



## *Sea Side* / CAL POLY'S GROWING MARINE PROGRAM CONNECTS STUDENTS TO THE SCIENCE AND MANAGEMENT OF OCEAN ECOSYSTEMS.

*With the Pacific Ocean in Cal Poly's backyard, you might say that the university's largest lab covers about one third of the Earth's surface. And with such a rich resource so nearby, it's not surprising that the marine science program is on the rise.*

Established in 2002, the Center for Coastal Marine Sciences (CCMS) is the home of marine coursework and research at Cal Poly. The center boasts an interdisciplinary group of faculty that focuses on ocean health and marine resources — with an important twist. They also apply that science by engaging with the local fishing community, policy makers, and governmental agencies that manage ocean ecosystems. This combination gives students across the university hands-on experience in and beyond their majors.

"Students who get involved in marine research at Cal Poly are embedded in projects that show them the importance

of science and how science relates to problems that are happening in the ocean and society," said Dean Wendt, the university's dean of research and director of CCMS.

One such student is Andrew Lam, a senior computer engineering major who worked with scientists and engineers at the Monterey Bay Aquarium Research Institute. The team's research is aimed at reducing biofouling, which is the growth of algae and barnacles on underwater sensors, pier pilings and the bottoms of boats.

Historically, toxic coatings have been used to prevent biofouling, but since the Environmental Protection Agency



Photo Credit: Brittany App

began limiting the use of toxic paints, scientists have been investigating alternative coatings. The research team Lam worked with is studying the use of LEDs as an environmentally friendly option.

The chance to create real-world solutions drew Lam to the project. "If you look at any pier in the ocean, you'll see a lot of biofouling, which requires a lot of maintenance," said Lam. "Knowing that my device could mitigate those effects really adds to my motivation. This project has the potential to solve worldwide problems."

Lam conducted much of his testing at the one kilometer-long

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Cal Poly Pier in Avila Beach, Calif., the hub of CCMS's research. Only 11 miles from campus, the pier provides more than 40,000 square feet of off-shore space for classes and research.

One of the unique features of the facility is a flowing seawater system that allows researchers to conduct long-term studies of fish and invertebrates. Students and faculty discover how sea urchins may help cure skin cancer, study how climate change will affect marine invertebrates, and seek solutions to a variety of other challenges facing ocean ecosystems.

"This seawater system is a game changer," said Wendt. "It gives students and faculty the opportunity to study organisms over time. There's no other way to do that."

For students who want to observe marine life in a truly natural environment, Cal Poly also offers a scientific diving program.

"I don't think anything says Learn by Doing more than

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Cont'd from pg. 10

actually getting students into the medium they're studying," said Jason Felton, diving safety officer at CCMS.

For the first time this summer, the diving program offered classes leading to certification by the American Academy of Underwater Sciences. Many state and federal agencies require their divers to be certified, so the classes may help students land jobs after graduation.

The new diving certification is just one way the marine program is growing. This past year saw the addition of a new research boat (see story on next page) and a federally funded extension agent who will strengthen CCMS's connection to the community. The Biological Sciences Department also welcomed Ben Ruttenberg and Crow White to the faculty. Both men bring a wealth of experience in applied research and collaboration with government agencies.

Ruttenberg came to Cal Poly following a career with the National Park Service and National Oceanic and Atmospheric Administration. "I've been sitting on the other side, talking and working with the people who make policy," said Ruttenberg. "It broadened my view of how to make science work in a policy world."

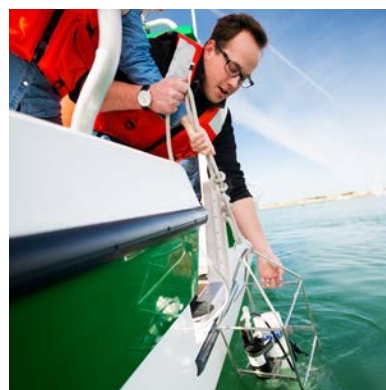
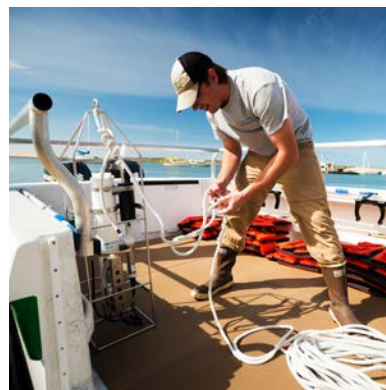
Students in Ruttenberg's new marine conservation and policy course got a taste of that world. They interned with different agencies and organizations that

## I DON'T THINK ANYTHING SAYS LEARN BY DOING MORE THAN ACTUALLY GETTING STUDENTS INTO THE MEDIUM THEY'RE STUDYING.

needed more scientific information before making a policy decision. "It gave them some real-world experience in this field, working with people who are in the jobs they might end up having," Ruttenberg said.

As a research scientist, White brings a unique mix of field study, lab analysis and modeling expertise to the marine program, as well as a focus on applying research to policy. "Almost all of my research has direct management implications," White said. "It captures students' interest more because they want to change the world and improve our existence."

With the energy, enthusiasm and resources growing in the marine program, it's hard to know what's next, but the possibilities are almost endless. The ocean is a very big place. //



Top Research Assistant Grant Waltz secures the instrument that measures conductivity, temperature and depth. Middle The instrument panel of the new Research Vessel TL Richards. Bottom Biology student Chris Tremonti takes his turn gathering data.