

# TAHOE: STATE OF THE LAKE REPORT 2016

## EDUCATION AND OUTREACH

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### TERC education and outreach

In 2015

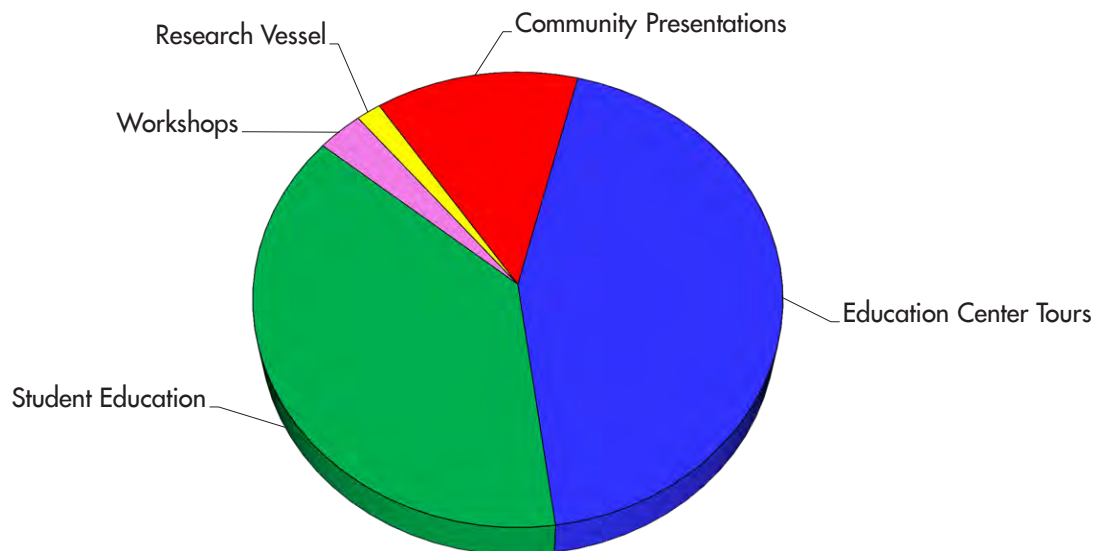
Part of TERC's mission is education and outreach. Our public, K-12, teacher professional development, and volunteer programs are designed to provide science-based information about the Lake Tahoe region in order to foster responsible action and stewardship.

During 2015, TERC recorded 12,344 individual visitor contacts. The majority represented student field trips and visitors to the Tahoe Science Center (Thomas J. Long Foundation Education

Center) at Incline Village. In addition, TERC hosts monthly public lectures and workshops, makes presentations to local organizations, and takes a limited number of visitors out on our research vessels. TERC organizes and hosts annual events and programs including Children's Environmental Science Day, Science Expo, Youth Science Institute, Trout in the Classroom teacher training program, Project WET workshops, Summer Tahoe Teacher Institute, and a volunteer docent

training program.

TERC also partners with numerous groups to deliver environmental science education in the Tahoe basin. In 2015, these included AmeriCorps, Lake Tahoe Outreach Committee, North Tahoe Environmental Education Coalition, Sierra Nevada College, Sierra Watershed Education Partnerships (SWEP), South Tahoe Environmental Education Coalition, UC Davis Young Scholars, and many others.



Total Number of Contacts: 12,344

## EDUCATION AND OUTREACH

### TERC educational exhibits

In 2015

Each year, TERC works to improve our exhibits and increase the offerings available. During 2015 we developed a new exhibit, a mobile app, curriculum, games, and a 3-D movie that aids in our mission to provide engaging exhibits and interactive hands-on educational activities. Interactive touchscreens for

the new “Lake Tahoe in Depth” exhibit allow visitors to examine real-time conditions all around the lake. The “Citizen Science Tahoe” app allows anyone using a smart phone to report conditions they see at the beach. New curriculum, such as the algal growth experiment, teaches students about

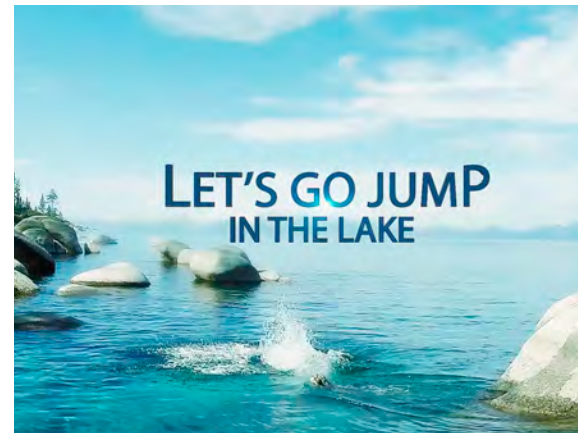
nutrients that affect the blueness of Lake Tahoe. A game called “Pollution Adds Up,” teaches students about the cumulative impacts of non-point source pollution. Finally, TERC’s newest 3-D movie “Let’s Go Jump in the Lake” is now available for viewing at the Tahoe Science Center.



