

California's Surface Water Ambient Monitoring Program

An Introduction to Citizen Monitoring in California and The Clean Water Team

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Q: What is citizen science?

A: It is usually a scientific partnership between the public and professional scientists.

EXAMPLES:

Clearinghouse for ideas, news, and resources in support of citizen science-- partnerships between volunteers and scientists that answer real-world questions; and of course a few projects involving birds.

<http://www.birds.cornell.edu/citscitoolkit>

Astronomy

www.galaxyzoo.org

<http://faulkes-telescope.com>

Fish Tagging Studies

<http://fwie.fw.vt.edu/tagging/>

Ecosystem Inventories

<http://www.reefcheck.org/>

<http://www.restoretherockies.org/>

http://www.appalachianforest.org/cem_conf_pg.htm

<http://www.seattleaquarium.org/NetCommunity/Page.aspx?pid=268>

Meteorological and Climate Studies

<http://www.cocorahs.org/>

<http://www.naturewatch.ca/english/icewatch/>

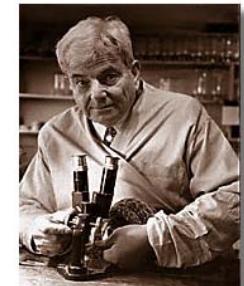
Epidemiological Uses

US Currency Tracking Project "Where's George"

<http://www.wheresgeorge.com/>



Some Famous Citizen Scientists:
Albert Einstein,
Benjamin Franklin &
Laurence Klauber.



What is Citizen Monitoring?



Citizen Monitoring is any monitoring activity of aquatic resources, aquatic habitat, and water quality that relies in whole or in part on participation by volunteers, students or non-paid staff.



Citizen Monitoring Origins In The U.S.:

The National Weather Service began recruiting volunteers in **1890**, to report daily measurements of rainfall and air temperature.



More than 11,000 volunteer weather stations now exist nationwide, and we have much knowledge of our nation's climate is based on that data.



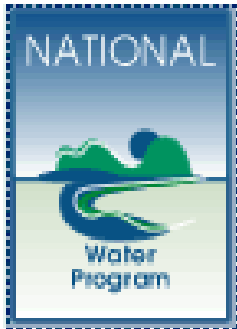
The Izaak Walton League of America kicked off volunteer water monitoring in **1920** when volunteers conducted the first national water survey for President Calvin Coolidge.



National and International Presence:



EPA- OWOW web page's latest directory of citizen monitoring shows that there are at least 520 organized groups in 32 states. (CREES 2006)



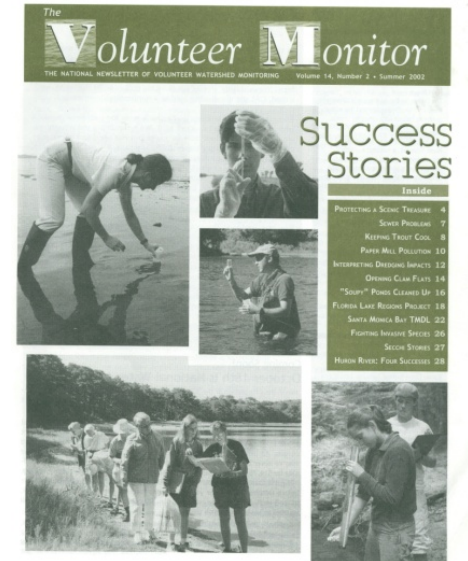
The Clean Water Team conducted an internet survey and discovered that citizen monitoring activities are found in **every state**. It was also learned that most states have some of formal citizen monitoring support.



Citizen monitoring activities are also found throughout the **world** and is not just a local or national movement.



