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## Encouraging Learning Through an Exploration of the Sea

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### Objective

The goals of this project were threefold:

- to teach young students basic science skills through an exploration of the wonders of the marine world;
- to expose students to academic research; and,
- to encourage students to pursue careers in the marine sciences.

### Summary

Dr. Miriam Polne-Fuller, a marine biologist at the University of California at Santa Barbara, received funding to support an educational outreach program for K-12 students. Under her direction, children from area schools worked with profes-

sional marine scientists on a variety of laboratory experiments. The 32 students who participated in the program were also taken on educational field trips to local beaches and wetlands, where they learned first hand about the natural history of the coastal environment. The students, in grades two through eight, were selected from schools where a majority of families qualify for federally subsidized school lunches. These schools serve a predominantly Hispanic community.

### The Project

Elementary students conducted cell biology experiments that highlighted the sensitivity of marine cells to changes in temperature, salinity, light intensity and water quality. In



A fifth grader in one of Dr. Polne-Fuller's programs works under a sterile laboratory hood, testing antibiotic properties of seaweed extracts.

one experiment, titled "Do Any Living Cells Truly Enjoy a Teaspoon of Beer?" students gazed under microscopes to observe the effects of alcohol on cell processes.

Older students studied the ecology of the giant kelp forest. Through this examination, they learned about photosynthesis and the physics of floating kelp stands. They also studied the chemistry of the sugars produced by kelp.

In addition to working with students, Dr. Polne-Fuller and collaborating teachers wrote educational materials on four different topics: the kelp forest, bioluminescence, marine worms as environmental monitors, and sandy beaches. The materials are designed to teach basic science skills targeted by the state's Science Standards and to expose students to ongoing research at the university.



Since the 1980s, California Sea Grant has helped support the award-winning "Young Marine Scientists" and "Teachers as Scientists" education programs created by Dr. Miriam Polne-Fuller of the University of California. Above, a group of high school students in the Summer Research Mentorship Program study a population of young fish in a local wetland. Photos: Dr. Miriam Polne-Fuller, University of California, Santa Barbara.

### Collaborations

The University of California at Santa Barbara also supported this project through a Faculty Outreach Grant and a Young Marine Scientist

Grant. In the past, her programs have received funding from the Professional Association of Diving Instructors, also known as PADI, and from the Boyd Foundation. California Sea Grant has awarded her two previous grants to support her efforts to educate traditionally underrepresented students in marine science disciplines.

Dr. Polne-Fuller continues to work with middle and junior high school science teachers in the Santa Barbara County School

District. In recognition of her unique commitment to teaching and outreach, Dr. Polne-Fuller was awarded the 2001 Alumni Association Teaching Excellence Award from the University of California, Santa Barbara.

#### **Cooperating Organizations**

California Department of Fish and Game  
U.S. Army Corps of Engineers

#### **For more information:**

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