Spotlight

Literally hundreds of university programs deserve to be recognized for their efforts toward having an impact on the University of South Florida's mission. Each issue of *Great Expectations* provides the opportunity to spotlight one of those programs. This issue highlights the College of Marine Science.

College of Marine Science

BY MARY ELLEN COLLINS

Peter Betzer's respect for his colleagues and his enthusiasm for the work they're doing hasn't diminished a bit in thirty-one years.

"It was the people who impressed me when I first came here as a young faculty member," says the Marine Science College dean, "and I'm still impressed with them today. It is absolutely thrilling to me to see our faculty, our students, and our graduates involved in things that have such a direct and important connection to what's happening in our society."

Originally founded as the USF Marine Institute in 1967, the College has become an internationally renowned center for graduate study and research. Master's and doctoral students pursue concentrations in biological, chemical, geological or physical oceanography.

Faculty expertise ranges from satellite oceanography, which involves collecting satellite data from the world's sea surface and applying it to regional ocean ecosystem models; to Antarctic oceanography, which focuses on understanding the Antarctic marine food web.

There are faculty who study global climate variations that have happened since the last glaciation and since the impact of human activities; others who examine coral reefs and the natural and human-induced diseases that affect them; and still others who study the genetics that control the function of marine bacteria and viruses and the possibility of pathological effects on marine environments that may impact humans.

Students from around the world come to the College of Marine Science, and according to Betzer, "when they graduate, they are competitive with the best people coming out of any program, anywhere."

One hallmark of the College of Marine Science research activity is the significant practical application of groundbreaking, new technologies, such as The Physical Oceanographic Real-Time System (PORTS). This system improves navigational safety and protects the environments by collecting and relaying water level, current and meteorological data to recreational boats and professional pilots navigating in Tampa Bay.

The Coastal Ocean Monitoring and Prediction System (COMPS) collects and provides data for West Florida coastal management issues such as safety and efficiency of marine navigation, search and rescue efforts, and making accurate predictions of coastal flooding caused by storm surge.

Perhaps most impressive among the College of Marine Science's achievements is the expansion of the Center for Ocean Technology (COT), which provides engineering support to the College's scientists. It has grown from 5 engineers and $2 million in research in 1995 to 71 engineers, researchers, technicians and student assistants with an annual research budget of nearly $18M.

The COT's staff has expertise in electronic, optical, chemical, mechanical, and software engineering, and they have collaborated with the marine scientists on an array of groundbreaking underwater sensors including:

- **The first-ever underwater mass spectrometer to detect and monitor contaminants that indicate marine ecosystem health and/or human activities like ship operations;**
- **an underwater Spectro-photometric Elemental Analysis System (SEAS) that analyzes water quality in environmental or homeland-security assessments;**
- **a Real-time Ocean Bottom Optical Topographer (ROBOT) that uses lasers to create three-dimensional topographic images of the ocean bottom for U.S. Naval mine counter-measures programs**

The Center for Ocean Technology (COT), which provides engineering support to the College's scientists. PHOTO: JOHN COLLINS

- **Micro-Electrical and Mechanical Systems (MEMS) and Nanotechnology to miniaturize and enhance sensors and control systems for a wide range of environmental applications**

COT has received significant support from the Office of Naval Research, the Coast Guard, the Army, and most recently, the Department of Homeland Security.

Betzer is an ardent advocate for the College's impressive achievements, but he never loses sight of the people behind the science. He takes particular pleasure in relating the accomplishments of students and alumni.

He tells of a PBS program about the search for sunken WWII battleship, the HMS Hood, and says it was alumnus David Mearns' company that conducted the search. Describing the 1985 graduate as an archeologist/technologist/historian, Betzer seems delighted by the fact that, "he's such an expert, he's now on 24-hour call from the US military to find anything they need to find in the ocean."

Lauren McDaniel, a student who left a nursing career to pursue a degree in molecular biology, just had an article accepted by *Nature* magazine.

"*Nature* rejects 95% of the submissions they receive!" Betzer explains. "It's a market that the most accomplished faculty member would give anything to be published in. This is a huge coup – a remarkable achievement for a student." McDaniel's based her article on her hypothesis that viruses cause red tides. "No one ever thought of this before," says Betzer, "And you know what? She's probably absolutely right."

In addition to training productive, creative scientists at the graduate level, the College demonstrates its commitment to younger school populations through a significant community outreach effort.

The Oceanography Camp is a three-week camp for Pinellas County girls who have completed 8th grade. Designed to inspire and motivate young women to consider career opportunities in the sciences, the program provides multidisciplinary, hands-on experiences in laboratory and field environments, as well as the advantage of one-on-one mentoring with scientifically accomplished female graduate students.

Other outreach efforts include Project Tampa Bay, an enrichment program for minority children designed to increase interest and awareness of the marine science environment; and Project Oceanography, a live, satellite-televised marine science education program design to enhance middle school science and math learning.

PHOTO: JOHN COLLINS

It is mind-boggling to consider the full spectrum of the work that is taking place in the College of Marine Science, particularly the collaborations between the ocean scientists and the COT engineers. That's why it comes as somewhat of a surprise when Betzer says, **"Oceanography Camp is the most important program that's ever been done here."**

But when you think about that, you realize that probably every CMS faculty member and graduate was at one time, a kid who got hooked on science. And one of the best ways for those teachers and researchers to ensure the future of marine science exploration and discovery is to prepare the next generation to share their passion and follow in their footsteps.

USF St. Petersburg and the College of Marine Science are currently joined in a partnership to seek funding for and develop the nation's most sophisticated and advanced Science and Technology Complex. With a proposed size of 140,000 square feet and an estimated cost of $29,570,647, the multi-use facility will be home to the following:

The College of Marine Science's Center for Ocean Technology. In addition to conducting state-of-the-art research, the COT has active business relationships with government and industry that can fuel rapid economic growth in this region.

USF St. Petersburg's Program of Distinction, Environmental Science, Policy and Geography. This undergraduate program will provide an interdisciplinary framework for the study of environment and society.

USF St. Petersburg's Office of Campus Computing, which is responsible for all technology and technological transfer, including campus wide academic computing and 'smart' classrooms' for training students in advanced technology applications.

The Science and Technology Complex will exert an enormous economic impact on the region, the state and the nation.