Winter/Spring
2013

Issue 13

WATERMARKS

The California Newsletter for Citizen Water Quality Monitoring

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E. Burres

Watermarks: The California Newsletter for Citizen Water Quality Monitoring

Issue No. 13|Winter/Spring 2013

A product of the State Water Resources Control Board's Clean Water Team

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Cover photo:
Collage of images submitted by various citizen monitoring groups

Back cover:
Mayfly dun - E. Burres

Contents

World Water Monitoring Challenge!

World Water Monitoring Challenge™ (WWMC) is an international education and outreach program that builds public awareness and involvement in protecting water resources around the world by engaging citizens in the monitoring of their local waterbodies.

WWMC grew out of the World Water Monitoring Day program in 2012. While an official "day" continues to be observed each year on September 18, the broader "challenge" encourages people everywhere to test the quality of their waterways, share their findings, and protect our most precious resource. The program runs annually from March 22 (the United Nations' World Water Day) until December 31. The primary goal of the World Water Monitoring Challenge is to educate and engage citizens in the protection of the world's water resources. Many people are unaware of the impact their behaviors have on water quality. Conducting simple monitoring tests teaches participants about some of the most common indicators of water health and encourages further participation in more formal citizen monitoring efforts.

Last year Californians made an impressive showing nationally (6th highest in the nation for Number of Sites and for Participant Visits California was 5th highest.) despite reporting less sites and fewer participant visits than in 2011 (139 sites & 2,422 participant visits).

The Clean Water Team encourages everyone (families, schools, NGO's, agencies, Tribes….) to participate in the Challenge and monitor the beach, lake, pond, stream or river closet to them.

STATE	SITES	PARTICIPANT VISITS	DISSOLVED OXYGEN*	pH*	TEMPERATURE* (°C)	TURBIDITY* (JTU)
CA	105	1,459	4.93	7.85	16.09	24.83

* Statewide average

www.monitorwater.org/uploadedFiles/Content/About/Year_in_Review_Reports/2012/YIR2012_StandardRes.pdf

You Can Make a Difference- Get Involved!

Under the federal Clean Water Act (CWA) and the state's pioneering Porter-Cologne Water Quality Control Act, the State and Regional Water Boards have regulatory responsibility for protecting the water quality of nearly 1.6 million acres of lakes, 1.3 million acres of bays and estuaries, 211,000 miles of rivers and streams, and about 1,100 miles of exquisite California coastline.

The Guide provides an overview of the Water Boards and the many opportunities that all Californians have to participate with the Water Boards in decisions and activities that affect the state's water resources. While some of the public participation opportunities are formal, e.g., at a Water Board hearing, others are less formal, but just as important, e.g., a stakeholder process implemented by a Regional Board. Although the Guide doesn't contain information about specific water quality decisions that are before the Boards, it will direct you where you can find that information. We look forward to updating this Guide periodically to assure its continuing usefulness to you, the public.

Citizen's Guide to Working with the California Water Boards
www.waterboards.ca.gov/publications_forms/publications/general/docs/citizenguide2011.pdf

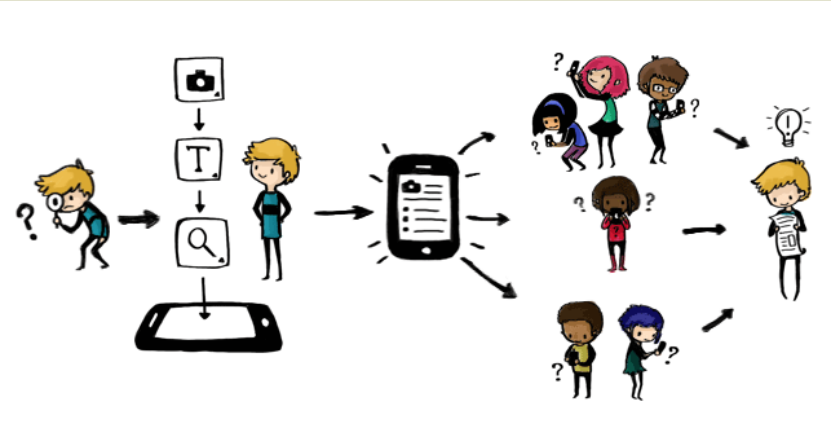
...get involved...

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

A Swarm of Apps

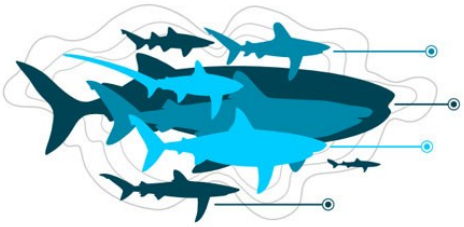
SENSR: An Easy Way To Harness The Power Of Citizen Science

The proliferation of mobile and computing devices in everyday life has enriched our surroundings in terms of sensing and sharing, providing diverse channels to scientists for data collection, and creating tremendous opportunities for everyday people to engage in scientific projects. However, the difficulty of creating an appropriate application for mobile devices often hinders grassroots efforts. **SENSR** allows people without programming skills to easily build a mobile data collection tool and manage data among users. The process is as follow:

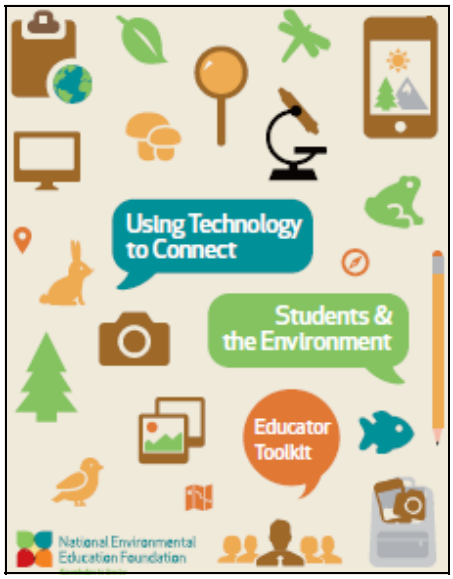


1. On this website, you can create and maintain a project which will run on a mobile phone!
2. Create a project that requires contributions from citizen scientists
3. The project you created is deployed in the mobile SENSR application as well as in this website
4. Citizen scientists can now subscribe and contribute data to your project remotely though the SENSR mobile application.

