

## CITIZENS' SCIENCE BRINGS TOGETHER SCIENTIFIC INVESTIGATION, TEACHING AND LEARNING RESEARCH, AND COMMUNITY OUTREACH

**A new partnership between the School of Education** (Associate Professor Rossella Santagata & Assistant Professor Hosun Kang), **the School of Biological Sciences** (Professor Travis Huxman, Dr. Sarah Kimball, & Dr. Jennifer Long) **and the Crystal Cove Alliance** (Sara Ludovise & Holly Fletcher) **brings undergraduate teaching, the learning sciences, environmental science research, and community outreach together to improve STEM teaching and learning and to prepare the next generation of stewards of biological resources.**

## CITIZEN SCIENCE CRUISES AS LABORATORIES TO STUDY LEARNING

Last fall, Cal Teach students enrolled in EDUC55 – Knowing and Learning in Math and Science, taught by Associate Professor of Education Rossella Santagata, conducted observations and interviews with middle and high-school youth who participated in Citizen Science Cruises led by Crystal Cove Alliance education staff (<http://www.crystalcovealliance.org/education/k-12-school-program-catalogue/>).



Holly Fletcher (Crystal Cove Alliance) prepares the camera for a digital fishing investigation; Cal Teach students learn to use equipment to collect ocean water samples; Associate Professor Santagata discusses with Cal Teach students the data they collected on youth's learning from participation in the citizen science cruises; and, Dr. Jennifer Long (Education and Outreach Coordinator at UCI Center for Environmental Biology), Sara Ludovise (Crystal Cove Alliance Director of Education) and her staff visit Educ55 Cal Teach class to share learning and scientific goals of the Citizen Science cruises.

## CITIZENS' SCIENCE PROJECT CRYSTAL: "WHERE DOES THE WATER GO?" DEVELOPING LIFE-LONG SCIENCE LEARNERS THROUGH A UNIVERSITY/STATE PARK PARTNERSHIP

*Rossella Santagata & Hosun Kang (School of Education), Jennifer Long, Travis Huxman, and Sarah Kimball (Center for Environmental Biology, School of Biological Sciences), and Sara Ludovise (Crystal Cove Alliance). **Funded by the Nicholas Endowment.***

The "Where Does the Water Go?" project will design, implement, and study a 5<sup>th</sup>-grade program (including classroom lessons and field trips at Crystal Cove State Park) focused on water conservation and aligned with the Next Generation Science Standards. Children will engage in authentic environmental research around the topic of land conservation and restoration. The data collected by children will be analyzed in Dr. Kimball's research lab at the UCI Center for Environmental Biology.



The program will address timely and local climate change issues, such as the drought that is currently affecting our local communities. A mini-conference will conclude the program with children working collaboratively with UCI scientists and students to summarize their findings and present them through a poster session to their families and communities.

The project will examine the development of children's systems thinking and serve as a signature program and model for other STEM programs at Crystal Cove and other State Parks. The science data collected will inform the Park's adaptive management decisions.



During the water conservation program, children will investigate the question "Where does the water go?" Changes in the water cycle represent both causes and consequences of contemporary climate change; no other large-scale Earth process is more critical to the human endeavor than the hydrologic cycle, which defines the availability of fresh water to support society. The program will involve approximately 60 children during 2016 through a partnership with the Santa Ana Unified School District. In addition, 20 UCI undergraduate students from the Education Sciences Major, the Cal Teach Program, or the Center for Environmental Biology Internship Program will be involved in the field trips and in learning and science data collection and analyses.