

MARINE TECHNOLOGY & LIFE SCIENCES SEAWATER COMPLEX



UNIVERSITY OF MIAMI

ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



COASTAL CONSIDERATIONS

As more people and societal infrastructure concentrate along coastal areas, humans are becoming more vulnerable to the impact of tropical cyclones (hurricanes).

Currently, about 60 percent of people worldwide live in a coastal region, and just in the United States this number is expected to jump to 75 percent by 2025.

Crisis managers and emergency planners who are tasked with relocating coastal populations from the path of destructive weather require increasingly accurate prediction skills – most notably in understanding hurricane intensity and rapid intensification. A better understanding of building structures exposed to wind, wave, and surge forces is also important in designing and erecting safer structures that are more wind- and water-resistant.

WORLD CLASS FACILITY FOR HURRICANE SCIENCE

A one-of-a-kind SUSTAIN (SURge-STructure-Atmosphere INteraction) research facility will be a major component of this complex. This will be the only place in the world with a wind-wave-storm surge simulator capable of generating Category 4 hurricane-force winds in a 3D test environment.

Designed by the world's leading aquarium architects, the new seawater tank will provide scientists and engineers with access to critical observations within a realistic, but scaled and controlled environment. SUSTAIN will enable the development and testing of building envelopes to protect critical structures during hazardous conditions, and will also be used to innovate advanced sensor technologies, including remote and optical imaging systems that can be deployed in hurricanes.



LIFE-CHANGING SCIENCE



Few facilities exist in the world where biomedical research is being conducted on such a wide range of aquatic organisms. The Marine Life Sciences Center, located within the new saltwater complex will provide a dedicated space for the study of these animals, underscoring the critical connections between oceans and human health.



Aquatic organisms provide a range of naturally occurring disease processes that can be extremely useful as models of human disease.

One example is peripheral nerve sheath tumors in bicolor damselfish. These tumors resemble neurofibromas in humans, so investigators at the new facility can use this system as a model to study the pathogenesis of this specific cancer.

The new complex will be a hub for research in marine genomics and toxicology. Equipped with the latest DNA technologies, scientists will conduct studies on population connectivity and other areas critical to marine conservation using the most advanced genetic techniques. Marine organisms such as killifish will be used as models of gene expression -- something that can only be studied epidemiologically in humans.

The National Resource for Aplysia located in this facility is the only place in the world that cultures and raises *Aplysia californica*. The relatively simple neurological system of *Aplysia* offers an ideal model for research on neurophysiology, brain function, memory and learning, and aging. Funded through the National Institutes of Health for the last 15 years, the programs ships more than 25,000 animals annually to scientists around the globe.

TROPICAL AND SUB-TROPICAL FOCUS ON OCEANS & HUMAN HEALTH

Vital links between the oceans and human health are being established every day. The joint National Science Foundation-National Institutes of Environmental Health Science-funded Oceans and Human Health Center at the University of Miami brings together medical and ocean researchers to investigate how humans affect oceans and how oceans affect humans in tropical and subtropical environments. Issues like the effects of neurotoxins on the blue crab we eat, harmful microbes on our beaches and pathogens in our drinking water after storm waters recede are all being explored.

AT A GLANCE

Building Size:

85,000 square feet

Seawater Circulating

1,000 gallons/minute

LEED Certification:

Yes

Architects:

Cambridge Seven Associates, Inc.

Target for Completion:

