

Energy Education

Supporting educators in our community and nurturing student interest in science, energy, and environmentalism

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Youth Energy Summit January, 2014

More than 120 students gathered at SMUD to learn to use art to communicate living well while conserving energy. The theme of the sixth annual Youth Energy Summit (YES) was the “Art of Being Green”.

YES created an all-encompassing forum for local students and teachers to discuss sustainability through technology

and energy conservation and efficiency. At the summit, students learned to incorporate art and creativity to communicate the benefits of comfortably living a green lifestyle.

Students toured the SMUD campus and learned about electric vehicles, solar technology, green building design, **YES** *continued on next page*



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waste management, and water conservation. Several hands-on activities supported the presentations including having the students build their own personal, solar-powered phone charger.

The Friday's keynote speaker, **Sayaka Ganz** (sayakaganz.com), exhibited her art work which uses discarded plastic to create beautiful, living pieces of art. She also taught the students the art of Furoshiki and they learned how to make a piece of cloth magical. Saturday's keynote speaker, **AshEL** (earthamplified.com/about) showed how music and videos can become powerful tools in communicating complex themes.

The YES students were asked to design and implement community service learning projects which will then be displayed on the north steps of the State Capitol on April 25. Their exhibits will be open to the public from 11:00 a.m. – 12:00 p.m. The students will then be interviewed by judges and awarded scholarships.

YES is sponsored by SMUD, Roseville Electric, Lodi Electric Utility, Turlock Irrigation District and coordinated by Sacramento State's LegiSchool Project. More information is available at smud.org/en/residential/education-safety/teachers-and--students/classroom-resources/youth-energy-summit.htm •



Above: Sayaka Ganz, Left: Students from the 2014 YES event, Below: AshEL



2014 YES event.



Water, water...everywhere. NOT

In spite of the last minute rains, California remains in the grip of a drought, and the recent rains did little



more than change the landscape from brown to green in much of the state. Our major reservoirs remain well below historical average capacity for this time of year at 40% to 50% of capacity, snowpack is at 28% of normal and disturbing reports have been coming out regarding groundwater levels throughout the Central Valley. The ramifications have been building since Governor Brown issued a drought declaration in January as several California communities are facing the depletion of their water supplies; both the Federal and State water projects announced there would be zero water allocations this year if drought conditions persist and the same climatic variables driving the drought has driven a three-fold increase in the number of fires CALFIRE has battled since January. California — and each of us as citizens of this state — is facing some tough decisions regarding the immediate and long-term future of our water resources.

Teachers, the drought presents a unique opportunity to engage students in a current and real world discussion that will impact their future as Californians. To find lessons which will be connected with Common Core and Next Generation Science Standard elements, Project WET (Water Education for Teachers) provides a portal as well as opportunities to register for teacher training. (see E&TC listing for Project WET).

To register for a Project WET workshop or for more information, contact Brian Brown projectwet@watereducation.org



Here are useful water conservation links

The U.S. Drought Portal • drought.gov

The National Integrated Drought Information System (NIDIS) provides a clearinghouse of drought-related information including maps, tools, and information to help

people prepare for and mitigate the effects of drought. The California NIDIS Pilot is developing and demonstrating a variety of early warning information resources and strategies, in partnership with agencies, industries, institutions, tribes, and other major stakeholders.

www.drought.gov/drought/regional-programs/california/california-home

Summary of Estimated Water Use in the United States • <http://pubs.usgs.gov/fs/2009/3098>

The USGS compiles and estimates water-use information in cooperation with State, Federal, and local agencies to document how the Nation's water resources are used. The most recent publication in the series is from 2005, but is in the process of being updated and expected to be released in Fall 2014. This fact sheet integrates well with – and adds an additional Common Core and Next Generation Science standard element to - the Project WET activities 'A Drop in the Bucket', 'Choices and Preferences,' 'Virtual Water,' and '8-4-1, One For All.'

HomeWaterWorks: Calculator • home-water-works.org

Want to conserve water? Not sure where to start? Our Water Calculator quickly estimates how much water your household uses and compares it to a similar average and a highly efficient home. The Water Calculator also shows you where to begin your home water conservation efforts. Throughout Home Water Works, you'll find useful tips and resources for saving water and money without sacrificing comfort or convenience.