World WATER MONITORING Day

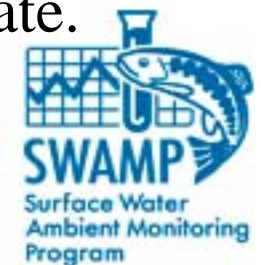


Summary of Citizen Monitors Statewide



Citizen Monitors are found throughout California and in 8 of 9 Water Resource Control Board Regions

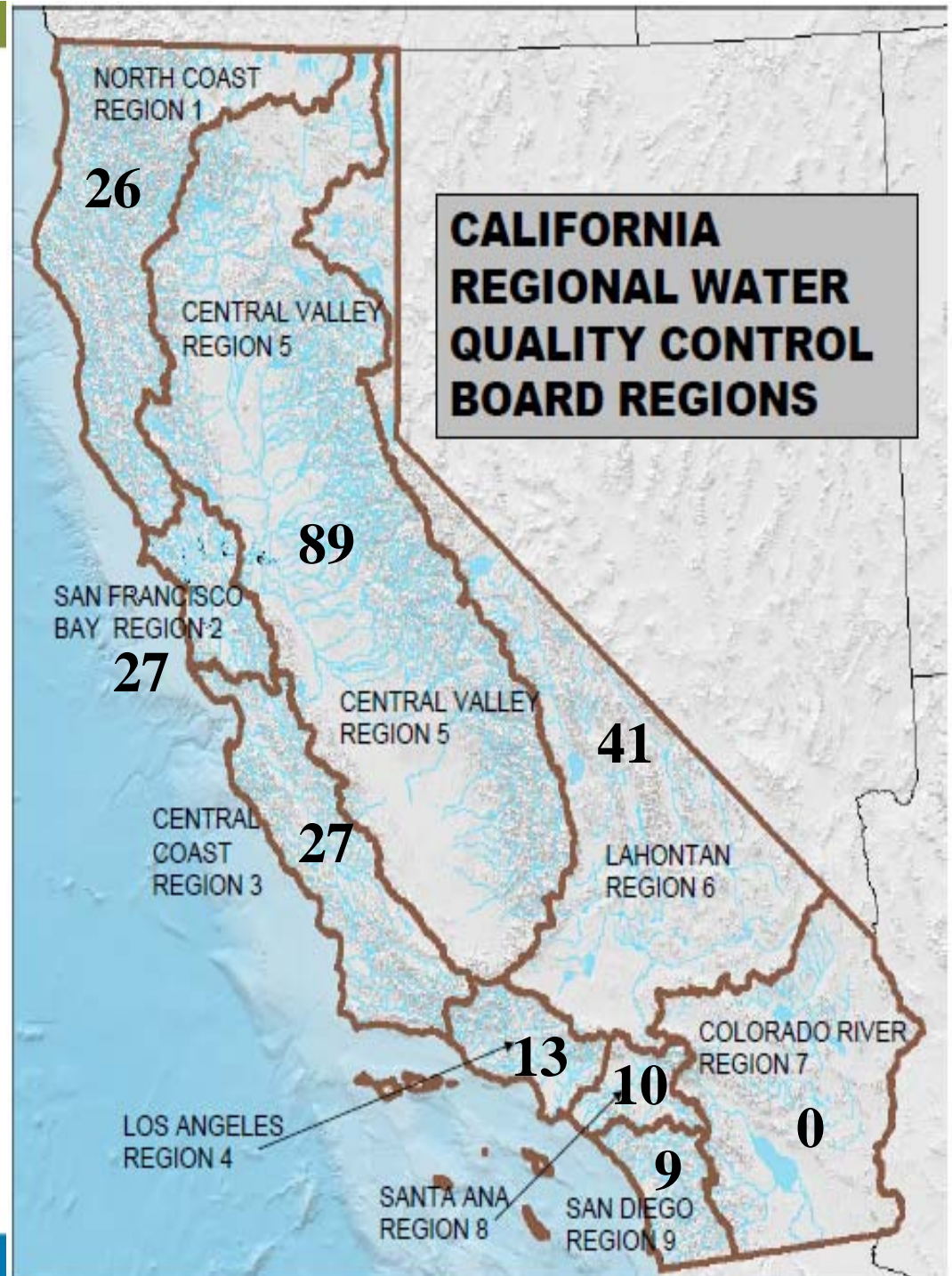
In 2008 over 200 citizen monitoring organizations were identified in the State.



Number of Citizen Monitoring Programs Per Region

Feb 2010

In a recent survey the CWT found over 250 programs. The numbers on this map represent programs located within a specific region but do not include multi-region programs.



