



California Project WET Gazette

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ARTICLES

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My Water Address, Take Action!

“California is burning - What the hell are you going to do about it?” – Gov. Jerry Brown

The late August news headlines on the state of California are like a surreal juxtaposition of 1960s monster movies with Governor Jerry Brown channeling the sentiment of the 1976 film ‘Network’ in his open challenge to the small army of Presidential hopefuls, but what else would one expect in the state that calls Hollywood home? Unfortunately, it is no laughing matter. As we enter the Fall of 2015, California is a garish scene of depleted reservoirs and vast acreages of our forested watersheds are withered by four years of drought, rapidly dying from epidemic beetle attack or burned to a crisp by wildfires that explode in size and with an intensity not even Godzilla could muster. Add to this a July that saw a foot of snow falling in Yosemite, an I-10 freeway overpass washed out by flash flooding and a steady stream of reports that one of the potentially strongest El Nino events in recorded history is likely to steer ‘atmospheric rivers’ of water over large portions if not all of California this Winter – IF it is not deflected by ‘The Blob’ and its ‘Ridiculously Resilient Ridge.’ It all sounds unbelievable - like the script for a very bad z – grade movie - if we in California weren’t living it. So what is one to do in the face of so much doom and gloom?

We can start by taking better stock of our surroundings and benefiting from the knowledge to be gained for our own safety as well as discovering the wonderful educational opportunities available in doing so for California citizens of all ages. A good start is the Project WET activity, *‘My Water Address, Take Action!’* (p: 433). The activity begins with a series of questions to better understand where one lives, helping steer students and adults alike in learning about the unique characteristics of where one lives and works in relation to potential natural hazards. The investigation leads one to find out in more detail where their home or school is in relation to local water bodies, the topography of the watershed, dry stream and flood control channels, the history and current state of those channels and the role of weather and climate in determining local risk. The California Emergency Management *‘My Hazards Map’* website is a great, easy to use tool to help start this investigation. However, unlike news stories that leave one hanging in doom and despair, the Project WET activity guides one in how to use this knowledge to create an action plan and prepare a ready to go emergency pack. Though the activity focuses on flood risk, the awareness and planning is very similar in preparing for all potential disasters.

The questions posed in *‘My Water Address, Take Action!’* provide an excellent opportunity to engage students in more in-depth learning. Understanding how a watershed is defined and learning simple techniques to delineate watersheds on different types of maps in the activity *‘Seeing Watersheds’* (p: 187) provides students with the basic knowledge and skills to delineate their own watershed, understand the relationships between topography and stream channels and be able to analyze the map for evidence of potential risk factors near their home or school – and create a map of likely safe routes to avoid the risks in an emergency that can be included in their action plan and emergency packs. Some of this knowledge can be brought down to a more tangible level for younger and older students alike in the activity *‘Rainy Day Hike’* (p: 169), where students are generating maps of the school yard and using evidence to predict flow patterns and potential water quality hazards, followed up by an investigation of actual flow patterns following a storm event and water quality hazards carried by storm flows. The focus on a concrete investigation of potential school-yard water quality hazards (i.e., litter, sediment, parking lot fluids, etc.) in *‘Rainy Day Hike’* opens the door for student action to reduce or eliminate some of these non-point

source pollution hazards through a campus clean-up event in support of the annual [Coastal Clean-up Day](#) and Coast Weeks events!

'[My Water Address, Take Action!](#)' questions regarding the history of past weather and climate of a location can be studied through an extension of the original Project WET guide activity '[Wet Vacation](#)' ([Portal](#)), having students apply the activity to the study of weather and climate of California regions. Raw precipitation and temperature data throughout the nation can be obtained by students through the [Regional Climate Centers](#), including California data from the [Western Regional Climate Center](#). To keep the focus on natural hazards, students could create a travel and safety brochure highlighting the natural features of a region, as well as potential hazards and measures travelers can take to stay safe. Past disaster events play a role in assessing hazard risk and the study of past disasters is the focus of '[Nature Rules!](#)' (p: 277). In the '[Websites of Interest](#)' you'll find a website highlighting California's top 15 weather events of the 1900's to get the ball rolling!

