



Northeastern University

Marine Science Center Newsletters

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April 01, 2008

The Rising Tide: Spring 2008

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Recommended Citation

Marine Science Center, "The Rising Tide: Spring 2008" (2008). *Marine Science Center Newsletters*. Paper 6. <http://hdl.handle.net/2047/d20000072>

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Students Explore Seastar Outbreak in French Polynesia

An Update from the Three Seas Program

Each January, students of the Three Seas Program head to the island of Moorea in French Polynesia. This tropical paradise plays host to UC Berkeley's Gump Field Station – a lab within walking (and swimming) distance of a lagoon system and perennial freshwater streams. What's more, the lab offers students access to the sprawling coral reef that encircles the island.

This year marks the 24th session of the Three Seas Program. The students have made the most of their winter semester – snorkeling and exploring the bay in their free time, and steadily preparing for their impending final exam and research paper in Coral Reef Ecology. In this class, under the guidance of Program Director Sal Genovese and instructor Bill Precht, students have had the opportunity to investigate the current outbreak of the corallivorous "Crown-of-Thorns" Seastar at two forereef sites on the north shore of Moorea.

In addition to documenting its density and size distribution, students assessed this seastar's effect on the reef by conducting an analysis of the coral cover. From the perspective of Professor Genovese, this on-site research opportunity is invaluable to students. "Reading about Crown-of-Thorns outbreaks is one thing," commented Genovese, "but seeing firsthand the devastation this predator can wreak upon coral reefs is an amazing experience."

Supplementing their research in the water, the students have enjoyed time on terra firma, as well. The only non-marine course in the program, the Tropical Terrestrial Ecology class taught by Dan Bisaccio, functions as the academic midpoint of their time in Moorea, and for the program as a whole. During this "dry" week, students began to set their sights on the final segment of the program – the spring semester at University of Southern California's Marine Science Center on Catalina Island, CA.



Students of EW XXIV along with Tropical Terrestrial Ecology instructor Dan Bisaccio (2nd from R) and Three Seas Program Director Sal Genovese (2nd from L), enroute to field site in the Papenoo River Valley, Tahiti.



Fighting White Band Disease

Professor Steven Vollmer's Lab Partners with the Coral Restoration Foundation

At the Vollmer Lab, we use genomic techniques to answer questions about the evolution and ecology of marine organisms. We have ongoing projects that range from identifying disease-causing bacteria on corals to examining the evolutionary histories of seaweeds, snails and a variety of other organisms.

Currently, we are focused on researching host-disease resistance in the two dominant shallow-water corals in the Caribbean – the staghorn and elkhorn corals – to White Band Disease (WBD). This disease has caused an unprecedented Caribbean-wide decimation of these corals and spurred their listing on the US Endangered Species Act.

Over the past two years, significant inroads have been made towards identifying the WBD pathogen, understanding the factors controlling outbreaks of the disease, and most importantly, identifying naturally resistant strains of staghorn coral. We now know that up to 6% of staghorn corals are resistant to WBD.

This natural disease resistance is critically important because it shows that these corals have the potential to recover from the disease, especially if reefs are replanted with resistant corals. As part of this effort, we are identifying which genes confer disease resistance, which will aid in the identification of resistant corals. We have partnered with the non-profit Coral Restoration Foundation to develop scientifically informed coral farming practices. Look for this work to make a big splash in the next year.



Message from the Director



The Marine Science Center has been buzzing with activity during the winter months. Electricians, plumbers, painters and carpenters have been refurbishing the facilities and constructing the Bracken Research Lab – making the Center an even better place in which to study, work and conduct research. As an example, to ensure proper flow of seawater through the facility, John McDonough launched a mapping project of our outflow systems. Many of the systems have historical value: remnants from the hotel, local estates, WWII bunkers, Cold War buildings and the recent addition of the MSC. It was a bit like an archeological exploration in Rome.

As always, our research activities have led us to exciting places. Geoff Trussell and his students studied along the cold waters of coastal Maine, while on the warmer side, Steve Vollmer conducted research in Panama. Both Slava Epstein and Sal Genovese worked in Venezuela. Joe Ayers interacted with robotics collaborators from New England to Florida, and is currently starting a project on jellyfish in the Murphy Bunker. Phycologist Don Cheney, a long time MSC faculty member, is preparing to move his lab from Boston to Nahant. We look forward to having his lab join us on a full-time basis. Matt Bracken's research has been featured in the "Editors' Choice" section of the renowned journal *Science*. The continued development of the Jones lab (NUCVS) is aided by the efforts of Co-op Work Study Natalia Agudelo. In 2007, the holdings and displays drew 466 researchers, students, and visitors to the facility, including Cub and Girl Scout groups from Nahant and Swampscott, middle school students from Salem and South Korea, and high school students from Lexington and Cambridge.

S.W.I.M. (Nahant's Safer Waters in Massachusetts) continues to meet monthly at the Center. We value this relationship a great deal, as it has proven to be a productive forum for the exchange of ideas. In fact, it was through this organization that the idea for an eelgrass survey arose. It is the intent of MSC's Outreach Program to initiate a long-term survey of Nahant's eelgrass beds to document the population dynamics of this plant. Nahant's eelgrass population has been healthy enough to serve as a source for transplantation to several Boston Harbor islands. This project enables us to better understand the species, while at the same time teaching methods of study and conservation.

GWILYM S. JONES, Ph.D., *Director*

Welcome Nicole MacRae

Nicole MacRae is the Marine Science Center's newest staff member, who joined the Outreach Program as Assistant in December. Nicole will have a hand in all aspects of the Outreach Program: leading K-12 field trips, developing new programs, teaching our summer science academies, and ensuring the Outreach Program continues to grow and advance.



Nicole MacRae, *Outreach Program Assistant*

Outreach on the Move

As summer approaches – with the promise of sun-warmed tide pools and bright, sandy beaches – many school groups are excitedly making arrangements to visit our Center. Our calendar is rapidly filling-up; thankfully, our Outreach staff has expanded, and they are preparing as a team for the busy seasons ahead. With the help of capable new assistant Nicole MacRae, Tracy Hajduk has diligently innovated new programs and increased our collaborations with various schools and organizations.

Currently, the Outreach Program is accepting applications for its two-week *August Coastal Ocean Science Academy* (COSA). Students who are entering the 9th or 10th grade in the fall of 2008 are invited to apply. During the program, we introduce the students to marine science and acquaint them with the ongoing research that occurs at the Marine Science Center and in other local ecosystems.

Cathy Roney, our newest Co-op student, is quickly learning the ropes and becoming an active member of the outreach team. With her time split between Dr. Vollmer's genetics lab and the Outreach Program, Cathy is simultaneously gaining experience in research, education, and outreach.

The Evening Lecture Series has continued to bring in standing-room-only crowds. The April lecture – the last for this the academic year – will be held at Nahant's Town Hall. Professor William Fowler, of Northeastern University, will be presenting a history of the North Atlantic fishery. The town of Nahant was generous to offer the space for a lecture that promises to draw a large crowd. Other lecture topics in 2008 have included shell disease in lobsters, consequences of biodiversity loss, and sustainable fish harvesting in the Amazon.



Cathy Roney, the *Outreach co-op* collecting organisms on *Canoe Beach*

About the Marine Science Center

The missions of the Marine Science Center are Research, Education, and Outreach

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