Summer 2013



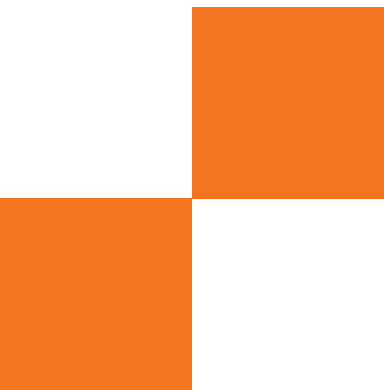
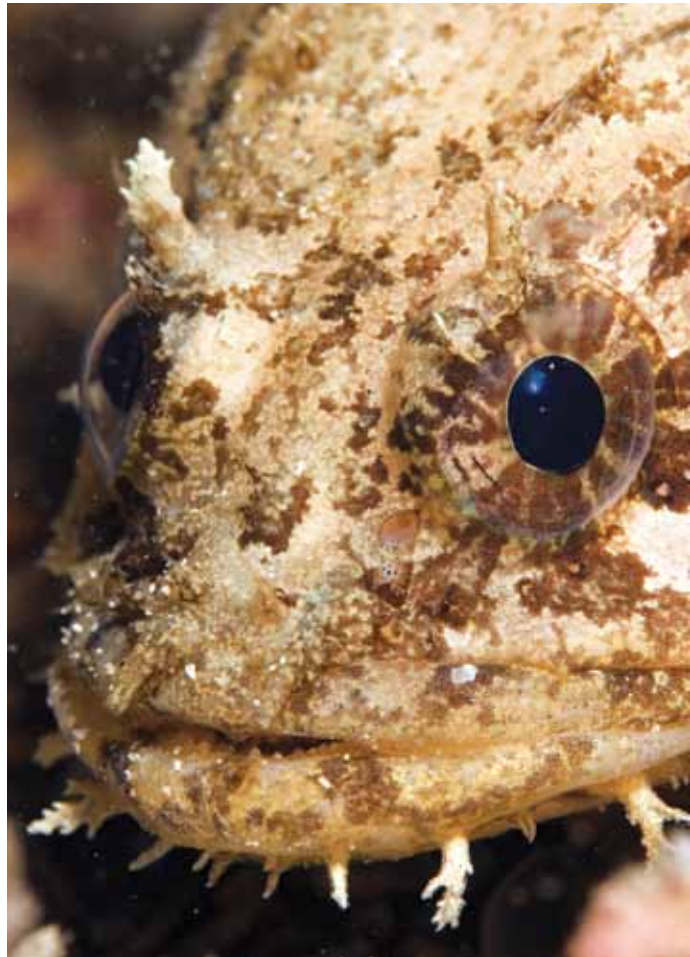
BREAKING NEW GROUND

The University of Miami (UM) Rosenstiel School of Marine & Atmospheric Science on Virginia Key in Miami-Dade County is a recognized leader in environmental research. The School's award-winning investigators conduct groundbreaking studies of the ocean and atmosphere, and help establish a solid scientific foundation for those responsible for tackling today's emerging environmental issues.

The new Marine Technology & Life Sciences Seawater Complex will permit our scientists to further unravel the mysteries of the planet and help improve quality of life for us all.

This dedicated seawater complex will be the centerpiece of an updated Rosenstiel School campus. It will offer space for two critical areas of study: air-sea interactions (including hurricanes) and marine life sciences.

In 2009, the Rosenstiel School was awarded a \$15 million grant from the National Institute of Standards and Technology (NIST). As part of the American Recovery and Reinvestment Act, the funds are designed to attract investment and jobs to South Florida, and foster the state's growing life sciences industry. The federal grant provides a portion of the \$47 million necessary to create the nation's premier dedicated seawater research building. Additional fundraising is ongoing to make the complex a reality.



COMMUNITY PARTNERSHIPS & OUTREACH

Scientists from around the globe will travel to South Florida to participate in groundbreaking collaborative research taking place within the new complex. Beyond the research, the facility will provide an opportunity for expanded outreach to the community.

Among the many activities currently underway at the Rosenstiel School:

- Integrated Marine Program and College Training (IMPACT), with the Miami Museum of Science and Miami-Dade County Public Schools (MDCPS); a six-week program for low-income, first-generation college-bound students to study oceanography, ecology, meteorology and resource management in an interactive academic setting.
- RJ Dunlap Marine Conservation Program, takes over 1,000 students into the field, advancing STEM (Science, Technology, Engineering and Math) literacy and environmental stewardship.
- Women in Science Day, with MDCPS and the American Association of University Women, 6th - 7th grade girls spend time with researchers to bring awareness to careers in industry, academia and government.
- Environmental Immersion Day, in partnership with Fairchild Tropical Garden, student groups visit the Rosenstiel campus for hands-on learning.
- National Ocean Sciences Bowl, a high school "Jeopardy-like" competition to prepare the next generation of informed citizens regarding the challenges facing our oceans.
- Sea Secrets, an annual lecture series featuring distinguished scientists and ocean explorers, free and open to the community.



For more information on the Marine Technology and Life Sciences Seawater Complex, please contact Rosemary Mann, Assistant Dean of Advancement, 305-421-4061.

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