The Shark Observation Network provides a means for divers, marine biologists and naturalists around the world to enter data about shark sightings, including date, time, location, water temperature and other environmental variables. Membership is free and all of the data is permanently accessible to all users. The app, called **Shark Spotter**, is free of charge and will soon be available on Google Play. (It is available now from App Geyser here). www.geerg.ca/sharksonline/autres/index.php



Shark Observation **Network**®



Using Technology to Connect Students & the Environment

The National Environmental Education Foundation, with generous support from Toshiba America Information Systems, Inc., and in partnership with Project Noah, presents *Using Technology to Connect Students & the Environment*, a video on how technology can further STEM learning through the environment, both in nature and in the classroom. Video www.youtube.com/watch?v=p-QjpMhm9rY

The Educator Toolkit for *Using Technology to Connect Students & the Environment* is a companion to the video, and includes activities and resources at all grade levels for implementing a project similar to the one featured in the video. Toolkit www.eeweek.org/pdf/Video_Toolkit.pdf

The Swim Guide is an app for iPhone®, iPad®, iPod touch® and Android that makes it easy to explore and enjoy the best beaches in many areas – including California Find your closest beach using list, map, or search tools

- Discover a wide variety of beaches, ranging from city parks to remote lakes ideal for camping
- Identify at a glance which beaches are clean for swimming (Green) and which have water quality problems (Red) in real-time
- Get walking, driving, or transit directions to the beach of your choice
- Bookmark beaches for easy access
- Invite your friends to join you at the beach using Facebook, Twitter, email and SMS text messaging
- Report pollution or environmental concerns

The Swim Guide gives you original descriptions with photographs of over 1,500 different beaches so you can learn a bit of history and geography as you explore! www.theswimguide.org/

GET WATER QUALITY GRADES ON THE GO

Beachgoers can now check the latest water quality grades at 650+ West Coast beaches via Heal the Bay's Beach Report Card mobile app for the iPhone or Android, at www.beachreportcard.org.

Two Universities in the Great Lakes Region Are Using Creekwatch in a Challenge Called Waterpressures.

Northwestern and the University of Wisconsin – Milwaukee are asking science professors to pair their students with municipal officials to work on a water issue. Creekwatch is one tool students will use to monitor the waterway they work on.

www.waterpressures.org/

Secchi App is the mobile interface to Plymouth University's Secchi Disk project enabling any seafarer to take part in a global study of the phytoplankton in our oceans. The phytoplankton in the sea, although they are invisible to the naked eye, are the ocean's most important inhabitants since they begin the plankton food web that underpins the marine food chain.We need to know much more about these changes and you can help by using a simple piece of scientific equipment called a Secchi Disk, measuring tape and using the Secchi App.

https://play.google.com/store/apps/details?id=uk.ac.plymouth.matmutt.secchi&hl=en

Much to do about DATA

Extending the Utilization of Citizen Monitoring Data

By Ray Hiemstra

So you have gone to all the work of collecting a good set of data; you have a QAPP, trained your monitors, collected your data and have it in a database or report. The next step for most organizations is to use the data internally to achieve the goal of the project, and often that is the end of the road. But with a little extra effort there is far more you can do with your data. Sharing your data maximizes the benefits of your data collection effort and has the added bonus of making your organization look good. Data sharing is a priority for the state and they may not be the only ones looking for the type of information you have.

The primary way to share your data is with the California Environmental Quality Data Network (CEDEN). This is a statewide database that is widely used by researchers and government agencies. You can submit your data through one of four regional CEDEN "hubs". Get started by visiting the CEDEN website at http://www.ceden.org/ceden_submitdata.shtml.

After you have utilized both these options don't forget that one of the best ways to get your data used is to promote it! If you know of an organization or agency that you think may be able to use your data, tell them about it. When you are at meetings where waters that you monitor are discussed be sure to talk about your data. If you repeat yourself enough, your local agencies/researchers will know your date is out there

Another use of your data is submitting it to the state for consideration in their review of the impaired waterbody (303d) list. Every three years the state puts out a call for water quality data so that they can evaluate our waters to insure they are swimmable, fishable and drinkable, and they need your data. While quality controlled data is the most likely to be used, any data can be submitted. 2012 was the last revision so keep an eye out for the call for data for the 2015 review. Your data may help to de-list or list a waterbody.

Through these fairly simple methods my organizations, the Orange County Coastkeeper and the Citizen Water Monitors of Orange County, saw their data used repeatedly for 303d listings, TMDL development, and the development of both statewide and regional water quality standards and permits. You can too! You have gone to a lot of work to collect your data, now it is time to put it to work.

Ray Hiemstra is the Associate Director or Orange County Coaastkeeper and has run citizen monitoring projects documenting water and sediment quality in the Santa Ana River Watershed for thirteen years. Ray participates as a Board Member of the Port of Los Angeles Harbor Safety Commission. He has also been the Project Manager for several projects contracted by the Regional Water Quality Control Board.

ON THE ROCKS

The American Songbird of the Stream

Photo Credit: USFWS

Find a fall or cascade, or rushing rapid, anywhere upon a clear stream, and there you will surely find its complementary ouzel, flitting about in the spring, dining in the foaming eddies, whirling like a leaf among the foam-bells; ever vigorous and enthusiastic, yet self-contained, and neither seeking nor shunning your company…He is the mountain stream's own darling, the hummingbird of blooming waters, loving rocky ripple slopes and sheets of foam as a bee loves flowers, and a lark loves sunshine and meadows.
-John Muir, The Mountains of California 1894

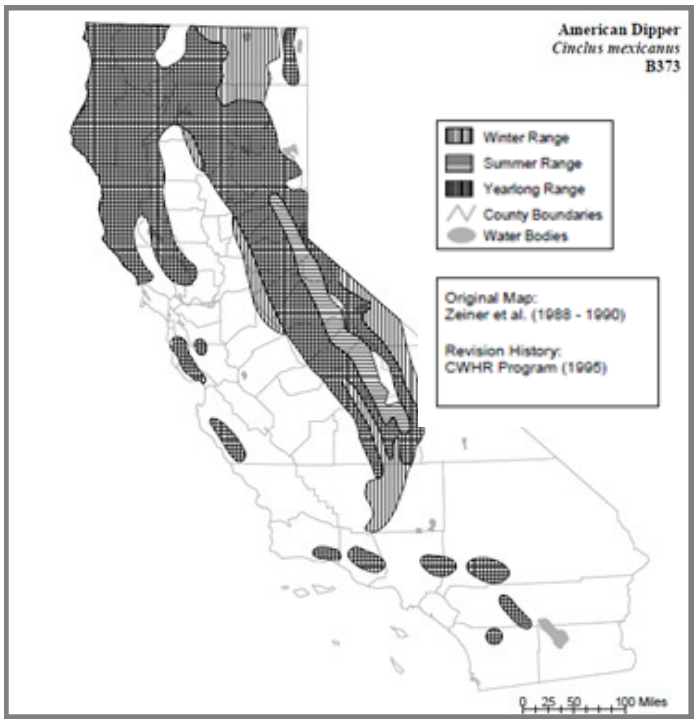
The American Dipper (*Cinclus mexicanus*) is a widely distributed bird species inhabiting mountain streams of the western North America region. The dipper has been known to be the only aquatic songbird. It is often seen disappearing into the foam of whitewater in order to forage for food, and known to dive up to twenty feet under water. They are able to remain underwater for more than twenty-five seconds.

