



The Fire Within

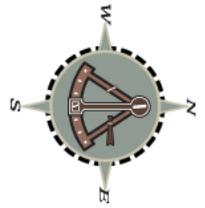
Ship to Shore: Linking Science to Education

As Irish poet William Butler Yeats said, “Education is not the filling of a pail, but the lighting of a fire.” It is the spark of recognition, understanding, and pure excitement of a child who has made a new discovery about how the world works. We have all seen this spark, whether it is in our own children or others, and this fire burns especially bright when they make a personal, hands-on discovery about the animals, plants or the events of the natural world.

Although the ocean covers 71% of the planet, is a large and steadily growing source of the world’s protein, and is responsible for regulating the earth’s climate, ocean science education is not always available for young students. This is often due to resources, especially for many inner-city schools and students.

USC Sea Grant has a strong record of connecting ocean science and policy to education by reaching out to the local community of Los Angeles, meeting with and responding to requests from educators, youth or families, and providing educational resources to connect children to the ocean. Where connections are made, learning takes place, across many environments, bridging generations and resource gaps.

Whether through the Parent-Child Education Program which meets in the evenings in local schools or community centers, or the Island Explorers Program and curriculum, which connect classes and teachers to local marine scientists, USC Sea Grant’s goal is to make current marine science and local scientific experts available to all people in Los Angeles. *(continued on page 2)*



URBAN MARINER

USC Sea Grant’s Urban Ocean Report, December 2010, Vol 2, No. 3

At the Helm: From USC Sea Grant



Dr. Linda Duguay,
Director, USC Sea Grant

Please welcome USC Sea Grant Director Linda Duguay “at the helm” of this fifth issue of the Urban Mariner, USC Sea Grant’s Urban Ocean Report!

With funding shortages for U.S. education at all levels, this is a critical time for the future of ocean and environmental science education.

The U.S. National Science Foundation (NSF) Centers for Ocean Sciences Education Excellence (COSEE)—a national network of distributed centers that integrates ocean sciences research and education and works with both informal and formal education partners—held an education community meeting in Washington, DC this November 2010 to develop a strategic plan for ocean education for the next decade. COSEE has been seeking the input of a broad range of participants and participation at the November meeting to determine how to catalyze ocean science education efforts at all levels of learning and engage the ocean science research community in this effort.

As head of USC Sea Grant, lead PI for the COSEE-West program, the 2010-2011 Chair of the National COSEE Council and Chair of the Decadal Review Working Group, I am looking forward to a year that is busier than ever and a total immersion into the world of ocean science education and research. If all goes well, the goals of COSEE will continue into the next decade informing, enlightening and inspiring students and the public to the need for greater understanding and awareness of the role of the ocean in their lives. Additionally, I hope that we can make those we engage aware of the multitude of careers that exist for individuals with strong science backgrounds and inspire more of them to pursue careers in science, technology, engineering and mathematics (STEM).

Previous issues of the Urban Mariner can be found at: <http://urbanmariner.urbanocean.com>.

The Fire Within

(cont'd from pg. 1)



Counselors guide young scientists as they begin a dissection. (Photo credit: Linda Chilton)

Despite proximity to the coast, there are many children here in the Los Angeles watershed who have never seen the ocean. What is perhaps more remarkable, though, is the undeniable connection many of these children feel to the ocean upon seeing it for the first time, and the fire lit inside them to learn everything about it.

This connection is more than just emotional or intellectual; all ocean education programs and curriculum through Sea Grant teach about the ways in which humans can affect the ocean environment, whether through urban-runoff, pollution, over-fishing, or physical habitat destruction. The current research funded by USC Sea Grant is critical, as is its application to current policy and management strategies. However, perhaps even more critical, is making sure the next generation of children understands their own profound connection to and responsibility for the health of the ocean, no matter how far away they live from the coast. The future of ocean science and policy depend on their education.

What is Sea Grant?



Sea Grant is a nationwide network—administered through the National Oceanic and Atmospheric Administration (NOAA)—of 32 university-based programs that work with coastal communities. The Sea Grant Program at the University of Southern California has served the Southern California coastal region since 1972, funding research, transferring results to government agencies and user groups, and providing information about marine resources, recreation and education to the public.

In Depth: About the Education Programs

The Sea Grant Program at the University of Southern California actively embraces environmental education as an important tool to manage the impacts of urban populations on the marine environment. Ensuring that students in urban areas have opportunities to learn about the marine environment is of great importance. To accomplish this, USC Sea Grant has long been dedicated to providing teaching resources in English and Spanish and to helping educators teach the principles of marine science and environmental stewardship to urban youth. Below is a brief description of USC Sea Grant's educational programs. For more information, please visit: www.usc.edu/org/seagrant/.

