

Neighborhood Science

Scripps Ambassadors

Modern science, especially at Scripps, often involves multi-institutional, international collaborations struck to understand complex global systems: El Niño, global change, ocean circulation. But modern science also concerns bringing awareness of the natural world to the public, be it a class of first-grade students, a panel of legislators, or a family watching the evening news on TV.

Wolfgang Berger, a Scripps geologist and oceanographer,

BY PAIGE JENNINGS



Share Knowledge with Community

Scripps professor Wolfgang Berger (pointing), an active proponent of Scripps outreach activities, conducts a community nature walk at San Dieguito Lagoon in north San Diego county.



Hands-on Experiences

served for more than a year as interim director of Scripps, prior to the arrival of current director Charles Kennel this past winter. While at the helm, Berger helped raise awareness at Scripps of the importance of public outreach, and its benefit to the local and global communities and to the institution.

“We are pushing the support systems of Earth to the limits,” explains Berger. “Now we must deal with the need of keeping the sky blue, the grass green, the water habitable for fish. Out of necessity, earth scientists now have to help to educate the public about the support systems of the natural world. Fortunately, children—the future citizens who will have to cope with change—are quite willing, even eager, to learn about these things.”

Programs provided by the Birch Aquarium at Scripps are a leading source of formal outreach for the

institution. Students across the country benefit from aquarium-designed curricula and from the knowledge of teachers trained at aquarium workshops. Locally, children tour the exhibits during field trips, participate in on-site classes, and experience the ocean through special courses and day camps during Summer Learning Adventures. The aquarium’s outreach van, Planet Earth Express, takes marine science and live animals to schools, retirement homes, civic events, and hospitals.

Although the aquarium touches hundreds of thousands of lives each year, it is far from being the sole source of Scripps outreach. Individual scientists, students, and staff members are involved in a wide variety of educational endeavors. The following stories demonstrate the impact Scripps “ambassadors” have on the community.

“San Diego is Scripps’s hometown, which makes the students here our neighborhood kids. I encouraged them to ‘hop the fence’ and get to know the institution.”

The person doing the encouraging is Scripps’s Kevin Hardy, and the kids he talks of were participants in last winter’s regional competition for the National Ocean Sciences Bowl, which took place at the institution.

Hardy, a senior development engineer with the Institute of Geophysics and Planetary Physics and a 26-year employee of Scripps, has been deeply involved in educational outreach since his oldest child entered school.

“I didn’t see enough hands-on science in my children’s education,” says Hardy. “There was more ‘read chapter 4 and we’ll have a test on Friday,’ rather than ‘let’s go to the lab and run the experiment.’ It didn’t seem there were enough people building levers and pulleys and showing the kids how things work. It’s such fun stuff, and I didn’t want my kids to miss out.”

Hardy has the gift for translating not only the importance and fun of science and technology, but also the concept that mastery of these fields is possible for most children.

“I think the proper kind of outreach gives the students an opportunity to see science and math work for them. They don’t have to be older or taller; their feet go all the way to the floor as it is. The answer to two plus two is the same for them as it is for a grown-up. When they grab these concepts it gives them a handle on their world. Then they can feel empowered to make a difference





in their future.”

Hardy was recognized last year for his devotion to outreach when he received the San Diego Science Educators’ Award for Excellence in Science Education/University Level.

What are some of the inventive things Hardy does to enthrall students and to win the support of teachers? Building underwater habitats for mice, model submarines, microrobotic cars, and remotely controlled aerial cameras (which attach to weather balloons) are examples of activities Hardy has developed for children.

On behalf of Scripps, Hardy’s efforts have gained national and international attention for the institution and the fields of science and technology. In July, he codirected Scripps Institution’s World Submarine Invitational ’98. Ten teams, mostly from undergraduate engineering programs across the country and Canada,

designed, built, and attempted to speed human-powered subs through a Guinness-sanctioned course off the end of Scripps Pier.

Last year, when Scripps hosted the San Diego regional competition leading to the National Ocean Sciences Bowl (NOSB) in Washington D.C., Hardy volunteered to be the event coordinator. The event became more than just a one-day competition among local high school teams testing their proficiency in marine sciences. With the help of the Birch Aquarium’s education department and many Scripps faculty and staff, Hardy arranged ship tours and seminars on topics ranging from El Niño to satellite oceanography. The NOSB competition involved only five students from each school; but, by offering the additional events, Scripps opened up the institution to as many students and family members as were interested.

“We designed it to be a hometown event. Most people have been to Scripps because of the aquarium, but we wanted these students to make the place a little more their own.”



Facing page, Berger discusses proxy climate records with geosciences graduate student Elena Perez. Above, Kevin Hardy (center) and students at the School of the Madeleine in San Diego observe the results of their unique “mouse house” underwater-habitat experiment. Right, Hardy on board RV *Melville* during a recent Scripps research cruise.

Speaking of Science...

