



Photo by Melanie MacTavish

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CARING FOR OUR Watersheds California

Caring for Our Watersheds is a program that empowers students to imagine, develop and create solutions in their local watersheds. The program promotes watershed awareness and stewardship, values student ideas and offers support when turning theoretical ideas into action. Judges in the environmental field score student entries, and 10 projects are selected for the final competition, held this year on March 29. Students presented their projects and finalists received cash awards and matching awards for their school. In addition, \$10,000 in implementation funding (up to \$1,000 per project) is available to all participants, so any student can see his or her idea turn into a reality.



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*Caring for Our Watersheds is a joint program of the
Center for Land-Based Learning and Agrium.*

Finalists at the Caring For Our Watersheds Final Competition on March 29, 2014.



OUT OF 335 PROPOSALS SUBMITTED THIS YEAR, THESE 10 ADVANCED TO A FINAL COMPETITION WHERE STUDENTS COMPETED FOR \$12,000 IN AWARDS FOR THEMSELVES AND THEIR SCHOOLS.

Project: USE THE DRIP AND DROP THE DROUGHT

Team Members: Taylor Davies
School: Colusa High School

Description: Install drip irrigation in the school agriculture field and create a demonstration project to compare different watering techniques and respective efficiencies in regards to water use and soil moisture. Drip irrigation is more effective and conserves more water than traditional sprinkler or flooding techniques.



Project: CREATING A RAIN GARDEN

Team Members: Sabrina Sullivan
School: Mira Loma High School

Description: Create a rain garden to address issues of stormwater runoff. Rain gardens allow runoff to soak into the ground instead of picking up pollutants en route to storm drains and waterways. Native plants used in these gardens also provide habitat for birds, butterflies, and beneficial insects.

Project: NURTURING THE NATIVE BEES

Team Members: Emma Forester
School: Antelope High School

Description: Plant a native pollinator garden and install bee blocks to provide habitat for native bees. Many native bee species pollinate effectively and are not susceptible to the Colony Collapse Disorder that has harmed the European honey bee populations traditionally used in agriculture.

Project: DEMONSTRATING THE EFFECTS OF PERVIOUS CONCRETE

Team Members: Emerald Johnson, Zoe Phillips
School: George Washington Carver High School

Description: Construct a model of pervious concrete and demonstrate its benefits to the public at the Sacramento Home and Garden Show. Using pervious concrete can protect water quality by allowing water to pass directly through, thereby reducing the runoff from a site and allowing groundwater recharge.

Project: RAINWATER COLLECTION — RAIN BARRELS

Team Members: Lynnee Jacks
School: Antelope High School

Description: Integrate rainwater collection into the school's garden and compost system with the addition of rain barrels. Rain barrels collect and store water from the roof that would otherwise add to runoff and enter storm drains and streams. Water stored can be used for garden needs, thereby conserving water for other needs.

Project: LANDSCAPE FOR WATER CONSERVATION

Team Members: Jennifer Pulido, Gabrielle Garcia
School: Colusa High School

Description: Implement a landscaping project on school campus with native, drought-tolerant vegetation. Project would demonstrate the use of native species that require less watering, and do not need fertilizers and pesticides, thus addressing issues of water quantity and quality.

Project: ECO-FRIENDLY SHOWERHEADS

Team Members: Dimitri Moua
School: Mira Loma High School

Description: Replace old showerhead with a water-efficient model and collect data on the water- and cost-saving benefits. Communicate these benefits through social media to encourage others to switch and track community water savings. Eco-friendly showerheads may reduce water consumption by 30 percent or more.

Project: AUTONOMOUS SOLAR-POWERED BOAT FOR ALGAE CONTROL

Team Members: Julie Fukunaga
School: Tokay High School

Description: Provide an innovative alternative to using chemicals for algae control in small water bodies. Algal blooms are caused by overload of nitrogen and phosphates into an aquatic system. The rapid increase of algae and subsequent decay can result in hypoxic conditions and potential fish kills.



Project: WATER CONSERVATION EDUCATION

Team Members: Judy Phu, Asia Xiong, Jamilah Ahmach-Antolin
School: Valley High School

Description: Initiate a water conservation education program in school. Develop and deliver water lessons in advocacy classes and host a water conservation booth with engaging activities at the high school health fair, which is well attended by students and community members of all ages.

Project: FINS AND FARMS

Team Members: Nicholas Moresco
School: Colusa High School

Description: Educate farmers on the use of flooded rice fields as places to raise salmon smolts in an effort to bring the project to the local community. Seeks to expand the successful Knaggs Ranch project by explaining the process and benefits to local farmers, and ultimately to increase winter/spring run salmon populations.