Examples of Local Steering Teams and Consortiums



- **CITIZEN MONITORS OF ORANGE COUNTY** <http://www.cwmoc.org>
- **SAN DIEGO CITIZEN WATERSHED MONITORING CONSORTIUM**
<http://www.sdcwmc.org>
- **LOS ANGELES REGIONAL CITIZEN MONITORING STEERING TEAM**
<http://programs.scmi.us/citizenwaterquality.html> (This group no longer exists.)
- **COASTAL WATERSHED COUNCIL** <http://www.coastal-watershed.org/>
- **SIERRA NEVADA ALLIANCE** <http://www.sierranevadaalliance.org/>
- **FRIENDS OF DEER CREEK** <http://www.friendsofdeercreek.org/>
- **SANTA CLARA CREEKS COALITION** <http://www.sccreeks.org/>
- **SAN FRANCISCO ESTUARY INSTITUTE** <http://www.sfei.org/>



Citizen Monitoring - Who is involved?

A variety of organizations may be involved in citizen monitoring projects, including but not limited to non-profit groups, Resource Conservation Districts (RCDs), Coordinated Resource Management and Planning (CRMP) groups, local government agencies



- Non Profits & Advocacy groups
- Resource Conservation Districts
- Counties
- Cities
- Grass-roots volunteers
- Self-monitoring
- Universities and Community Colleges
- Land Owners
- Resource Conservation Districts
- Farm Bureaus
- Indian Reservations
- Local Agencies
- Non-Government Agencies
- Advocacy Groups
- Environmental Organizations
- Sportsmen Organizations
- And more.....



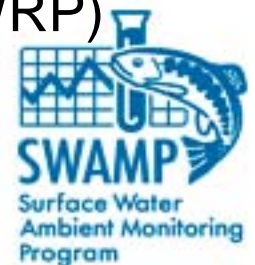
Levels of Citizen Monitoring

- Water Quality Condition Assessments
- Sampling and Analysis
- Sampling
- Bioassessments
- Snapshots
- Visual Assessments
- Participatory Sensing
- Education



Citizen Monitoring Project Diversity

- Baseline Data Acquisition
- Long Term Monitoring
- Bioassessments
- Stormwater
 - First Flush Monitoring
 - BMP Assessment
- Beneficial Use Attainment Studies & 303(d)
- Water Quality Criteria
- Anti-degradation Measures
 - TMDLs
 - NPS
 - BMPs
- Restoration Projects
- Special Studies
 - Toxicity
 - Brownfields
 - Fish Contamination
 - Recreational Water Contact Investigations
 - International Pellet Watch
 - National Monitoring Day
 - Secchi Dip-In
 - Bight Studies (SCCWRP)
 - Beach Trash
 - Microbiology



Myth Buster

Citizen monitoring data have been shown to be of acceptable quality. Concepts like *accuracy* and *precision* are applied.



- Quality Assurance Project Plans (QAPP) Based on EPA and SWAMP guidance are being implemented.
- Inter-calibration exercises are being held.



Myth Buster Studies- Related Research and Educational Efforts

- The *Volunteer Monitor* newsletter recently referenced our website as a location to find lists of volunteer monitoring-related studies.
 - Volunteer-Collected Data in Published Research Papers
 - Volunteer Monitoring Validation Studies Published in Science Journals
 - Additional Examples of Publications Referencing Volunteer Data
 - Additional research projects related to volunteer monitoring, can also be found and are sorted by topic area

<http://www.usawaterquality.org/volunteer/RelatedResearch/index.html>

- Shattering the Myths (Heal the Bay)
http://www.waterboards.ca.gov/water_issues/programs/nps/docs/shatteringthemyths.pdf



A Place For Citizen Monitors

Conservation:

At some point the will to conserve our natural resources has to rise up from the heart and soul of the people-citizens themselves taking conservation into their own hands, along with support of their government, making it happen.

Mollie H. Beattie

former USFWS Dir.