When predictions of a wild El Niño winter first became public in southern California, long before the rainstorms and cliff failures, requests for public speakers began pouring in to Scripps. The audiences varied, but the requests were the same: tell us what to expect.

Jill Ives, Scripps's director of special events and speakers bureau coordinator, usually receives about a dozen requests a month. Preceding the winter of 1997-1998, requests doubled, and they came from a variety of groups: the U.S. Coast Guard, neighborhood gardening clubs, government agencies, and yacht clubs. Ives even had representatives of a local art

school ask to have an oceanographer discuss "essential information for the informed surfer."

Although El Niño topped the charts this past winter, the Scripps speakers bureau provides the public with timely, educational information year-round on all aspects of oceanography and the work conducted at the institution. Speakers are culled from among the faculty, researchers, administrators, and graduate students.

"As much as possible," Ives says, "I try to send our graduate students to give presentations. It is a great way for them to get experience explaining science to the public."


Explaining scientific concepts and

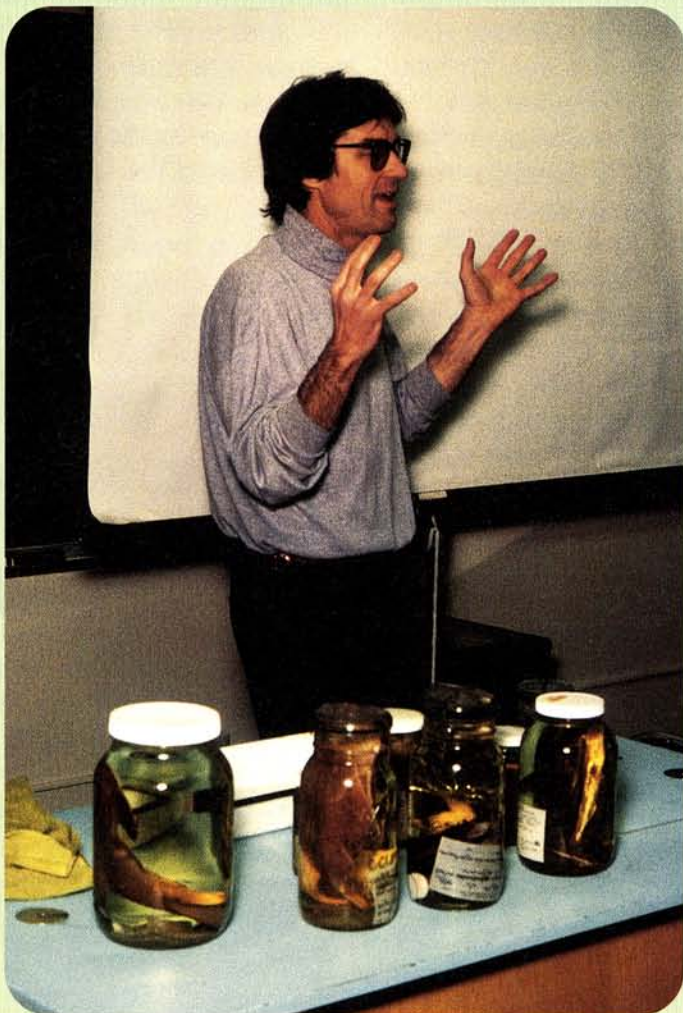
giving perspectives on how science fits into everyday life are important aspects of educational outreach, Ives points out.

In cooperation with KPBS-TV, the local public broadcasting station, Scripps and UCSD participate in a program that places professional scientists in local classrooms to discuss their work and their lives as scientists. The KPBS Seek Out Science volunteers develop special presentations that bring the world of science to life for students in middle school and high school.

"We target eighth grade because this is the year that students decide whether or not they are going to go into a pre-college orientation," explains Barbara Ransom, the UCSD coordinator for KPBS Seek Out Science. "At this age, how well equipped are most kids to make these types of decisions? We're hoping that through this program we can provide information that will give them more possibilities. One of the biggest misconceptions of this age group is that some things, such as a career in science, are unobtainable goals."

Ransom, a geologist at Scripps, decided to help coordinate other scientists from Scripps and UCSD after participating in Seek Out Science as a speaker. She believes it is crucial for the public to understand and have a greater stake in what takes place in the labs, classrooms, and offices at Scripps. And young students need to know that a career in science, or at least literacy in science, is obtainable, she contends.

"I usually tell the kids that not only can they do something they like and make pretty good money as a scientist, but they can have all sorts of adventures too. All they need to do is find something they are truly passionate about and then learn the tools that allow them to do it." 



Climate Science to Sun Safe

With a masters degree in meteorology, Mary Tyree, a computer programmer and analyst with the International Research Institute for climate prediction at Scripps, knows about the sun. She uses this knowledge to help elementary students protect themselves from the dangers of sun exposure.

“I became involved in the SunSmart program when I started doing volunteer work at Scripps Memorial Hospital,” says Tyree. The hospital’s Stevens Cancer Center targets young students,

mostly third graders, with the SunSmart program to teach them the effects of the sun on the human body and show them what skills they need to stay safe.