COSEE West

The Centers for Ocean Sciences Education Excellence (COSEE) is a national network of distributed centers that integrates ocean sciences research and education and is supported primarily by the National Science Foundation's, Division of Ocean Sciences. Dr. Linda Duguay, Director of USC Sea Grant, is currently the Lead PI for COSEE-West which started in 2002 as a partnership with the University of California at Los Angeles (UCLA), the College of Exploration (COE) in Virginia, Los Angeles Unified School District (LAUSD) and a number of Southern California science centers and aquaria including - the Natural History Museum of Los Angeles County, the Aquarium of the Pacific, the Cabrillo Marine Aquarium, the California Science Center, and the Santa Monica Pier Aquarium. COSEE-West offers online workshops for teachers which engage University researchers as the lecturers and discussants; on-site professional development workshops for teachers; a week long summer teacher institute focused on Ocean Observing Systems; organized retreats for scientists and educators; and professional development workshops for informal educators such as staff and volunteers at ocean science education centers (i.e. local aquaria).

Example Partnership:

COSEE West, Los Angeles Charter School Science Partnership, and the Los Angeles Education Partnership

COSEE West, the Los Angeles Education Partnership (LAEP) and twenty six charter schools (LACSSP) have received funding from California Math Science Partnership to research the efficacy of long term intensive training and support for 3rd – 8th grade science teachers. COSEE is bringing the lens of ocean sciences and the expertise of researchers to engage teachers in current science as they develop their skills as educators.

For more information on COSEE West:
<http://www.usc.edu/org/cosee-west/>



Los Angeles-based teachers attend a COSEE-West organized workshop to learn about current oceanographic science. (Photo credit: Gwen Noda)

In Depth: About the Education Programs (Con't from page 3)

Island Explorers

Sea Grant's Island Explorers Program exposes students to marine science and other science disciplines through classroom use of curriculum materials. The student-centered science curriculum is characterized by hands-on marine science and uniquely focuses on Southern California and Catalina Island coastal environments. It is multidisciplinary and multifaceted, introducing students not only to marine biology, but to geography and geology, physics, chemistry, and ecology. To support teachers in the use of these curricula, Sea Grant provides teachers with lessons plans and in-person and online workshops with scientific experts.

As part of the Island Explorers program, many students participate on field trips to local beaches and aquaria, or travel by vessel to the USC Wrigley Marine Science Center (WMSC) on Catalina Island on Santa Catalina Island for single day and overnight programs. The overnight trip to the USC island campus opens an entire world to students who have never been to the ocean or out of the city. On the boat ride over, students observe oceanographic characteristics and local marine life including birds and cetaceans.

Once at the USC Wrigley Marine Science Center, students participate in waterfront studies, laboratory experiments, and island biogeography excursions. Those students who attend a three-day trip gain their first experiences snorkeling in a marine protected area. They collect data for individual and group research projects which they have prepared for during classroom time.

Parent Child Education Program

The Parent Child Education Program is a unique opportunity for students and their parents to learn together. Parent/guardian-child teams meet weekly at a school or community center to learn about marine and environmental science issues, connecting the urban environment and the ocean. Sea Grant's goal is to excite students about learning science and enhance and empower both the students and their parents through open communication, team building and learning activities.

Each application of the Parent-Child program is adapted to the community it serves. The Expo Center, a facility of the City of Los Angeles, has embraced the program offering quarterly sessions serving the surrounding community with funding from the University Neighborhood Outreach Program. (Con't on next page)

Floating labs provide hands on investigations for Expo family teams participating in the Parent-Child Education Program (Photo credit: Linda Chilton)



In Depth: About the Education Programs (Con't)

The Parent-Child Education Program became a monthly family science night at Woodlawn Elementary in the city of Bell, just east of Los Angeles, where whole families came to learn together about the water cycle, their own watershed, and how to protect their environmental resources. Families learned through simulations, by using microscopes, by conducting squid dissections, and by evaluating water quality. A beach field trip provides a first experience for many participants who have never been to the beach or seen the ocean as well as provides an understanding of how their actions can impact the marine environment.

The Parent-Child Education Program makes basic science concepts approachable for parents and students working together, and helps to develop a sense of environmental stewardship, independent thinking, a lifelong interest in science and awareness of career opportunities.



Family teams in the Parent-Child Education Program share their squid dissection. (Photo credit: Josie Chan)

Partnerships

Partnerships are an invaluable way to reach a broader range of students than Sea Grant could alone. USC Sea Grant has informal education partners, such as the Fish Contamination Education Collaborative, through which they work with the Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) to educate anglers and families about safe seafood consumption. Sea Grant also partners with the Los Angeles Maritime Institute, working to bring at-risk youth on tall ships where they develop their skills as a team and broaden their horizons in the marine sciences and possible marine and science related careers.