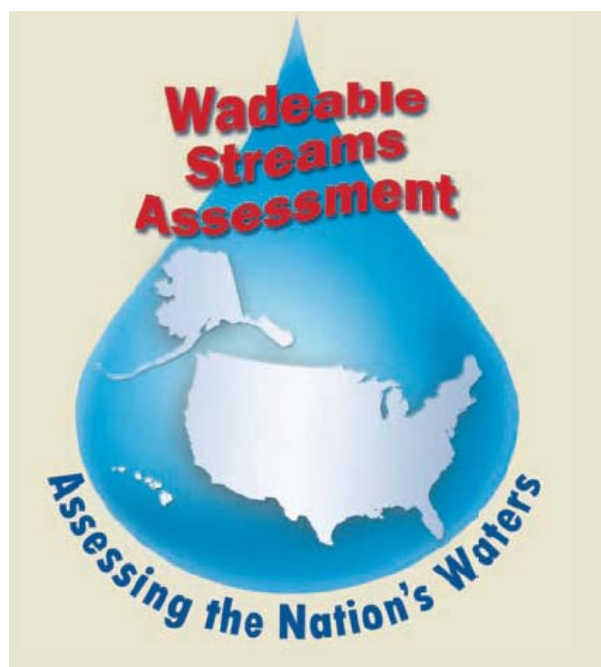
Partnerships:

Great discoveries and achievements invariably involve the cooperation of many minds.

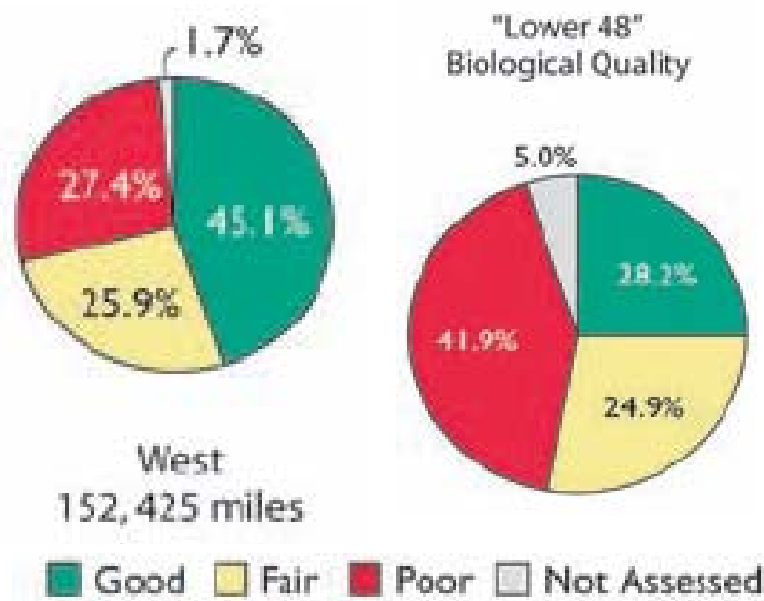
Alexander Graham Bell



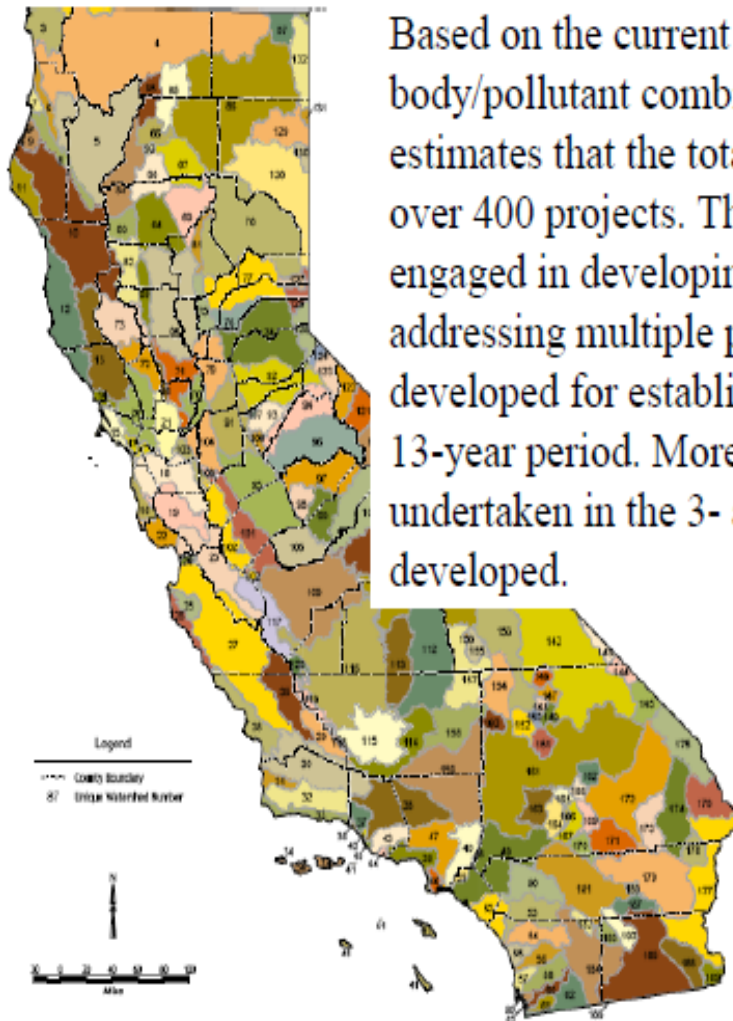
A Need for Citizen Monitors and Their Data