On the job at Scripps Institution, Tyree runs global atmosphere and ocean computer models to simulate the earth’s climate.

These models are an integral part of her research group’s goal: to know, up to a year in advance, what the main weather patterns will be in specific areas of the world.



Because of her job, Tyree focuses most of her volunteer efforts on weekend SunSmart activities, such as at sporting events, but sometimes uses her lunch break to attend school science fairs. She is on hand to help lead age-appropriate activities, such as having the children draw pictures of themselves enjoying an outdoor activity safely, and to discuss the science behind the sun and climate.

“Specifically, I’ve been involved in developing a curriculum aimed at the third-grade level. I help with the science of such topics as how sunlight, especially ultraviolet radiation, reaches the earth, and why we have to worry about UV radiation, even on cloudy days.”

Facing page, H.J. Walker, senior museum scientist in the Scripps fish collection, gives a classroom presentation. Left, Programmer/analyst Mary Tyree conducts an educational workshop at Torrey Pines Elementary School in La Jolla. Above, Tyree and colleague Martin Olivera in their office at the International Research Institute for climate prediction at Scripps.





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Empowering Young Students

During the summer of 1996, 18 students, mostly from inner-city junior high schools, spent the weekend on the UCSD campus learning about computers. One of their teachers, who also filled in as counselor, dormitory patrolman, and friend, was Steve Diggs, data manager for the World Ocean Circulation Experiment Hydrographic Program at Scripps.

The computer camp, a project of the San Diego Council of Black Engineers and Scientists (SDCBES), was a real challenge according to Diggs. "In one weekend we tried to teach the kids everything they needed to know about computers. At the end of the weekend, to the student who had tried the hardest and improved the most, we gave away a complete computer system and hooked her computer up to the Internet."

He remembers clearly how beneficial it was for the students, and how difficult it was to find them initially. "We had to put out applications in local churches and with school counselors, and we had to find out who was eligible. The bad thing about that is often people only give opportunities to the students who are already going to

do okay. We were looking for the diamonds in the rough, people who may have had some behavioral problems, but who we knew were capable. Those are the hardest kids to find; no one tracks them."

Through his involvement with SDCBES, Diggs also tutors students and helps the council determine recipients of annual scholarships, totaling up to \$15,000. The scholarships go to high school students planning for college and to younger students who show promise.


Beyond his work with the council, Diggs, an accomplished long-distance runner, raises money for the Leukemia Society of America by being a member of the San Diego Marathon "Team in Training." He also gives presentations about careers in the computer field, and, more currently, about environmental sciences and how computer science relates to these disciplines.

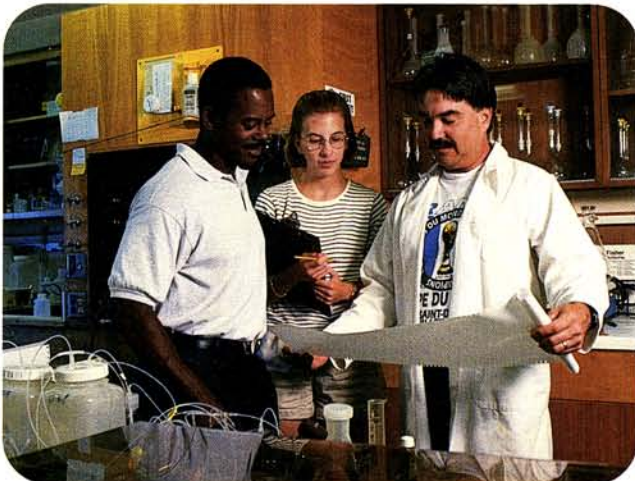
"I tell kids they can be anything they want; they don't have to be a doctor, a lawyer, a teacher, or something that is well defined. They can use their talents to create what they want."

The Bigger Outreach Picture

The educational roles that many Scripps representatives play in the community may not relate directly to their jobs or to the institution, but each time a person is inspired to learn, or a student is turned on to the possibility of a career in science, society benefits.

Berger, who put aside many of his personal outreach efforts during his tenure as Scripps director, is now working on a new book for teachers regarding the history of the ocean. He also gives public lectures, works with teachers, and continues to be a leading proponent of outreach at the institution.

"Some people have pointed out to me that we scientists have no choice but to practice outreach and general education," says Berger. "The public will cut off our funds if we don't prove to be useful and tell them what we are doing. There is truth in such statements, but it is not the whole story, and perhaps not the important part of the story. We should do it because we are part of the problem if we don't, not because we might lose the privilege of following our calling as scientists." 



Facing page, Scripps data manager Steve Diggs during a recent marathon benefiting the Leukemia Society of America. Left, Diggs reviews analytical procedures with Doug Masten of the Scripps Oceanographic Data Facility and assistant Heidi Buck, a UCSD undergraduate student.