Dippers tend to feed on aquatic insects, like mayflies and caddisflies, larvae and occasionally small fish. Even though they are always "dipping" in the water, the American Dipper gets its name from odd behavior of bobbing up and down with their whole body. The purpose of this bobbing is unknown, although there has been speculation that it acts as a threat to predators.

The Dipper is a small member of the order *Passeriforme* and the family *Cinclidae* and is the only aquatic passerine in America. Also known as the water ouzel, the dipper is a slate-gray, dark-billed bird with short powerful wings and a stubby tail. The male and female resemble each other, but the young are lighter gray and have a paler bill. There are five total species of dippers in the world. They are closely related to thrushes, but not to wrens as is apparent in most taxonomical field guides. They can commonly be found in Montana; however, they can also be found year-round where weather permits.

Photo Credit: commons.wikimedia.org/wiki/File:American_Dipper.jpg

Several locations of the American Dipper population in California is shown below:



Being a part of the order *Passeriforme*, the Dipper has wings that are short and powerful. They use this power from their stout wings underwater to stabilize and propel themselves through turbulent water. Their feet have strong toes, which allow them to walk along a swift streambed and not be carried away by the current. Scale-like closures cover their nostrils as they enter the water. They are able to see underwater because of a thin membrane that covers their eyes. This unique bird has larger oil glands than other songbirds, which creates an insulating down coat for the cold water and weather. Because this songbird has become so adapted to its surroundings, it can be considered great competition for other animals.

The aquatic songbird is extremely sensitive to its surroundings; the presence or absence of the Dipper can depict the health of the stream. Because the Dipper responds to stream degradation and pollution so readily, stream ecologists can use them as a tool to assess stream health. Because of their feeding habits, they respond to decreased water quality in clear streams. The reduction of food organisms like macroinvertebrates and fish may reduce the Dipper population at degraded sites. Having a declining Dipper population can signal impending environmental problems.

Habitat quality can also lower the Dipper's reproductive success. Because they don't like to venture too far off from the stream, they situate their nest on a cliff near the water. When the stream becomes degraded, a smaller number of eggs can be reproduced. This could be due to the female dippers finding insufficient food to aid in breeding. Since the Dipper is extremely sensitive to its surroundings, they can be used to assess water heal and help identify streams at risk.

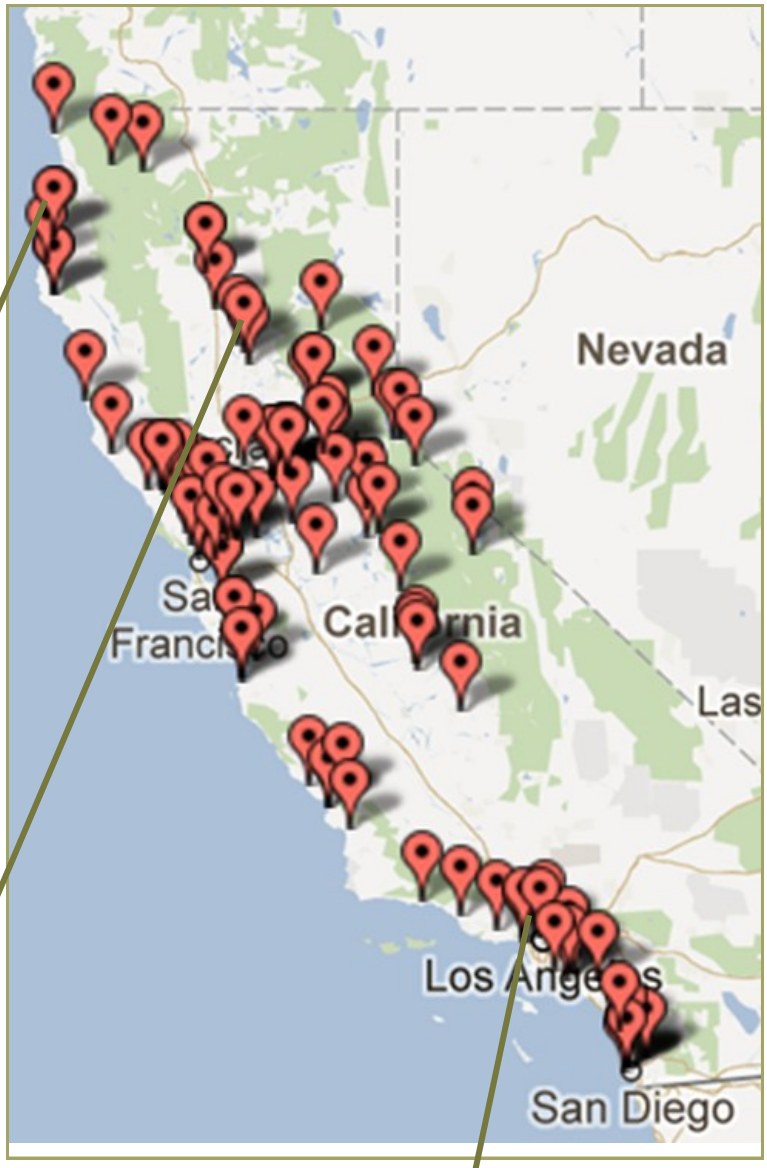
The American Dipper has some key threats that can lead to population decline such sediment and heavy pollution, acid mine drainage, runoff and sewer system pollution. Many streams suffer and will continue to suffer from these various problems, which will threaten the dipper and its food source. Research has also found a lower dipper population near lands that have been grazed by livestock. Also, snakes and other small mammals prey on eggs and young. Everyday recreational activities and development can harm the dipper if not properly managed. By helping to protect the water quality and health of streams, the health and population of the dipper can increase.