Woodlawn Elementary School family-learning begins with curiosity, as the microscopic ocean world is revealed through the lens of a microscope. (Photo credit: Josie Chan)

Example Partnership: Key to the Sea

USC Sea Grant is a founding partner with Heal the Bay, Santa Monica Pier Aquarium, Cabrillo Aquarium, the Roundhouse and the SEA Lab in developing the 'Key to the Sea' watershed education program, which provides K—5th grade educators the knowledge, skills and resources to incorporate watershed education into their curriculum. Teachers participate in a day-long training enabling them to subsequently bring students on a fieldtrip to one of the four partner sites. If they are interested, classes are also guided through participation in a local stewardship project.

In Depth: About the Education Programs (Con't from page 5)

USC Sea Grant/Wrigley Young Men and Young Women in Science Summer Programs

Week-long Summer Science Programs for Young Women and Young Men provide middle school and high school students the opportunity to visit the USC Phillip K. Wrigley Marine Science Center on Catalina Island, located 20 miles off the coast of Los Angeles. Students are introduced to oceanography through a series of hands-on experiences and scientific investigations. They learn the effects that humans have on a delicate ecosystem through the study of marine biology and oceanography. Through engagement with USC students, faculty and guest scientists, students learn the value of science, what it takes to pursue a career in science and the wide diversity of science applications including environmental policy, research science, education, illustration, and diving safety.



At the USC Wrigley Marine Science Center on Catalina Island, a young scientist collecting research data weighs a sample fish. (Photo credit: Linda Chilton)

Featured Student: Deshawn Roberts

During the week-long Summer Science Program for Young Men on Catalina island, Deshawn Roberts and his partners developed their own pilot study to investigate the impacts of urban runoff on kelp using the local marine protected area. They presented their findings to the larger group at the end of the program.

Deshawn said, *"I would like to thank the USC Wrigley Institute for the opportunity to participate in the Young Men in Science Program. By participating in the 2010 summer program, I have learned that life in the ocean is not always respected. Various forms of pollution such as sediment deposition from sewage, industrial*

byproducts, contaminants like PCBs, heavy metals, copper, zinc and runoff from agricultural are major problems and cause a lot of damage to kelp and the ocean. Marine protected areas offer a solution, have a positive impact on kelp, and may also allow for the regeneration of kelp that has been impacted by urban runoff."



Three youth, including Deshawn Roberts (center), collaborate on a research project in the lab. (Photo credit: Linda Chilton)

In Deshawn's case, this was not his first introduction to marine science nor to Sea Grant. In 2007, he participated with his mother in the Parent Child Sea Grant program. USC Sea Grant considers Deshawn an example of success in its education program. His first experience with his mom in the Parent-Child Education Program drew him back to Catalina Island to learn more. The proverbial fire within Deshawn was lit!

Educator's Quarters: About the Educators

The veracity of French writer Joseph Joubert's statement, "To teach is to learn twice," is apparent when you speak with Linda Chilton, USC Sea Grant's Education Coordinator and Lynn Whitley, Director of K-12 Education at the USC Wrigley Institute for Environmental Studies. As the best teachers do, Lynn and Linda are constantly learning. They both agree that "watching the excitement of students mastering something new, realizing a concept, or watching families share in discovery together...this epitomizes the successes of life-long learning."

Linda Chilton, Sea Grant Education Coordinator



Linda Chilton

Knowing the importance of intergenerational learning and reaching the urban communities who do not always connect with the ocean, Linda dedicates much of her time and energy to connect informal science experiences with current research and ocean issues. She is committed to creating partnerships to build stewardship engagement and support underrepresented audiences in pursuing interests in understanding the marine environment. Formerly a longtime science educator at the Los Angeles City's Cabrillo Aquarium, Linda is known throughout the region for her knowledge of marine science and her ability to translate that knowledge into education programs that fascinate youth and adults alike.

She is a member of the Channel Islands National Marine Sanctuary Advisory Team Education Subcommittee, a member of the Informal Science Institution and California State University Partnership (ISI-CSU) Advisory Council, a member of the Think Watershed Advisory Council, the Santa Monica Pier Aquarium Advisory Board, and the USC Neighborhood Outreach Committee.

Lynn Whitley, Director of K-12 Education, USC Wrigley Institute for Environmental Studies



Lynn Whitley

Lynn Whitley directs the K-12 education at the USC Wrigley Institute for Environmental Studies and is also co-director of the Centers for Ocean Sciences Education Excellence (COSEE)-West. Lynn is a well-respected educator whose leadership in the

National Marine Education Association and the Sea Grant Education network has raised the visibility of both enterprises. Lynn is on the Santa Monica Pier Aquarium Advisory Board, a member of the USC Community Relations Council, a board member of the Southwest Marine and Aquatic Educators Association, and will be serving on the Science Curriculum Framework and Evaluation Criteria Committees which will review the California Science Framework and make recommendations on the revised Science Framework for California Public Schools.

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