The WSA found that 28% of U.S. stream miles are in good condition compared to the best available reference sites in their regions, 25% are in fair condition, and 42% are in poor condition. **Another 5% were not assessed.**



NEED FOR DATA & ACTIVE CITIZEN WATERSHED STEWARDSHIP IN CALIFORNIA



Based on the current 303(d) list with over **1,883** water body/pollutant combinations, the State Board estimates that the total number of TMDLs needed is over 400 projects. The Regional Boards are currently engaged in developing over **120 TMDLs**, many addressing multiple pollutants. Schedules have been developed for establishing all required TMDLs over a 13-year period. More detailed schedules of work to be undertaken in the 3- and 5-year periods have also been developed.



Strategies for Improving Water Quality

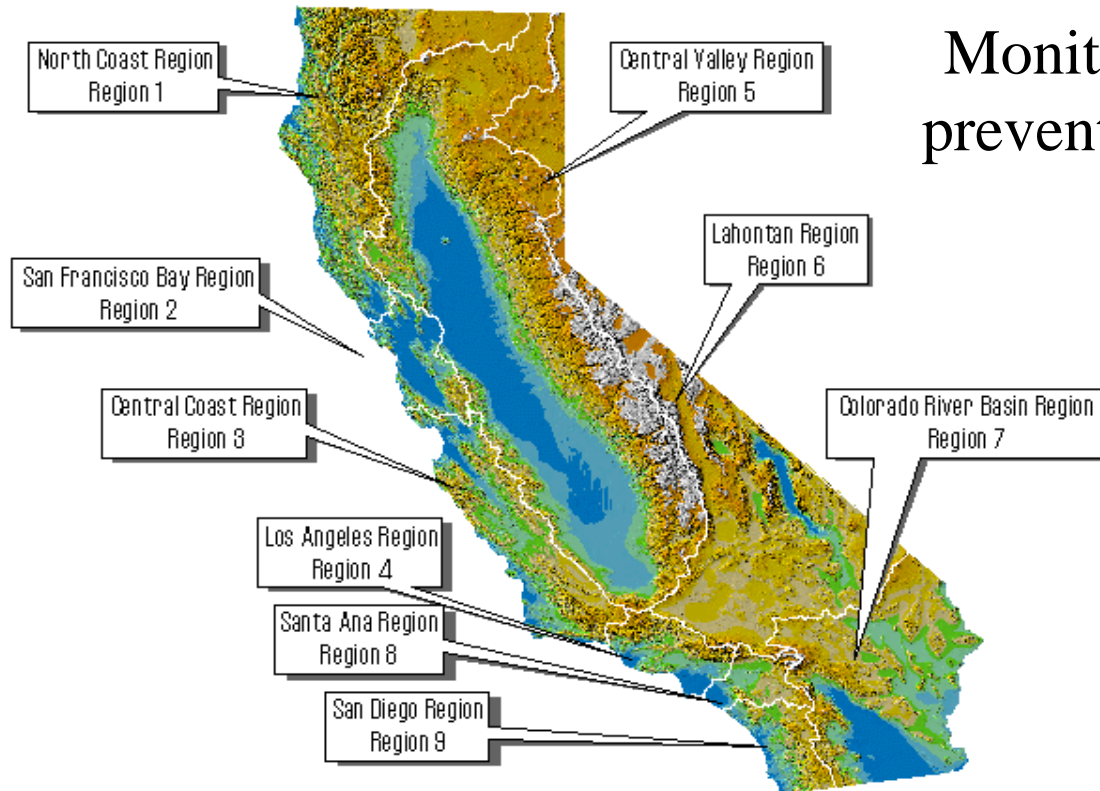
- Stakeholder Involvement
 - Watershed Management Initiative