For more information about the American Dipper visit:

www.dfg.ca.gov
www.allaboutbirds.org/guide/American_Dipper/id
www.nwf.org/Wildlife/Wildlife-Library/Birds/American-Dipper.aspx

Learn About Your Watershed!

Since 2005, Humboldt Baykeeper's citizen monitors have been sampling over 30 sites ranging from streams to runoff channels, all flowing into Humboldt Bay. They have been compiling a water quality data bank, recording the prevalence of several different pollutants as well as collecting ambient streams conditions at least three times a year. They are currently focusing on their most threatening pollutant: bacterial fecal coliform and are undergoing DNA sequencing to find the source animal, and using GIS tools to record and analyze topography and land uses. Their goal is to find and reduce the source of fecal coliform and to improve water quality conditions in the tributaries and in Humboldt Bay.



Sierra Streams Institute promotes community stewardship and advances scientific knowledge of watersheds through monitoring, research, restoration and education, for the benefit of the entire Sierra Nevada region and beyond. Although SSI's geographic scope encompasses the entire Sierra Nevada region, their work is grounded—both historically and practically—in their home watershed of Deer Creek. They continue to monitor the creek's water quality and ecological condition, restore the creek and its adjacent habitats, and work with landowners, developers, and government agencies to protect and advocate for the creek.

Heal the Bay

Heal the Bay's Stream Team has been training volunteers since 1998. Up until now, they have been able to teach over 6,000 volunteers how to collect environmental data from the Malibu Creek Watershed, which is the last natural watershed in Los Angeles. Volunteers visit about 20 sites and conduct monthly water chemistry testing.

The Value of an Hour

In 2011 Californians donated 977.9 million hours of service which provided $21.3 billion of service. During that same year the Clean Water Team conducted a survey of Citizen Monitoring Programs and learned that your programs collectively contribute over 111,000 volunteer hours, worth over $2,688,000.00 of service annually (dollar value-California 2010 $24.18). Combined with operational expenses and the program value contributed by citizen monitoring towards monitoring California's watersheds the valuation exceeds $4.5m. Unfortunately we also learned that many programs did not know the total number of hours their volunteers donated nor their operational budgets

Yes, volunteering is not about money and for many hanging a financial label on it seems inappropriate and distasteful. We do have the ability to share how many monitoring sites and manned by citizen monitors and how many stream miles are assessed by volunteers. But valuation of volunteer hours and nonprofit programs are important measures that community leaders, board members, funders and donors want to know. It speaks to an organization's support and its resources to fulfill its mission. Without this information an organization cannot fully document its impact and services to its community and watershed (s) of interest.

Volunteers help your organization fulfill its mission. Tracking volunteer hours allows you to demonstrate the level of support you receive from the community. Tracking volunteer time can help you meet a grant's match requirements, improve your financial statement presentations, reduce liability, assist in maintaining an organizations federal tax exemption status, and this information can also be used for advocacy and program planning purposes.

For example, let's say a small nonprofit runs a watershed education program that is manned entirely by volunteers. Its expenses are limited to a small operating budget, but it is struggling to raise money, since funders and donors prefer to support programs. Tracking volunteer hours, however, can change the picture. The nonprofit can use the total — and the corresponding dollar value — to put its operating budget in perspective, which can help attract funding. The full dollar amount demonstrates the operational value of your program. Think of it in terms of "replacement value for insurance purposes" or what it would cost to offer a nonprofit's services via a for profit business. Without this information you would only be giving a false sense of the true cost of your program's services.

Volunteering and Civic Engagement In California

Trends and Highlights Overview in 2011

- ◊ 25.7% of residents volunteer, ranking them 37th among the 50 states and Washington, DC.
- ◊ 34.1 volunteer hours per resident.
- ◊ 58.7% do favors for their neighbors.
- ◊ 89.1% eat dinner with their family a few times a week or more.
- ◊ 46.4% discuss politics a few times a month or more.
- ◊ 7.37 million volunteers.
- ◊ 977.9 million hours of service.
- ◊ $21.3 billion of service contributed.

www.volunteeringinamerica.gov/CA

Calculating Volunteer Time Values

The estimated value of volunteer time in California for 2011 is $24.18 per hour. www.independentsector.org/volunteer_time

The Bureau of Labor Statistics for hourly wages by occupation that can be used to determine the value of a specialized skill. This is where the paid and unpaid (volunteer) job descriptions and tracking hours by volunteers and what that volunteer does comes in handy.

◊ **May 2011 State Occupational Employment and Wage Estimates California** www.bls.gov/oes/current/

Volunteer service should be included in most not-for-profit financial reports and added as notes to internal statements. Hours devoted to program activities, office jobs, and special events may be valued at an estimated composite rate of $21.36 (in 2010), regardless of whom performs the work. When an accountant, lawyer, or other professional with special skills donates pro bono services, however, the time is generally valued at that professional's customary rate. If a doctor is calibrating dissolved oxygen meters or a lawyer entering data, he or she is not performing his or her specialized skill for the nonprofit, and their volunteer hour value would not be higher. *See side bar "Calculating Volunteer Time Values"*

Volunteer time is often used by organizations to meet requirements for matching funds. Sometimes a grant will stipulate that the nonprofit must match a percentage of grant funds and that the value of volunteer time may qualify toward satisfaction of the match requirement. Some funders and donors also want to know what resources your nonprofit already receives and from whom. This may help them determine if your program has the people in place to get the job done well.

Documenting volunteer time can help protect volunteers and the nonprofit. Requiring volunteers to log activity creates a record that may become important evidence in defending the nonprofit or volunteers from allegations of misconduct. Blue Avocado contributor Pamela Davis of the Nonprofits' Insurance Alliance of California and ANI-RRG, the country's leading policyholder-controlled insurers of nonprofits, shared this real life example:

While enjoying hors d'oeuvres at a special event, a guest was injured from slipping on a piece of cheese. The nonprofit had a safety policy that required volunteers to scan for such dangers, record arrival and departure times and the times they did safety reviews. "From this it was easy to show that the nonprofit was not liable for failing to maintain a safe environment," Pamela said. "It had taken very appropriate steps and was completely absolved of liability."