Visitors view real-time lake conditions (photos, live camera views, weather, and activities) in the “Lake Tahoe in Depth” exhibit now available at the Tahoe Science Center. This project was funded by the Institute for Museum and Library Services, Nevada Division of Environmental Protection, and the North Lake Tahoe Resort Association. Photo: A. Toy



Education-specific funding allows TERC to enhance our education programs and develop new activities. Funded by the Nevada Division of Environmental Protection, the activity ‘Pollution Adds Up’ has students identifying different sources of pollution and learning about the cumulative impacts of non-point source pollution on a waterbody. Photo: A. Toy



Now showing: TERC’s newest 3-D movie “Let’s Go Jump in the Lake” is finally here! Take a guided trip into Lake Tahoe, meet the creatures living in the lake, and witness the physical changes a lake experiences over the course of a day, a season, and a year.



## EDUCATION AND OUTREACH

### TERC educational exhibits, continued

In 2015

TERC's augmented reality (AR) sandbox exhibit, originally developed as part of a National Science Foundation grant, has spread far beyond its home in our Tahoe Science Center. This spring, a new portable version went to Washington, D.C., where it was featured at the White House Water Forum, the USA Science

and Engineering festival, and a Center for National Science Funding event at the Congressional Rayburn Building.

Since debuting in 2014, the three original AR sandboxes—located at TERC, the Lawrence Hall of Science, and ECHO Lake Aquarium and Science Center—have inspired over 150 users across the

globe to build their own sandboxes. Used as an educational tool, AR sandboxes can teach students and visitors about geomorphology, topography, hydrology, and landforms. Experience the AR sandbox in person at the Tahoe Science Center or visit [www.ARsandbox.org](http://www.ARsandbox.org) to learn more.



Portable augmented reality (AR) sandbox exhibit on display at the USA Science and Engineering Festival in Washington, D.C. Oliver Kreylos, Heather Segale and Geoff Schladow were special invitees to represent the National Science Foundation at the event. Photo: Sherry Hsi



The portable AR Sandbox exhibit's final home was the Howard University Middle School, where it will be a permanent feature in Mrs. Hardeen's sixth-grade science class. The hand over ceremony was attended by NSF administrators, D.C. education officials, and the trustees of Howard University.



More than 150 AR Sandboxes have been developed following the original LakeViz3D model. These include sandboxes at schools, universities, research centers, government organizations, museums, and science centers. The AR Sandbox is being used to investigate and teach a wide array of topics, including geology, soil science, hydrology, energy and mineral exploration, forestry, seismology, military operations, coastal engineering, regional planning, and disaster preparedness.

## EDUCATION AND OUTREACH

### TERC educational programs

In 2015

In addition to providing education center tours for the general public, the TERC Education Team provides high quality informal science education to more than 4,700 third- through eleventh-grade students by hosting over 100 field trips each year.

Other K-12 educational programs include Trout in the Classroom,

coordinated in partnership with Sierra Watershed Education Partnerships, which is designed to teach students about the ecology, biology, and history of trout and other aquatic life. This year, we raised Lahontan cutthroat trout in an aquarium in the science center. Students from schools around the region also raised trout for release into local waterways.

Each year a small group of select high school students participate in the annual Youth Science Institute from January through May. Through this after-school program participants work with scientists, conduct experiments, and share science activities with other students.