- Science Based Stewardship
 - Production of actionable data
 - Implementation of Adaptive Management Plans

- Citizen Based Communications
 - Awareness
 - Education
 - Action



THE CLEAN WATER TEAM



The mission of the Clean Water Team is to build and support the State's Watersheds Stewardship through involvement by Citizen Monitoring in order to reduce and prevent water pollution and recover lost beneficial uses.

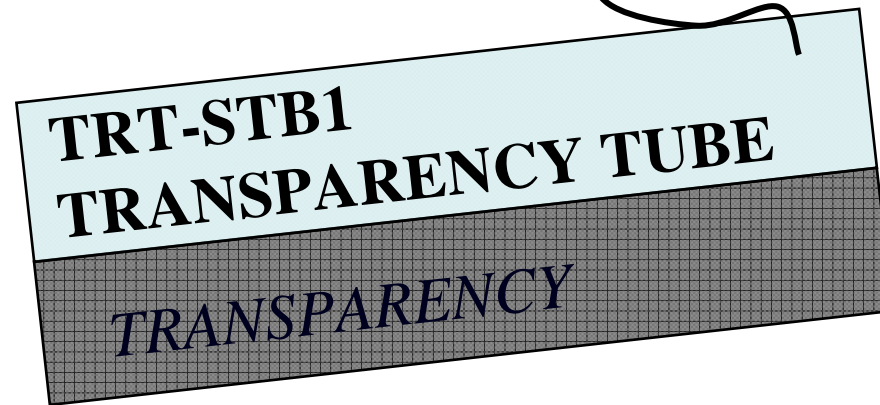
http://www.waterboards.ca.gov/water_issues/programs/swamp/cwt_volunteer.shtml

<http://www.waterboards.ca.gov/>

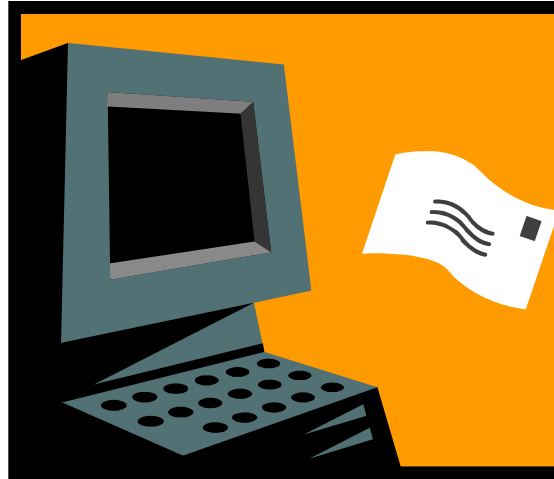


Clean Water Team Services

- Outreach and Communication
- Technical Assistance/Quality Assurance
- Training
- Loans of Equipment
- Event Support
- Information Management