We count what we value, so tracking is recognition that volunteer time is important. Recognition is a good investment; it pays off spectacularly. Tracking hours allows programs to celebrate a volunteer's milestones of time contributed (100, 250, 500, 1000 hours) and can serves as motivators for volunteers as they earn various awards such as certificates, pins, hats, shirts and jackets or other mementos recognizing their service. *See side bar "Tracking Tips"*

Tracking Tips

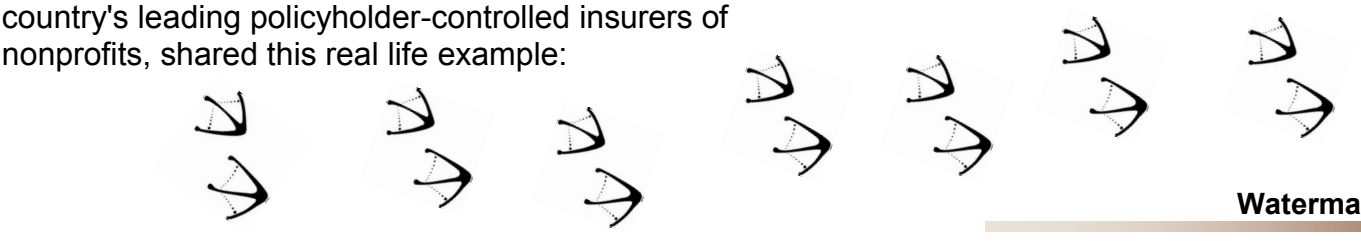
The best way to track volunteer service is to record the hours and related tasks as they are donated. Trying to account for service after the fact is difficult, and the results are often inaccurate. There are many different sample tracking forms on the Internet that can be customized to meet your organization's needs. Some resources are available for free, others on a fee basis.

Examples of Tracking Forms-

- www.blueavocado.org/sites/default/files/Vol%20tracking%20form%20blank.pdf
- Volunteer Time Log: www.blueavocado.org/sites/default/files/Volunteer%20Time%20Log.pdf

Every minute counts, so track and recognize the hours of work your volunteers contribute and share the impact and value of your watershed stewardship program with your community.

- http://acwi.gov/monitoring/conference/2012/K1/K1Burres1.pdf
- www.blueavocado.org/content/tracking-volunteer-time-boost-your-bottom-line-complete-accounting-
- www.independentsector.org/volunteer_time



Volunteer Job Description Template

POSITION TITLE

This will be the volunteer's identification. Give this as much prestige as possible, such as Field Technician instead of Volunteer Sampler.

MAJOR OBJECTIVE

Create a short concise statement reflecting the ultimate goals of the service to be performed. In short, state what the purpose of the position is and how will the volunteer's work affect the project's outcome? It is important to identify the expected impact for both direct service and administrative assignments so that volunteers will understand how important their work is.

RESPONSIBILITIES & DUTIES

List each duty and responsibility of the job and define what is expected from the volunteer, be as specific as possible.

COMMITMENT

What do you expect of the volunteer? Include Length of service, hours per week, hours per day. Include any special requirements such as weekend work. The minimum number of months you need from the volunteer based on your investment in training and supervision becomes the minimum length of commitment for the volunteer. A maximum time commitment should also be specified for the volunteer (number of hours per week, month, etc.).

WORK LOCATION

This is where you mention where the individual be working. Will the volunteer be working in multiple locations, are the work locations remote field sites, can the work be done at home…? Is the sponsoring organizations paying transportation costs? You may want to state if public transportation is near your work site/s so you can recruit people who might not have their own transportation.

TIME

This should include the exact duty hours and which days of the week the volunteer is to perform the services.

ORIENTATION/TRAINING

This includes the nature, specific content, and the approximate hours for orientation and training. Identify and contact information of the individuals who will conduct the training.

ON-THE-JOB SUPERVISION

Name of the supervisor or the position of the supervisor. In most cases this will be the person with direct responsibility for the service.

SAFETY – HAZARD COMMUNICATION

Will the volunteer be working in the "wild" (poison oak, mosquitos, in a stream…) a laboratory (chemicals…) or another type of location with possible hazards? What personal protective equipment (PPE) will be provided for the volunteer?

BENEFITS

List any available benefits to the volunteer such as free parking, coffee, mileage reimbursement, training, materials usage, letter of recommendation, service hours credit, recogniton…

QUALIFICATIONS

Include all things necessary for the effective performance of duties, listing requirements from physical to experiential qualities desired. Be careful not to over qualify the position – you could lose some excellent volunteers due to stringent educational requirements. Specifics such as a car, insurance needed, etc., should be noted.

OTHER

Include the date the description was written or the date that it was updated. Include information about how to get more information and who to call if interested. You might want to include signature lines for the volunteer manager and the site supervisor.

www.worldvolunteerweb.org/resources/how-to-guides/manage-volunteers/doc/developing-volunteer-job-descriptions.html
http://nonprofit.about.com/od/volunteers/ht/voldespos.htm

Interview with a WATER WARRIOR

Joanne McFarlin

Joanne McFarlin was always a community volunteer and growing up around creeks; she always had a love for water. As a Senior Ecologist at Acterra, she is able to fulfill her passion by providing volunteers with knowledge on the importance of the protection and restoration of local habitats. McFarlin earned her B.S. degree in Biology from the University of California at Davis and her A.A. degree in Environmental Stewardship from De Anza College.

McFarlin's work at Acterra began in 2012. Prior to that, she worked as a Programs Director for the Stevens and Permanente Creeks Watershed Council (SPCWC) where she was able to engage the community in stewardship of the watershed. This allowed volunteers to be involved in water quality monitoring, biological monitoring using benthic macroinvertebrates, and habitat restoration.

In February 2012, SPCWC merged with Acterra's Stewardship Program to allow for an expansion of stewardship programs through the area and to widen the promotion of environmental education. The accomplishments completed by SPCWC are now referred to as the Stevens and Permanente Creeks Watershed Project (SPCWP).

The SPCWP covers the area that includes the Stevens and Permanente Creeks watershed, which includes around 48 square miles. The creeks flow through the Santa Cruz Mountains, Cupertino, Mountain View, Los Altos, and Sunnyvale. Volunteers work together to learn about the neighborhood creek habitats and contribute to healthy watersheds.

McFarlin feels strongly about ensuring her volunteers are doing work they can feel good about. "Wherever they live, they live in somebody's watershed and what they do counts," McFarlin said. She emphasizes the role that volunteers provide to Acterra with over 2000 hours provided from dedicated volunteers last year alone.