HONORABLE MENTIONS:

BOXES FOR BEES

Jack Gumbiner, Noah Crockette, Jacob Reynolds, William Neves (The MET Sacramento)

PLANTING SEEDS FOR THE NEW NORMAL

Blythe Newton-Haynes (Rio Americano High School)

INVASIVE SPECIES REMOVAL DAYS

Tristan Trillo (Christian Brothers High School)

BIOTECH FLOATING ISLANDS

Samantha Patten, Edwin Contreras, Harman Dhatt, Olivia Wilburn (Stockton Collegiate)

URBAN RUNOFF

Alaysha Gonzalez, Jacqueline Choudhuri-Coe, Andrew Sanford, Chris Carter (DaVinci High School)

WASTE FREE LUNCHES

Marlena Phan (William Daylor High School)

PROJECTS IMPLEMENTED TO DATE

Antelope High School:

- Recycling Bins on Campus
- Pollinator Garden
- Sierra Creek Oak Planting
- Reusable Bags — distribution and education
- Campus Landscape: Replace non-native roses with native plants
- Compost System

William Daylor High School:

- Building Recycling Bins
- Drip Irrigation/Solar Powered Pump — water catchment system

Colusa High School:

- Monofilament Recycling Containers — placed at Sacramento River Boat Landings
- Owl Boxes — built and placed on farms

Da Vinci High School:

- Native Plant Pollinator Garden

Florin High School:

- Water Efficient Landscaping/Planter Boxes

Stockton Collegiate High School:

- Salmonids in the Classroom — raising salmon in class for release to river

Christian Brothers High School:

- Wildlife Habitat Restoration

Valley High School:

- School Composting

Mira Loma High School:

- Himalayan Blackberry Removal/Restoration

Field WORK

Teacher asks students to address real-life concerns

by Michelle Carl



Current students from Craig Richards' class recently installed owl boxes at a farm near Colusa. The owls will hunt mice and rats, thus reducing the need for rodenticides. Photo by Melanie MacTavish

For Craig Richards, science is best taught outside the classroom.

Richards, a biological sciences teacher at Colusa High School, says that's why his students have participated in the Caring for Our Watersheds contest since its inception.

Environmental science is an integrated science, meaning it involves many different disciplines, from chemistry and biology to economics and sociology.

"It's problem solving and it's excellent for kids to learn about by doing investigations into local problems," he says.

Many of the projects done by Colusa High School students have involved the local riverbank habitat. Projects have included improving erosion control, establishing fishing line recycling receptacles and organizing clean-up efforts.

To come up with the projects, Richards will sometimes read about a local issue and plant an "idea seed" with the students. Students will then brainstorm solutions and work with mentors to write a proposal.

A finalist project from the 2013 contest had students addressing a problem with controlling the rodent population. Using rodenticide makes mice and rats "act silly" before they die, Richards

"I've always been a proponent of getting my kids out into the community ... and learning about their world and what their role in it will be."

Craig Richards
teacher

explains. This makes them a more likely target for predators, usually raptors. Because predators are eating so many of these poisoned rodents, they are at risk of dying.

So what solution did they come up with? Former students Ruby Dunham and Kyle Cervantes wrote a proposal to have owls take over the rodent control. Creating a nesting box for the owls encourages them to move in and

start hunting the mice, thus reducing the need for rodenticide and creating a win-win for farmers and the environment.

Students got help from the school's shop teacher and a local cabinet maker to assemble the boxes. Funding for the boxes was provided by MorningStar Farms, which recently installed the boxes at a grower's ranch.

Seeing projects implemented in the real world reinforces what Richards loves about his students participating in Caring for Our Watersheds.

"Life lessons are stronger outside the classroom," he says. "So I've always been a proponent of getting my kids out into the community and connected to people other than just teachers, and learning about their world and what their role in it will be."

COME Together

Student increases the effort to remove invasive plant

by Mike Blount

Along Arcade Creek in Sacramento, the Himalayan blackberry bush is spreading by out-competing native plants for resources. The aggressive evergreen has a large root system that sucks up a lot of water, and it grows quickly, overshadowing everything underneath it. But one Mira Loma High School student is bringing together volunteers to give the native plants a fighting chance.

Through the Arcade Creek Project, a student-run program to monitor and protect the health of Arcade Creek, students at Mira Loma High School regularly visit the area to remove invasive species and replant native ones. But Preethi Raju recognized that more hands were needed to keep up with the ever-encroaching Himalayan blackberry bush.

Raju wrote a proposal for a project to increase the number of student

volunteers by recruiting students from other high schools in the area. The project, "Goodbye Invasive Species," was chosen as a finalist for the 2013 Caring for Our Watersheds contest. As a result, more than 20 students joined the effort to help remove the non-native plant.

"I love the feeling of being out in nature and working together."

Preethi Raju
Caring for Our Watersheds
finalist

Her teacher, Colleen Kelly, says she was impressed with Preethi's passion.

"It inspired her to write a great proposal and motivate a group of students to go out with her, and I've always been really impressed with

Preethi and her ability to get things done," Kelly says.

