Title
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 professional 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 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.

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

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California Sea Grant is a statewide, multiuniversity program of marine research, education, and outreach activities, administered by the University of California. Sea Grant-sponsored research contributes to the growing body of knowledge about our coastal and ocean resources and, consequently, to the solution of many marine-related problems facing our society. Through its Marine Extension Program, Sea Grant transfers information and technology developed in research efforts to a wide community of interested parties and actual users of marine information and technology, not only in California but throughout the nation. Sea Grant also supports a broad range of educational programs so that our coastal and ocean resources can be understood and used judiciously by this and future generations.

The national network of Sea Grant programs is a unique partnership of public and private sectors, combining research, education, and technology transfer for public service and dedicated to meeting the changing environmental and economic needs in our coastal, ocean, and Great Lakes regions.

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