



California Project WET Gazette

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Choices and Preferences in a Time of Drought

The world outside my home office window in the foothills of the Sierra Nevada is a sea of green quilted with brilliant patches of wildflowers like the shards of a shattered rainbow come to Earth on this St. Patrick's Day. It is hard to believe California is in the grip of a withering drought once more, as the scent of new mown grass heavy with dew fills the air. If one simply turned off the news and laid their head in the grass, all would seem right in the world – no drought, no more fire danger and no need to heed warnings to conserve water. But it'll take more than wishful ignorance and a four-leaved shamrock to get us through the upcoming summer. California remains in the grip of **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.

Water conservation in all sectors is the immediate priority and involves actions that can be taken by citizens of all ages and integrated into the classroom. An educator attending a recent advanced Project WET training noted in addition to having her students do the activity, she had assessed her own home water use using the *'My Water Footprint'* (p: 441) meter and was horrified at the actual amount of water being used. She ended up conducting her own version of the Project WET *'Water Audit'* (p: 469) activity and ended up replacing outdated toilets, changing landscaping and installing drip irrigation, saving a lot of water and reducing her monthly bills in the process. *'The Long Haul'* (p: 273) is a wonderful activity for physical education that takes students back to the days before plumbing to appreciate the amount of water they use in the present. *'Water Concentration'* (Project WET portal) is a history activity, where students analyze different water use practice technology through time for the home to assess the benefits and costs in time, energy, water and other natural resources used in each. Math skills are applied to water conservation in *'Money Down the Drain'* (p: 351), as students measure and calculate water volume lost by a variety of leaks and convert those volumes into the units used on home water bills to calculate the actual costs of each leak if left unfixed for given periods of time. *'Easy Street'* (Project WET portal) brings language arts, math, history and environmental science together in an activity that has students

comparing water used by their family with one in the late 1800s American West – the student pages are titled '[Drought Days Simulation](#).'

Taking action to secure and determine the course of California water supply management in the future is the other major priority this spring. California citizens have until June 13th to review and comment on the [Bay Delta Conservation Plan](#) (i.e., 'the tunnels'). Water allocation is at the core of the debate over the plan as it ever has been in California water politics and a number of Project WET activities, which present hypothetical situations that are anything but in California. For Secondary teachers, this presents a unique opportunity to engage students in a current discussion that will their immediate future as Californians, while providing you with an opportunity to dig into the details of the BDCP with a course of study loaded with Common Core and Next Generation Science Standard elements. '[Choices and Preferences](#)' ([Project WET portal](#)) will let you quietly rank the importance of major water user categories alongside your students, then see how you compare as they discuss, debate and refine their rankings with the rest of the class. Then dig into a class reading and review of the overview materials on the BDCP website – What are the stated purposes of this plan? How well does the plan support the water user rankings of the class in the Project WET activity? The activity '[8-4-1, One For All](#)' (p: 299) will have your students digging deeper into the BDCP plan as they investigate the water needs and become a representative for one of eight water user categories: [agriculture, energy, municipal, business & industry, fish & wildlife, recreation, navigation and Earth systems](#) (i.e., aquifers, vernal pools, the Delta). Extend the activity by having students investigate each water user category by California region – i.e., Northern California, Delta and San Francisco Bay Area, San Joaquin Valley and Southern California – and creating a 'common water needs' table - like the one on [page 302 in Project WET Guide 2.0](#) – for each region. The tables will allow the class to compare the make-up of each water user category by region to better understand how they may view the Bay Delta Conservation Plan. The [BDCP website](#) includes an archive of public comments that have been received and [Aquaformia](#) includes a news file on the BDCP and links to representatives making up the water user categories in the Project WET activity. The above Project WET activities and study of the Bay Delta Conservation Plan will require students to integrate and apply what they have been learning in classes ranging from civics and biology to language arts and environmental science!

While a study of the Bay Delta Conservation Plan would be well over the heads of younger students, Project WET provides 'building block' activities to help build concepts, knowledge and skills in younger students. '[Choices and Preferences](#)' is a broad grade range activity that includes adaptations for use in the Primary grades and is an activity that dovetails well with '[Common Water](#)' (p: 249), which demonstrates water as a shared and finite resource- a concept that is often hard for adults to remember. The concept is further reinforced through the use of math and measurement skills in the activity '[A Drop in the Bucket](#)' (p: 257), where students breakdown the estimated global allocation of water and water use in the United States using U.S. Geological Survey data. The two-page [USGS Fact Sheet: 'Summary of Estimated Water Use in the United States in 2005'](#) referenced in '[A Drop in the Bucket](#)' is an easy read for anyone with an upper elementary reading level and illustrates California water use in comparison to other states by major water user categories. Each of these activities include K-2 options that pare down and bring the choices and content closer to home for lower elementary students – and as with the Secondary activities, each of these activities have students using integrated knowledge from multiple subject areas to hone critical thinking skills directly tied to Common Core and Next Generation Science Standards.

Recurring drought is a fact of life in California along with our Mediterranean climate and is projected to occur with more regularity as our climate continues to change. While the Project WET activities above will start your investigations of drought and water allocation issues with students, the '[Websites of Interest](#)' below will provide additional resources to help take action at school and at home. Hope you have a wonderful – and with any luck – a wet Spring!

WEBSITES OF INTEREST

The U.S. Drought Portal

<http://www.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. <http://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

<http://www.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. *My Water Footprint*

H2O House Water Saver Home

<http://www.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: <http://www.h2ouse.org/action/index.cfm>

Be Water Smart

<http://www.bewatersmart.info>

This website provides information on drought status, 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

<http://www.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 in nature...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. The Draft BDCP and BDCP Draft EIR/EIS are being made available to the public for a 180-day review period (including a 60-day extension). *The public review and comment period is effective December 13, 2013 through June 13, 2014.* <http://baydeltaconservationplan.com/PublicReview.aspx>

University of California Institute for Water Resources

<http://ciwr.ucanr.edu>

The Institute integrates California's research, extension, and education programs to develop research-based solutions to water resource challenges. We do this by facilitating collaborative research and outreach on water issues across California's academic institutions, governmental agencies, and nonprofit organizations. The site contains links to drought resources, publications, and educational materials.

WaterSense

<http://www.epa.gov/watersense>

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

<http://www.saveourh2o.org/content/more-resources>

Welcome to Sprinklers 101! 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.

DIY Plumbing Advice

<http://diyplumbingadvice.com>

Do-It-Yourself Plumbing info you can actually use! DIY Plumbing Advice strives to provide you with plumbing and water information that is reliable, responsible, and free. The purpose of this site is to show *YOU* how to do it, not just to show an abbreviated video of how I did it. A plumbing glossary is included on each subject page. The site was developed by Greg Chick, a certified Green Plumber in Ramona, CA. Learn more about Green Plumbers at: <http://www.greenplumbersusa.com/what-is-a-greenplumber>.

If you would like more information on Project WET please contact Brian Brown, California Project WET Coordinator at: projectwet@watereducation.org or (916) 444-6240.

Check our website www.watereducation.org and/or contact us for updates.