"It is important to connect our volunteers emotionally to the creek"

Current ongoing projects of Acterra are water quality monitoring and testing for fecal indicator bacteria at the Stevens and Permanente Creeks. McFarlin stresses that a large goal she has is to "massage the data collected by volunteers into a database, so local agencies can access the data and make it part of their long term creek management plan."

Acterra teamed up with students to test Stevens Creek for fecal contamination. According to McFarlin, a high amount of indicator bacteria were present at different sites around the Creek. However, they were unable to provide remediation due to a lack of funding. McFarlin encourages interested parties to participate in local watershed monitoring because small-scale solutions can have a large-scale effect.

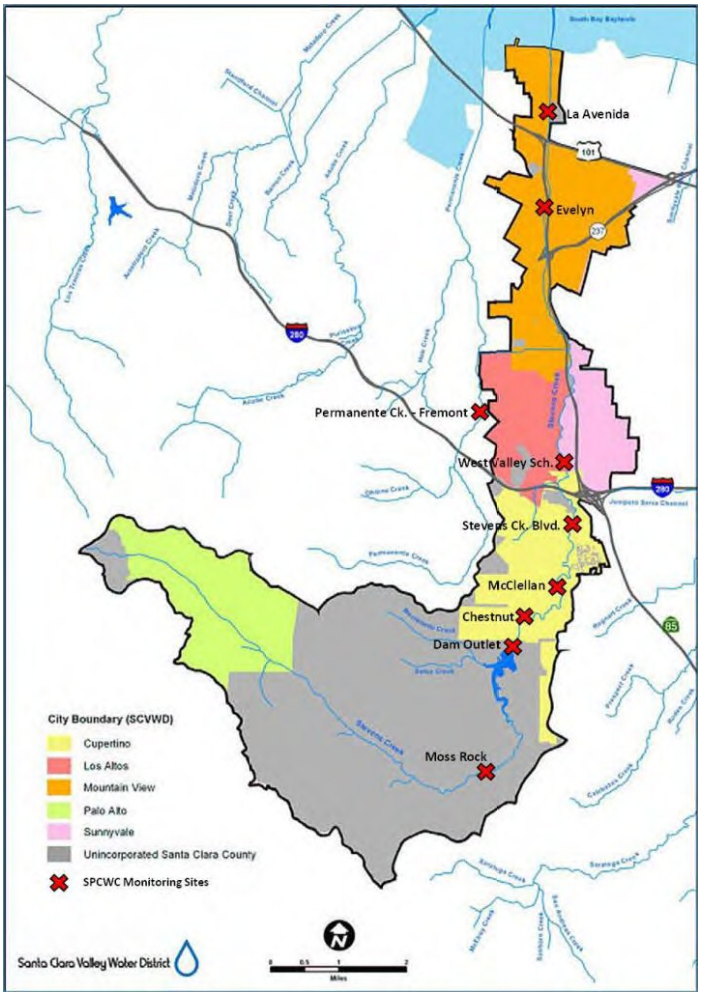
Volunteers are also trained to participate in the biomonitoring of organisms such as benthic macroinvertebrates. McFarlin has partnered with schools in her area to provide field trips for students. She also helped students expand their knowledge by learning from a stream ecologist and entomologist from the U.S. Geological Survey. These students contribute in the stream assessment of the Stevens and Permanente Creeks, and McFarlin helps to teach them about creek ecology around the creeks and within a laboratory setting. The collection of certain macroinvertebrates can play a big role in helping assess the aquatic habitat quality at that site.

The insect larvae, worms, and snails that volunteers collect from the bottom of the creeks are an important part of the aquatic ecosystem, and they also serve as an important indicator of creek health. Students also check for "bugs" that are known to be pollution tolerant along with others that are quite sensitive to degraded water quality. The bugs that these students find "…can tell us if we have a pollution problem," McFarlin says.

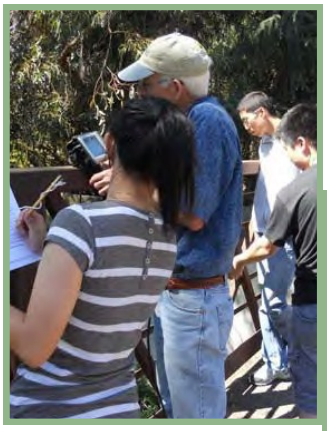
In 2006, Stevens and Permanente Creeks Watershed Council volunteers began studying benthic macroinvertebrates. These volunteers spend around four days in field using a targeted-riffle method to collect replicate samples from every site. They also aid in the collection of physical habitat data including wetted channel width, canopy cover, depth, flow rate, and major particle size as well as water chemistry. It is the hands-on programs such as this one that volunteers appreciate the most, according to McFarlin. "The volunteers enjoy doing work they can feel good about."

In order to expand stewardship projects, Acterra has collaborated with Google. "Students from Mountain View High School have joined a project with benthic macroinvertebrates to several creeks in our area," McFarlin said. "It is important to collect data that can be used by local agencies to manage our creeks."

McFarlin's advice for future monitoring organizations is simple, "establish a structured plan and protocols with other agencies, so they can make use of the data and you can feel good that the data is making a difference."



SPCWP Water Monitoring Sites on Stevens and Permanente Creeks



Photos courtesy of Stevens & Permanente Creeks Watershed Project
Click to visit the Acterra website

BioBlitz: Fast and Furious Biomonitoring

BioBlitz is an intense period of biological surveying in an attempt to record all the living species of plants, animals, microbes, fungi, and other organisms as possible within a designated area. Groups of scientists, naturalists and volunteers conduct an intensive field study over a short, usually 24 hour, time period. Getting the public interested in biodiversity is the primary goal of a BioBlitz. It is hoped that by participating in these fun and exciting hands-on field studies, people will learn about biodiversity and better understand how to protect it.

Photo Courtesy of Sabrina Drill & FoLAR

National Geographic is helping conduct a BioBlitz in a different national park each year during the decade leading up to the U.S. National Park Service Centennial in 2016. Their 2008 BioBlitz was held in the Santa Monica Mountains National Recreation Area. During its 24-hour species inventory, teams of scientists, naturalists, and volunteers combed more than 150,000 acres (60,700 hectares), observing and recording as many species as possible.