Groups visit TERC for informal science education programs on water, geology, ecology, and biology. Pictured here, are future California Naturalists learning what makes an educator great and the importance of landscaping with native plants at the Tahoe City Demonstration garden. Photo: A. Toy



Students witness the early life stages of a Lahontan cutthroat trout as part of the Trout in the Classroom program. Students release their Lahontan cutthroat trout fry into Incline Creek in hopes that they will thrive in their native Lake Tahoe. Photo: A. Toy



Students in the Youth Science Institute (YSI) are exposed to a variety of science, technology, engineering, and math fields, including fish dissection, medicine, chemistry, robotics, engineering, and computer coding. In the above photo Joanna Koch MD teaches Andrew Bourke how to perform basic medical procedures. Photo: E. Portier



## EDUCATION AND OUTREACH

### TERC educational programs, continued

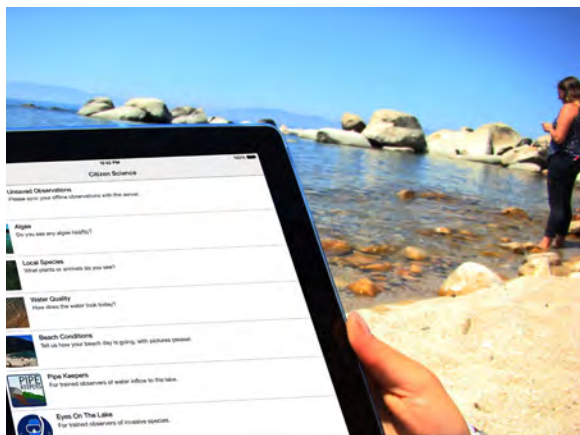
In 2015

Each year we train new volunteer docents at our annual June Docent Training. Volunteer docents become local experts and lead public tours at our two science centers. Volunteers also participate in garden work each year to make the Tahoe City Field Station's native plant demonstration garden a beautiful

community resource.

Visitors that come to our science centers can view exhibits, watch 3-D movies, and participate in citizen science by conducting water quality monitoring and investigating plant phenology. Public participation in scientific research is educational for adults and children and

provides useful data for scientists. Additionally, for the past several years, TERC has hosted a summer Tahoe Teacher Institute for educators from both California and Nevada aimed at enhancing science, technology, engineering, and mathematics (STEM) education.



TERC's "Citizen Science Tahoe App," launched in August 2015, encourages beach-goers to take a couple of minutes to report beach and lake conditions. The information is shared with scientists and provides a more in depth look of conditions around the lake. Photo: A. Toy



Doug Graham and Larry Patzman are two of TERC's newest volunteer docents. During docent training they joined boat captain Brant Allen on the research vessel John LeConte and viewed Tahoe's native zooplankton. Photo: A. Toy



TERC creates new science activities to enhance student interest in citizen science. In the "Algal Bloom Experiment" students discover that nutrients stimulate algal growth in Lake Tahoe water. Students learn that by reporting algal growth through the "Citizen Science Tahoe" app officials are more likely to pinpoint sources of nutrient pollution. Photo: B. Lewis

## EDUCATION AND OUTREACH

### TERC special events

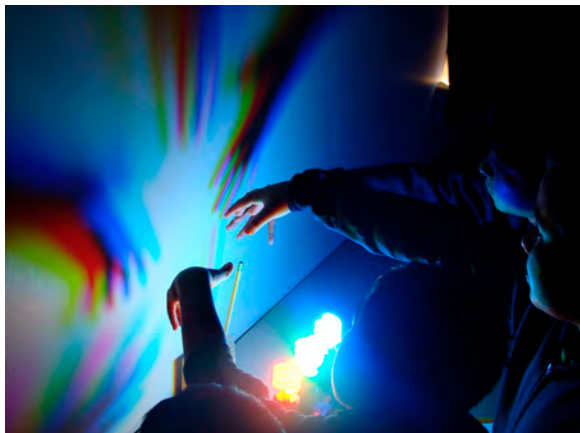
In 2015

TERC hosts monthly lectures throughout the year on various environmental issues, new scientific research, and related regional topics of interest. Recent topics have included, “Gratitude Works! How Gratitude Heals, Energizes,

and Transforms Lives”, “The Physics of Snow”, and “Exploring Mars with Curiosity.”

Special events hosted annually include Project WET training workshops (February), Science Expo (March),

Garden workshops (June - August), Summer Teacher Institute (July), and Children’s Environmental Science Day (August).



At the 11th annual Physical Science Expo students learn about light mixing using their hands and other items to block out colored light to create different colored shadows. Photo: A. Toy



This year was the first ever Science Expo to be held in South Lake Tahoe on the Lake Tahoe Community College campus. A student pictured here uses a Van de Graaff generator to learn about the flow of electrons. Photo: A. Toy



Scientists and organizations from the Tahoe basin participate in TERC’s annual Children’s Environmental Science Day. This community event builds knowledge, encourages conservation, and develops partnerships. In 2015, Commons Beach in Tahoe City became the new location for this fun, family event. Photo: N. McMahon