H2O House Water Saver Home • h2ouse.org

Take the virtual home tour to investigate your water saving opportunities in each area of your home. Click on each location to show you both the facts and specific advice. Visit the virtual encyclopedia of water conservation information for your home and select the area of the home where you are interested in learning more about saving water, including leak detection and repair, water use efficiency in and outside the home, and incentive or rebate programs available to you: h2ouse.org/action/index.cfm

Be Water Smart • bewatersmart.info

This website provides information on drought status,

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rebates, conservation workshops and interactive maps to help customers in the Sacramento region link to their water provider. Many local water providers offer rebates to replace older fixtures and appliances, such as toilets and clothes washers, with high-efficiency models. Check to see if your water provider is offering similar programs! <http://www.bewatersmart.info/why- conserve-water/preparing-for-a-dry-2014>.

Save Our Water • saveourh2o.org

Save Our Water is a statewide program aimed at helping Californians reduce their everyday water use. Browse the Save Our Water website to uncover ideas on saving water indoors and out. You'll find water conservation tips, tools for calculating your water use, fun ways for kids to save water and to permanently reduce water use – regardless of whether California is in a drought. <http://www.saveourh2o.org/node/2>

School Water Audit Project • <http://cals.arizona.edu/arizonawet/teachersupport/swap>

Start a School Water Audit today! Developed by the Arizona Project WET program, the School Water Audit Project combines water education with practical applications of scientific methodology. It brings community members together with students for the purpose of accomplishing a unified goal. It empowers students and adults alike to be responsible water stewards. Download the SWAP lessons individually by clicking on the download option inside your lesson bubble. SWAP water waste for water efficiency!

USGS Water Science School: Home Use • <http://ga.water.usgs.gov/edu/sq3.html>

How much is your daily indoor water use? How much water do you use when you take a shower? Wash a load of clothes? Flush a toilet? Even brush your teeth? Enter your use data from the Project WET 'My Water Footprint' or 'Water Audit' activities, choose the submit button, and we'll give you an estimate of how many gallons of water you used. NOTE: Our survey here is very general, designed just to give you a quick idea of your water use, but we have links to more accurate calculators on this page!

USGS Water Science School: Drip Calculator • <http://water.usgs.gov/edu/sc1.html>

How much water does a leaking faucet waste? Check your faucets at home — do any of them drip? Well, maybe it's just a small drip — how much water can a little drip waste? This page allows students to enter their data from the Project WET 'Money Down the Drain' activity to help calculate the volume of water being lost, while also providing wonderful questions and links to pique their water conservation curiosity!

USGS Water Science School: Virtual Water • <http://water.usgs.gov/edu/sc1.html>

What is the water content of things? Water is needed to grow not only everything we eat but also to produce almost all the products we use every day. You can't tell by the size of a product or the appearance of a food how much water was actually used to produce the item. This page allows students to enter their guess on how much water is used to produce some common foods and products and is a wonderful website to use with the Project WET 'Virtual Water' activity!

California Data Exchange Center • <http://cdec.water.ca.gov>

California Data Exchange Center (CDEC) installs, maintains, and operates an extensive hydrologic data collection network, including reservoir storage, snow data, weather, and total precipitation data. CDEC provides a centralized location to store and process real-time hydrologic information gathered by various cooperators throughout the State; and then disseminates this information to support forecasting and flood operations activities and to meet the data reporting needs of various cooperators, public and private agencies, the news media, and the public.

Bay Delta Conservation Plan • <http://baydeltaconservationplan.com>

The Bay Delta Conservation Plan (BDCP) is a part of California's overall water management portfolio. It is being developed to secure California's water supply by building new water delivery infrastructure and operating the system to improve the ecological health of the Delta.

WaterSense • epa.gov/watersense

WaterSense, a partnership program sponsored by the U.S. Environmental Protection Agency, makes it easy for

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Americans to save water and protect the environment. Visit the website to get water-efficiency information and tips, learn how to check for and fix leaks, and more. Many WaterSense materials are available in Spanish, and the website includes a For Kids section and a “Test Your WaterSense” game.