Once every two weeks, students who volunteer for the project don gloves and work clothes to uproot the bushes by hand, one by one, for three hours at a time. The Himalayan blackberry bush is especially hard to remove because it has thorny branches and its roots lie deep in the ground. Despite those challenges, Preethi and student volunteers on the project have removed more than 15 percent of the bushes from Arcade Creek. Preethi says she is happy with the progress, but there is still more work to do.

"I love the feeling of being out in nature and working together," Preethi says. "Even though we're sweating and sometimes get cut with thorns, it's worth it to see the blackberry we've cleared out at the end."



Preethi Raju's project "Goodbye Invasive Species" brought together students from several local high schools to remove the non-native, invasive Himalayan blackberry bush from Arcade Creek. Photo by Louise Mitchell



photo courtesy CLBL

PARTNERS *In Education*

Organizations dedicated to creating the next generation of land stewards in California

Both Agrium and the Center for Land-Based Learning understand the importance of protecting our watersheds and conserving natural resources. But it's equally important to cultivate future land stewards and tomorrow's advocates for the environment. That's why both organizations have partnered together to establish Caring for Our Watersheds: California, a unique program that enhances classroom learning through the practice of environmental research,

writing skills, public speaking, and hands-on stewardship. The program, which is funded by Agrium and run by the Center for Land-Based Learning, asks high school students to propose ideas on how to improve local watersheds. Students with strong proposals will then have the opportunity to put those ideas into action. As projects are planned and implemented, students develop valuable leadership skills, learn sustainable practices and contribute to creating a

healthier ecosystem. Students also have opportunities to connect with agricultural and environmental professionals who volunteer and mentor the students as they learn new skills and develop deeper connections with the community they live in. Caring for Our Watersheds is open to all high school students who live in the Sacramento-San Joaquin watershed in Yolo, Solano, Sacramento, Colusa, Yuba, Sutter, Glenn, El Dorado, Placer, and San Joaquin counties.

Center for Land-Based Learning

- Dedicated to creating the next generation of farmers and teaching California's youth about the importance of agriculture and natural resource conservation.
- Engages students and community in its programs:
 - **SLEWS** (Student and Landowner Education and Watershed Stewardship)
 - **FARMS Leadership**
 - **GreenCorps**
 - **California Farm Academy**
- Programs emphasize hands-on learning, sustainable practices, and leadership.
- Creates connections to agricultural and environmental careers.



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www.LandBasedLearning.org

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- Provides nutrients, agricultural products, and services around the globe.
- Believes that helping to increase food production responsibly means doing so in ways that protect the environment, support economic vitality, and enhance communities.
- Started Caring for Our Watersheds in 2007 by partnering with local organizations who run the program. Locations now include Canada, the U.S., Australia, and Argentina.
- Offers other educational tools, interactive exhibits, and websites including Growing the Next Generation and Seed Survivor.

www.Agrium.com/Sustainability

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2014 PARTICIPATING TEACHERS AND SCHOOLS

Aart Dewaard – George Washington Carver High School
Bekah Rottenberg – DaVinci High School
Chris Chu – The MET Sacramento
Colleen Kelly – Mira Loma High School
Craig Richards – Colusa High School
Cristina Goucher – Stockton Collegiate International School
Danny Delgado – Christian Brothers High School
Erna Piper – William Daylor High School
John Grima – DaVinci High School
Joyce Dibble – Rio Americano High School
Katie Cantrell – Antelope High School
Ken Steele – Valley High School
Rochelle Jacks – Mira Loma High School
Sandra Starr – Tokay High School

2014 JUDGES AND VOLUNTEERS

Al Colombano – Retired Science Teacher
Alex Klein – UC Davis Graduate Student, Ecology
Amy Talbot – Regional Water Authority
Brian Brown – Project WET, Water Education Foundation
Charmaine Boulmay – Sacramento Splash
Dan Welsh – U.S. Fish and Wildlife Service
Debbie Pattison – UC Berkeley Conservation Graduate
Farah Wissinger – Environmental Sustainability Manager
Hunter Merritt – U.S. Army Corps of Engineers
John Killey – Environmental Specialist, Agrium
Jordan Power – CA Assn. of Resource Conservation Districts
Joshua McCabe – Utility Forester, ACRT
Joy Cookingham – UC Davis Graduate Student, Ecology
Karleen Vollherbst – U.S. Fish and Wildlife Service
Katherine Wood – UC Davis Ecology Graduate
Kayla Burns – UC Davis Graduate Student, Soils
Michael Anderson – Engineer, Agrium
Michelle Robinson – CA Department of Water Resources
Mike Dunphy – U.S. Fish and Wildlife Service
Phil Romig – Sacramento Co. Office of Education
Rebecca Ford – Retired College English Instructor
Sara Enders – UC Davis Graduate Student, Soils
Trina Camping – UC Davis Soil Science Graduate
Vicki Sacksteder – San Juan Water District