What exactly is meant by the reference to a '*100-year flood*'? That is the question posed in the activity '[High Water History](#)' (p: 321), which begins with a simple activity that has helped students and adults understand what is – and is not – meant by the term, as well as the basic statistics involved in the reoccurrences of these events. By the way – flood risk researchers despise the continued use of the term '*100-year flood*' and much prefer the more memorable and technically correct reference '*1-percent annual exceedance probability (AEP)*,' both of which references are discussed in a fairly easy to read [U.S. Geological Survey Fact Sheet](#) that a number of educator use with this activity and older students to add a non-fiction, scientific literature component. The USGS Fact Sheet includes information on factors that change the flood risk probability of streams. Changing land use patterns is high on this list, which is the focus of the activity '[Color Me a Watershed](#)' (p: 239) and another USGS Fact Sheet that can be used with this activity titled '[Effects of Urban Development on Floods.](#)' In '[Color Me a Watershed](#),' students learn simple methods to quantify changing land use patterns in a watershed and calculate the potential change in run-off and water flow volume through time. Of course, this also opens the door to investigating how changing land use patterns may influence risk factors in relation to other hazards – or may be compound in the case of large wildfires that can radically change watershed land use and flow patterns in a short amount of time.

Where your house or school is located in relation to the rest of the watershed is a big factor in assessing hazard risk – and being in a floodplain is an immediate higher risk factor for insurers. Yet, many Californians live in floodplain locations. The Project WET activity '[Back to the Future](#)' (p: 307) uses a real-life scenario and data to engage students in simulating the analysis and pro and con arguments one will often hear in city council and planning committee meetings to decide if and where building can occur in a floodplain. In addition to the historical flow data students analyze in '[Back to the Future](#),' flood risk and potential damage calculations are often part of these discussions. Students learn simple methods for calculating potential damage from different sized floods as part of the activity '[High Water History](#),' which can be brought to bear to add an additional layer of realism and complexity to the discussions in '[Back to the Future.](#)' With the media looking back at the 10th anniversary of Hurricane Katrina, these activities can not only provide students with critical lenses to look back on what may or may not have changed as far as flood risk planning since the disaster, but also how to assess our local flood risk and better inform an emergency preparedness plan.

Halloween may be just around the corner, but education and planning can greatly reduce the fear of a potential nightmare before Christmas one may have by just following news headlines. A few other things to consider is that despite bone-dry conditions for most of the summer and bouts of 100 degree temperatures, Californians have been knuckling down on conservation measures to meet the Governor Brown's 25% conservation challenge. If you haven't already, use the Project WET activity '[Water Audit](#)' (p: 469) to conduct water audit at home and in your school – or to assess the effectiveness of previously implemented, random water conservation efforts. Wildfires and months of atmospheric pollution building up across the landscape are a fact of life in a Mediterranean climate, just as added inputs to that pollution in the atmosphere and trash scattered along the landscape is a consequence of human activity whether accidental or intentional. Find out how you and your students can help learn about these impacts and take action to reduce or eliminate some of these impacts by engaging in a coastal or inland waterway clean up near your school – and the Project WET Gazette archive is filled with past newsletters loaded with ideas on how to use Project WET to study all of the issues above and how students can take action to tackle water conservation and water quality issues at school and home. Check-out the '[Websites of Interest](#)' for some wonderful articles on El Nino, 'The Blob' and resources to integrate with the Project WET activities mentioned in this Gazette. The Fall is also loaded with potential '[Autumn Events](#)' to enjoy, '[Grants, Scholarships & Student Contests](#)' to pursue and a full list of upcoming [Project WET Workshops](#), [Special Events](#), and an array of other '[Professional Development Opportunities](#)'. Hope you have a wonderful Fall!

WEBSITES OF INTEREST

National Preparedness Month

<http://www.redcross.org/prepare/nationalpreparednessmonth>

This September, as part of National Preparedness Month, the Red Cross encourages all Americans to develop a family game plan. How prepared are you? Check out the tips and resources on our website for important information you can use to protect yourself, your family, and your property. Preparedness is a responsibility we all share. Let's do our part. Check-out the California Office of Emergency Services Preparedness Month website too: <http://www.caloes.ca.gov/ICESite/Pages/Preparedness-Month.aspx>

CAL FIRE

https://www.google.com/maps/d/viewer?mid=zp8nK_5H0MFQ.kzTmU5XK-qJQ

The prime California fire season still has several months to go, and burning is already above average. Overall, nationally, 6,290,234 acres have burned in wildfires so far in 2015, well out ahead of average for this time of year. *“Call it climate change, call it just drought, call it a combination of all of that, but we’ve been watching these trends.... Over half of the greatest most damaging fires have occurred just in the last 10 or 15 years, and it’s because of the kinds of conditions we’re being faced with.”* - Ken Pimlott, Director of Cal Fire.