Sprinklers 101 • aveourh2o.org/content/more-resources

Water for our yards and gardens can account for up to 60% of home water use. Sprinklers 101 is a one-stop shop for homeowners looking for easy-to-understand information about how residential sprinkler systems work, information on drip irrigation and other smart ways to reduce

landscape water use, as well as learn how to save water outdoors simply by changing the way you water your plants. <http://www.saveourh2o.org/content/homeowners>

Greywater Action • <http://greywateraction.org>

We are a collaborative group of educators, designers, builders, and artists who educate and empower people to build sustainable water culture and infrastructure. Using water from sinks, showers, and washing machines to irrigate plants is a way to increase the productivity of sustainable backyard ecosystems that produce food, clean water, and shelter wildlife. We also have information on rainwater harvesting. •

Science Olympiad

The Science Olympiad, which celebrates its 30th anniversary this year, is one of the largest and oldest science competitions in the country. Middle and high schools form teams of 15, with students competing in 23 different events in physics, chemistry, earth space science, biology and engineering.

The school squads advance through competing in local, regional and state tournaments, with the top 120 teams invited to the national competition. Last year, Mira Loma High School was edged out by Palo Alto High School for the coveted invitation. However, this will be Winston Churchill’s fourth consecutive trip to the national Science Olympiad.

Regionally —

B Division:

- 1st place: Winston Churchill MS-A
- 2nd place: Rolling Hills MS-A
- 3rd place: Winston Churchill MS-B

C Division:

- 1st place: Mira Loma HS-A
- 2nd place: Sheldon HS
- 3rd place: Bella Vista HS-A



NorCal —

(B Division) Mira Loma High School and (C Division) Winston Churchill Middle School both took top honors in their divisions at the event, which was held at California State University, Stanislaus.

The two teams will move on to the Science Olympiad National Tournament, which will be held May 16-17 at the University of Central Florida in Orlando this year. •

We Need Solar Champions

Interested in promoting solar energy technology at your school? Apply to become a SMUD Solar Champion! We'll set you up with classroom instruction, free giveaways, a Solar Schoolhouse classroom kit, and a Solar Schoolhouse fountain kit.

Get started by attending a Solar Schoolhouse Primer workshop, August 23

This six-hour workshop will demonstrate solar technology and provide curriculum ideas including solar activities for your classroom. If you teach at any school in SMUD's service area, this workshop is for you. Parking is free, and breakfast and lunch will be provided. Sign up today by emailing SMUD's Energy & Technology Center at ETCmail@smud.org. Seating is limited.

Solar Schoolhouse Classroom kits

To receive a Solar Schoolhouse Classroom kit, write a lesson involving how you'll use the kit. Please use the format provided by SMUD's Energy & Technology Center. Once we approve the lesson plan, you can pick up your kit. To receive a Solar Schoolhouse Solar Fountain kit, please design and implement a 45-minute in-service instruction for teachers at your school. The lesson plan will become public domain. •



Scholarships for teachers still available

**2014 Solar Schoolhouse Summer Institute for Educators
June 22 - 27, 2014**

Teachers attending the 2013 Summer Institute display their solar projects.

Educators attending this summer seminar will learn about the science and history of heating, cooling, and powering our homes with the Sun. Participants will build solar cookers, model passive solar homes, solar electric fountains, a solar powered emergency kit, conduct energy audits - and tailor lessons for your classroom situation. We will conduct the seminar at recently built Rarus Institute, a solar powered facility & workshop powered with alternative energy sources. In addition to learning the science of proper building design (e.g. thermodynamics, electricity, seasonal changes) and how to fit these exercises into your

curriculum, participants will walk away with practical knowledge that they can apply in their own lives. Integrating solar energy education into your curriculum can provide an element of excitement and hope for the future.

The Energy and Technology Center will provide scholarships for 3 area teachers to attend the Summer institute. If you would like to be considered, please email your request and a short essay describing how you will use solar in your classroom to: tor@rahus.org. •

Save The Date

Northern California Solar Regatta May 16 and 17, 2014 10 a.m. – 3 p.m. • Rancho Seco, Herald, CA

This event is open to the public so bring a picnic basket and come and learn about solar energy while cheering on your favorite team.