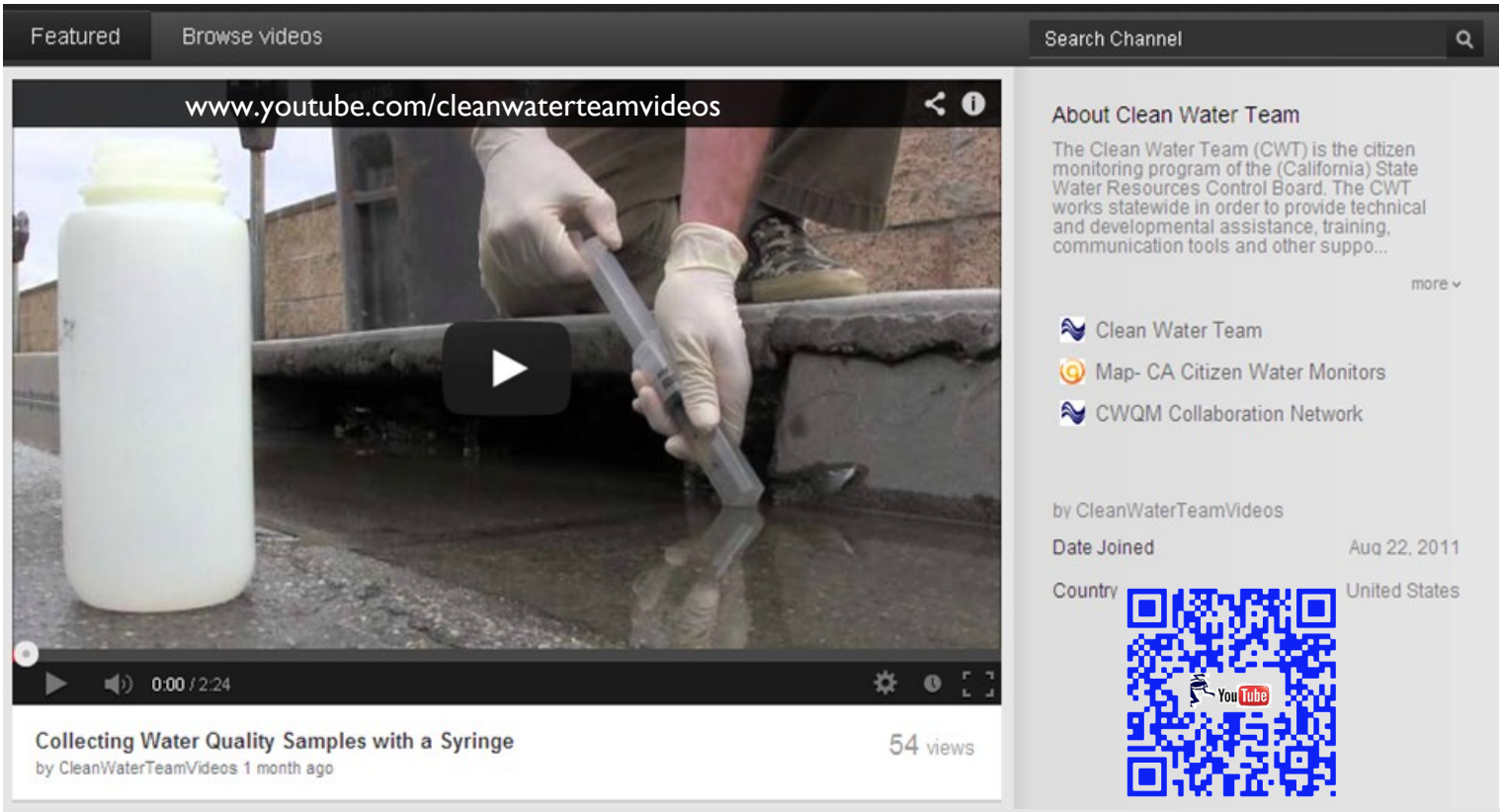
The Santa Barbara Natural History Museum's BioBlitz sent teams to the rich riparian corridor that surrounds Mission Creek. Not only did their study help paint a picture of what lives in the native landscape, but it will served as a helpful indicator of just how healthy downstream areas -i.e., more urban-may or may not be. It is the latter that has perhaps the most significance for the community at large as it provided a helpful context for the research already being done by the likes of the city's Creek Council and nonprofits such as Santa Barbara Channelkeeper and Heal the Ocean.

The Marin Municipal Water District in conjunction with the California Academy of Sciences has an ongoing BioBlits. With more than 18,000 acres of land and thousands of species in the Mt. Tamalpais Watershed, they cannot document everything at once, so they are taking a more targeted approach. Their BioBlitz surveys are performed over a period of months and include systematic specimen collection, including photos and GPS coordinates for each specimen. These collections and associated data will be added to the California Academy of Science's research collections and will serve as the beginnings of a new baseline of Mt. Tamalpais botanic diversity. In addition, the new findings will be compared to historic collections in order to document any shifts in ranges or distributions.
The multi-year effort has brought together botanical experts from around the Bay Area and more than 80 volunteer "citizen scientists." During the four bioblitz survey days held in 2012, participants recorded more than 700 observations comprising over 300 kinds of plants—close to 40 percent of the estimated.

Collaborative projects such as a BioBlitz are extremely advantageous. Not only is the data obtained valuable, the experiences allow groups to grow an active and engaged community for the benefit of these resources and create a pool of volunteer citizen scientists.

www.nationalgeographic.com/explorers/projects/bioblitz/
www.sdnhm.org/archive/research/readings/fn_0409.php
www.nationalgeographic.com/explorers/projects/bioblitz/bioblitz-ca-2008/
www.inaturalist.org/projects/biodiversity-survey-on-the-mt-tamalpais-watershed

Clean Water Team Videos



Visit the Clean Water Team's improved YouTube page featuring new videos:

-17 Point Spherical Convex Densiometer Modification
- Recognizing Basic Flow Habitats
- Collecting Water Samples with a Syringe
- San Diego Coastkeeper: Citizen Scientists Watching the Waters of America's Finest City

Clean Water Team Calendar 2013

The CWT calendar serves two purposes: it highlights the importance of California's surface waters, and celebrates the state's citizen monitors who volunteer to improve and protect water quality by using applied science to monitor the state's waters.

