbes play in coral disease, or how environmental conditions may influence these roles. SMS Postdoctoral fellow Koty Sharp has been investigating how and when several species of Caribbean corals acquire bacteria, thus creating a framework for future comparative studies. SMS
James Smithson, the Smithsonian Institution’s benefactor, recognized the importance not only of conducting research, but also of sharing it with the broader community. A recent collaboration between researchers and educators at SMS and Mote Marine Laboratory in Sarasota perfectly illustrates Smithson’s desire for “the increase and diffusion of knowledge.”

Supported by a grant from the Mote Marine Laboratory Protect Our Reefs program, SMS Postdoctoral Fellow, Koty Sharp, and Education Specialist, Laura Diederick, developed and facilitated two free teacher workshops for middle school teachers, entitled “Coral Reefs: Bacterial Worlds.” One workshop was held in January at SMS and a second was offered in February at the Mote Marine Lab in Sarasota.

The goal of the workshops was to provide participants with the skills and background information to teach broad ecological concepts, such as symbiosis and evolution, as well as introduce current science technology, using microbial communities on coral reefs as a framework.

Despite packing several days worth of information into the seven hour course, participants only wanted more. “I wish we had more time or multiple days,” said one participant. “It was so interesting.”

And aside from all the hands-on fun participants had, they especially appreciated learning of current research. “The course was very informative. I enjoyed hearing about the research that is now taking place concerning microbial populations on corals.”

Although no new dates for the workshop have been set, the positive responses have ensured that it won’t be long before one is scheduled. In the meantime, visit the website at www.sms.si.edu/SME for upcoming events.

Dr. Mary Hagedorn of the Smithsonian National Zoo delivered a presentation titled “Global Warming and Coral Reefs: Hot Topics, Cool Solutions” at the Pelican Yacht Club in February. Pictured here are Dr. Clay Cook (Harbor Branch), Peter and Jeanne Tyson, Dr. Valerie Paul (SMS) and Dr. Hagedorn.

In March, Dr. D. Wayne Coats, a senior scientist at the Smithsonian Environmental Research Center in Maryland shared extraordinary footage of microalgae during his presentation, “Microbial Aliens vs. Predators: Do Monsters Exist in the Plankton?” Dr. Coats (left) is seen here with Dr. Mary Rice (SMS) and a guest at the lecture.

SMS Welcomes Friends New and Old

Many thanks for the ongoing support of the Friends of SMS. If you would like to learn more about becoming a Friend, please contact Joan Kaminski at 772.462.0977.

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Local Student Receives International Recognition

Jim Fichtelman, a senior at Vero Beach High School, received multiple awards and recognition on the local, national and international levels for his investigation of the effects of UV light on flatworms of various pigmentation. Jim took advantage of the microscopy and photography equipment available at SMS and, as a result, produced the high caliber of documentation that led to his successful project. Congratulations to Jim and all the young scientists supported by SMS!

New Arrivals at SMS

Kate Rawlinson joined SMS as a Postdoctoral Fellow in September 2007. Kate studies the development of flatworms, comparing different life-stages to look for clues as to how they evolved.

Valerie Paul received an award of $40,000 from St. Johns River Water Management District for the project “The Indian River Lagoon Inventory: Critical Habitats and Associated Species”.

Valerie Paul received an award of $19,370 from the U. S. Geological Survey (subcontract from University of Central Florida) for the project “Coral-Algal-Herbivore Interactions in Protected Versus Unprotected Reef Ecosystems”.

Valerie Paul received an award of $13,500 from the Link Foundation for support of “Marine Science Student Fellowships (2008-2009).”

Selected Publications


Gonzales, Eric E., Maurijn van der Zee, Wim J.A.G. Dictus, and Jo van den Biggelaar. 2007. Brefeldin A or monensin inhibits the 3D organizer in gastropod, polyplacophoran, and scaphopod molluscs. Development, Genes, and Evolution, 217: 105-118.

Harding, Juliana M. and M. G. Harasewych. 2007. Two new modern records of the southern oyster drill Stramonita haemastoma floridana (Conrad, 1837) in Chesapeake Bay, USA. The Nautilus, 121(3): 146-158.


Summer is fast approaching! These enthusiastic SMEE Spring Breakers took to the streets - well, the sidewalks, at least! - to spread the word about 2008 being designated the International Year of the Reef. If you and your family are looking for ways to join in on the celebration, check out our summer program schedule!

June
World Ocean Day Celebration | June 7, 2008
Come celebrate the wonders of our blue planet! [10:00 AM - 3:00 PM | FREE with paid admission | All ages]

Ocean Discovery Camp | June 16-20, 2008
[9:00 AM - 12:00 PM | $85 | Ages 6-8]

Research Station Guided Tour | June 19, 2008
[2:00 - 3:00 PM | FREE | Suggested ages: 16 and up]

Ocean Adventures Camp | June 23-27, 2008
[9:00 AM - 3:00 PM | $125 | Ages 9-12]

July
Ocean Explorers Camp | July 14-19, 2008
[9:00 AM - 3:00 PM | $145 | Ages 13-15]

August
Families in the Field - Seagrasses | August 9, 2008
[8:30 - 10:00 AM | $6 | Ages 6 and up]

Research Station Guided Tour | August 21, 2008
[2:00 - 3:00 PM | FREE | Suggested ages: 16 and up]

Visit our website at www.sms.si.edu/smeecalendar.htm for full details, or call the Education staff at 772.465.3271.

Selected Publications (continued)