The North American Power Boat Association will be exhibiting some demonstration trials. While you are there, take a turn at casting for fly fishing, try paddle boarding, and look for some of the bald eagles who call the park their home.

Twenty-two middle and high school teams will be competing on Friday. The winner will go on to compete again on Saturday against 11 college teams. The winner of each day will take home the coveted Regatta Cup.



Pictured 2013 Solar Regatta Champions from Elk Grove H.S.

Electricity Fair Saturday, September 6, 2014 10 a.m. – 2 p.m. • Folsom Powerhouse Museum

Come and visit the historic powerhouse – which opened in 1885 – and spend a day with the family in a beautiful setting by the American River. Learn about power generation, electricity, and renewable resources with tours, workshops, and hands-on activities. Radio Disney will be there with lots of fun activities for kids.



The E&TC offers free curriculum and a solar newspaper supplement which teaches about electricity through solar power. We can also send you a class set scavenger hunt which can be used at the State Park to earn special prizes for the children. The teacher sending the most students to the event will receive a classroom solar kit. The Scavenger hunt is written for the 4th grade but can be used by any interested classroom. Email Suzette.Bienvenue@smud.org for a class set of Teaching Solar: Your Solar Home and the Electricity Fair Scavenger Hunt.

Fall Workshops for Teachers

All of these workshops are free of charge, offer curriculum and class materials, parking is available and meals are served. Call or email the Energy & Technology Center for more information or to register. Seating is limited. (916) 732-6738 ETCmail@smud.org.

Solar Schoolhouse Primer: Workshop for Educators (Grades 4-12+)

Saturday, August 23, 2014 • 8:30 a.m. – 3:30 p.m.

In this workshop, Tor Allen, from Solar Schoolhouse, will show you how to easily integrate solar energy education into your existing curriculum while teaching students the value of using renewable energy sources. You will receive hands-on classroom activities correlated to the California content standards, a teacher guide, solar science supplies, as well as first-hand experience building solar powered devices for your classroom. Learn how you, too, can become a Solar Champion.



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GEMS® Electric Circuits (Grades 4-8)

Saturday, September 20, 2014

8:30 a.m. – 3:00 p.m.

Folsom Powerhouse Museum

Electric Circuits is highly recommended for Grade 4 teachers as a student introduction to electricity and electric circuits. Davin Bowker of the San Juan Unified School District will lead educators through activities in which they will learn presentation strategies; explore, build and compare simple, closed, series, and parallel circuits; learn about short circuits; investigate the role of batteries, resistance, conductors, and insulators; create their own electrical inventions; and learn how to draw schematic diagrams. Teachers will tour the museum and the historic Folsom Powerhouse.



Project WET | Common Core and EEI (Grades K-12)

Saturday, October 11, 2014 • 9:00 a.m. – 4:00 p.m.

Effie Yeaw Nature Center



Celebrate Earth Science Week as you experience interdisciplinary activities to engage students in learning about water resources, water conservation, and key related science concepts. Engage in fun, hands-on, standards based outdoor activities including an introduction to water quality monitoring with U.S. Geological Survey staff. This is STEM learning at its best. Participants will receive the new, Common Core Correlated Project WET 2.0 Guide. Lunch will be provided.

GEMS® Dry Ice Investigations and Chemical Investigations (Grades 5–12)

Thursday, October 16, 2014 • 4:00 p.m. – 7:00 p.m.

Folsom Powerhouse Museum

This workshop will focus on science investigations and will help teachers develop the skill to foster inquiry abilities, which research has shown is very difficult to teach. Students will learn that science is about wondering why, asking questions, observing, and coming up with possible explanations before designing investigations to test the explanations. In the morning, teachers will work with dry ice to investigate the particulate theory of matter, phase change, and chemistry. In the afternoon, an ordinary zip-lock bag becomes a safe and spectacular laboratory as teachers learn how to mix chemicals that bubble, change color, get hot and produce gas, heat, and color. This section will review chemical changes, endothermic and exothermic reactions, and will help support skills in observations, experimentation, and inference.