The calendar can be downloaded for free, either with or without the web link addresses being visible:

2013 California Citizen Monitoring Calendar
www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/volunteer/calendar2013.pdf

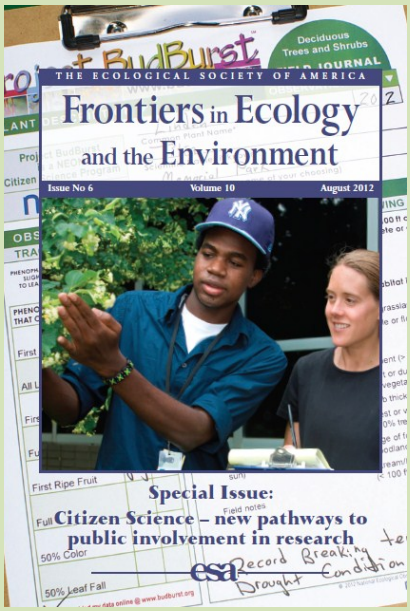
2013 California Citizen Monitoring Calendar (with viewable URLs)
www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/volunteer/calendar2013urls.pdf

Working Together for Clean Water

Ninth National Monitoring Conference
April 28th – May 2nd, 2014

Make plans now to join us for the Ninth National Monitoring Conference to be held April 28th – May 2nd, 2014. The conference, with around 1,000 attendees in 2010 and 2012, is an exciting opportunity for water practitioners from all backgrounds—including governmental and tribal organizations, academia, watershed and environmental groups, and the private sector—to exchange information, develop new skills, showcase new findings, and highlight recent innovations and cutting-edge tools in water-quality monitoring, assessment, and reporting. More information will be forthcoming later this Spring on the Council's website: acwi.gov/monitoring/

Frontiers in Ecology and the Environment

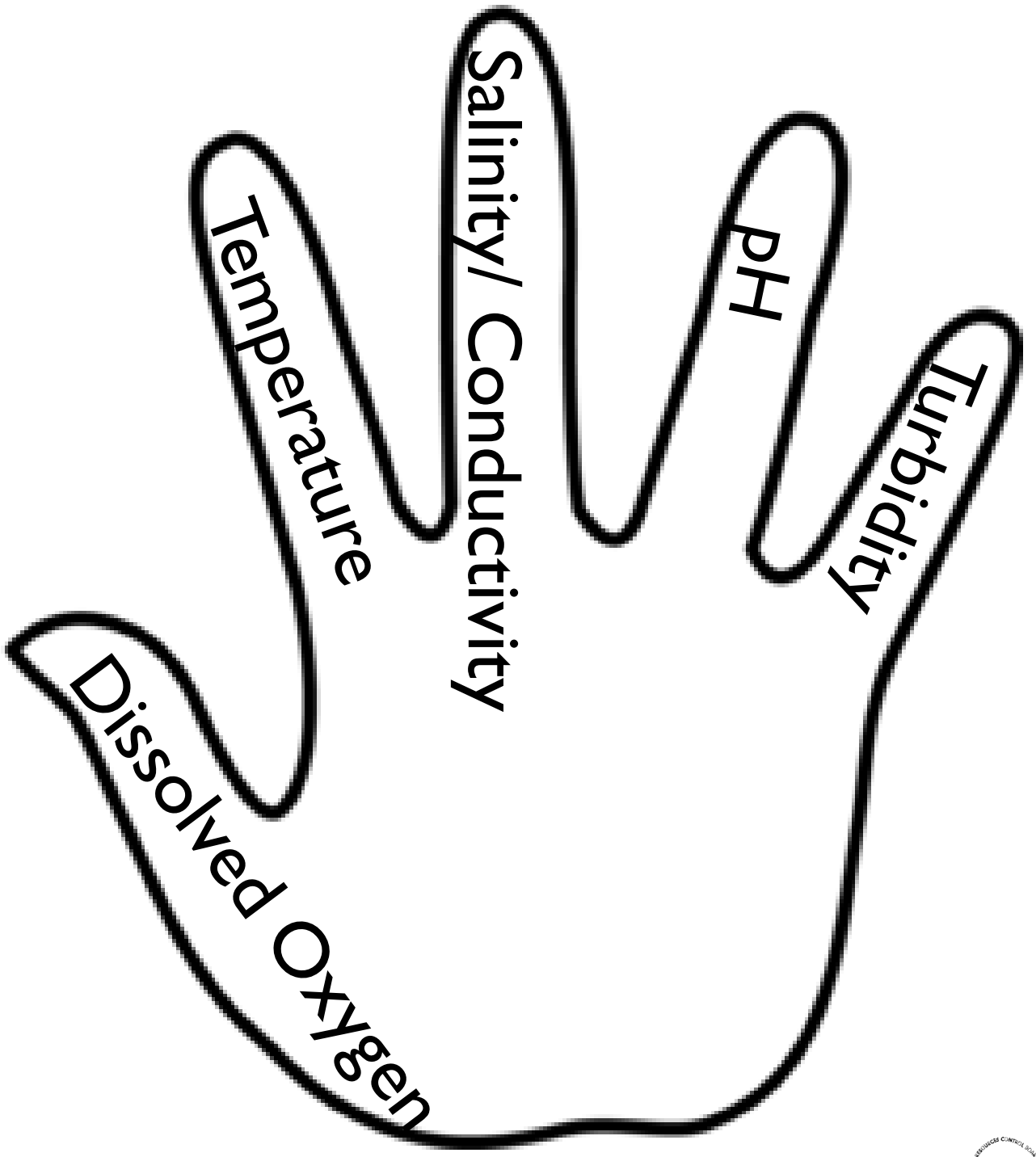


This special issue of Frontiers in Ecology and the Environment begins with three overview papers on Citizen Science (CS)– its past, present, and future. These papers set the stage for 10 shorter papers, highlighting different aspects of CS. The authors of these short papers were asked not to use this venue to simply promote their programs. They were invited to focus on a particular aspect of the program and activities as a basis for sharing the "lessons learned" that might be transferrable to other CS projects – perhaps even ones that readers of *Frontiers* might be inspired to launch after reading this issue. Here, you will find discussions about new tools in development, the need to increase diversity among participants, and approaches to data validation and program assessment, as well as how CS can enhance education in formal and informal settings, and how to engage recreationists in CS efforts.

Read More: www.esajournals.org/doi/full/10.1890/1540-9295-10.6.283

A Helping Hand

5 Fingers for 5 Vital Signs



www.waterboards.ca.gov/water_issues/programs/swamp/cwt_guidance.shtml#30

Clean Water Team

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www.swrcb.ca.gov/water_issues/programs/swamp/cwt_volunteer.shtml