My Hazards Map

<http://myhazards.calema.ca.gov/Default.aspx>

Natural hazards are part of living in California. Use this website to discover the hazards that exist in your area and learn how to reduce YOUR risk! Remember, the best way to recover from disasters is by reducing the risks before a disaster strikes. Having a preparedness kit will help you weather the days after a disaster, but did you know there are steps you can take that may actually reduce the risks of injuries to you and your neighbors and lessen the damage to your home? How To Assemble a Disaster Preparedness Kit: <http://www.fema.gov/media-library/assets/videos/73758>

Do You Know Your Flood Risk?

<http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fas/risknotification/>

The Central Valley is home to more than 1,600 miles of State-Federal levees. In many areas protected by this levee system, the risk of flooding is greater than the risk of fire. Since 1950, flood disasters have been declared in every California county at least ten times, with some counties having as many as 29 state and federal disaster declarations. Reduce your flood risk by being aware and being prepared. Use this site to increase your flood risk awareness and learn practical, easy ways to protect you and your property from costly flood damages.

The Ready Campaign

<http://www.ready.gov>

Ready is a national public service campaign designed to educate and empower Americans to prepare for and respond to emergencies including natural and man-made disasters. The goal of the campaign is to get the public involved and ultimately to increase the level of basic preparedness across the nation. Ready and its Spanish language version Listo ask individuals to do three key things: (1) build an emergency supply kit, (2) make a family emergency plan and (3) be informed about the different types of emergencies that could occur and their appropriate responses.

California Flood Preparedness Website

http://www.water.ca.gov/floodsafe/ca-flood-preparedness/fpw_home.cfm

Precipitation in most of the country varies year to year 10 to 30 percent above or below the local long-term average. In most of California, precipitation varies year to year 30 to 70 percent above or below the local long-term average (see illustration at right). Additionally, California’s physical location makes it subject to three very different types of storm phenomena: the North American monsoon season, storms from the northern Pacific Ocean, and atmospheric rivers.

California Data Exchange Center

<http://cdec.water.ca.gov/intro.html>

The California Data Exchange Center (CDEC) installs, maintains, and operates an extensive hydrologic data collection network including automatic snow reporting gages for the Cooperative Snow Surveys Program and precipitation and river stage sensors for flood forecasting. CDEC provides a centralized location to store and process real-time hydrologic information gathered by various cooperators throughout the State. CDEC then disseminates this information to the cooperators, public and private agencies, and news media.

Community Collaborative Rain, Hail and Snow Network

<http://www.cocorahs.org>

The Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) is a non-profit, community-based network of volunteers of all ages working together to measure and map precipitation. Using low-cost measurement tools, stressing training and education, and utilizing an interactive web-site, our aim is to provide the highest quality data for natural resource, education and research applications. [Click to learn how your class can participate in real hands-on science!](#)

NASA: El Niño

<http://science.nasa.gov/earth-science/oceanography/ocean-earth-system/el-nino/>

One of the most well-known climate patterns that we have come to recognize and better understand is the El Niño. Every three to seven years during the months of December and January, the balance between, wind, ocean currents, oceanic and atmospheric temperature and biosphere breaks down, resulting in a severe impact on global weather. During an El Niño event the trade winds weaken. The region also experiences an extremely higher than average amounts of rainfall.

California's Top 15 Weather Events of the 1900's

Staff at the National Weather Service offices in California have reviewed records of major weather events to affect the state over the past 100 years. Based on impacts to people, property and the economy, National Weather Service has chosen the top 15 weather-related events to impact California, listed in ascending order. You will note that most of the larger events are recent. This is due to the fact that record keeping has improved in the latter half of the century, while urbanization in the state has increased the economic impacts of severe storms and floods. <http://www.wrcc.dri.edu/extreme-events/california>

Project WET Portal

www.projectwet.org

Guide 2.0 educators can download a copy of the '*Water Address*' activity from the portal. Click on the '*GUIDE 2.0*' tab after logging in – You'll find all of the '*Guide 1.0 Activities*' available for download under the tab of the same name. You'll also find additional materials for a number of Project WET Guide 2.0 activities, courtesy of Project WET Coordinators across the country! The Portal includes the Common Core Standard correlations for Guide 2.0 activities and we are in the process of updating our draft NGSS correlations.

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 to review the full Gazette and all linkages to websites in this edition and/or contact us for updates!