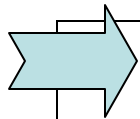


Clean Water Team Communication Tools

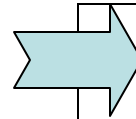


Self-Subscribe Email Listserve

http://www.waterboards.ca.gov/lyrisforms/swrcb_subscribe.html



Citizen
Monitoring/Clean
Water Team



Water Quality
Monitoring
Collaboration
Network Webinar
Series

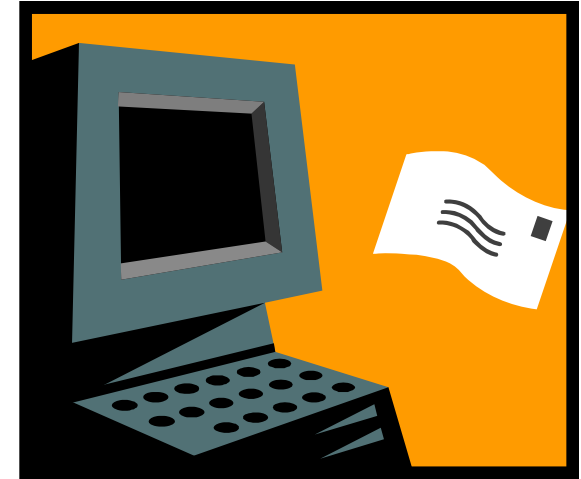


Non-Clean Water Team Communication Tools

The Volmonitor Listserver

connects volunteer water monitoring program coordinators nationwide by serving as an internet forum for questions, announcements, and discussion on topics of interest to the volunteer monitoring community.

<http://www.epa.gov/volunteer/listinstruct.html>



Citizen Clean Water Improvement Network

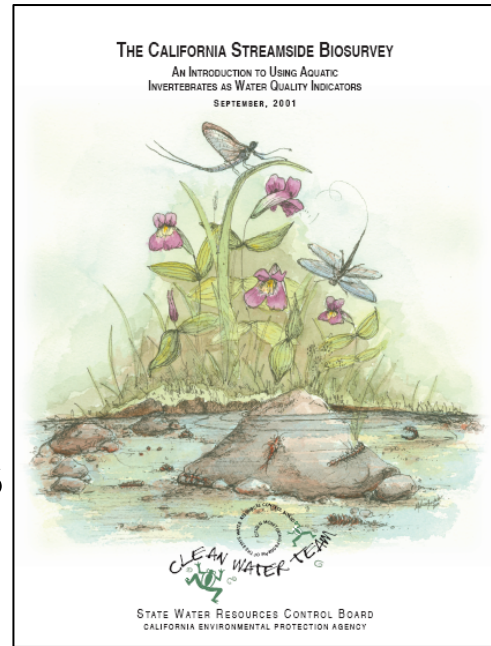
Many Citizens are Monitoring Water Quality. Our goal is to enable them to increase their capacity by sharing programs that work. Join us!

<http://ccwinet.ning.com/>



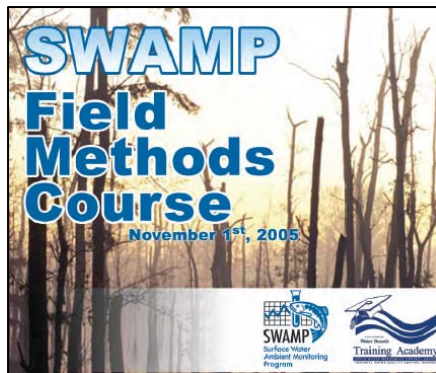
Technical Assistance

- Programmatic Planning & Sustainability
- Project Development
- Compendium for Watershed Monitors
- S.O.P.'s
- Safety
- Loans of Equipment



Training

- Training the Trainers
- Field Crew Training
- Measuring Water Quality
 - Field Measurements
 - Lab Measurement
- Rapid Bioassessment
- Data Management



Loans of Equipment

Short term loans of equipment can often be made if the items requested are within the inventory.



Quality Assurance

- SWAMP Field Techniques Distance Learning CD
http://water101.waterboards.ca.gov/swamp/qapp_advisor/FieldMethods/start.html
- CWT Compendium for Citizen Monitors
http://www.waterboards.ca.gov/water_issues/programs/swamp/cwt_guidance.shtml
- Citizen Monitoring Tool Box
http://www.waterboards.ca.gov/water_issues/programs/swamp/cwt_toolbox.shtml
- Technical Advisory Committees
- Quality Assurance Project Plans
- SWAMP QA Advisor
http://swamp.waterboards.ca.gov/swamp/qapp_advisor/
- Inter-Calibrations
- Field Reviews/Audits
- Q/A Projects
 - Benthic Macro-Invertebrate Taxonomy
 - Benthic Macro Invertebrate Family Guide
http://www.dfg.ca.gov/abl/Lab/california_referencecollection.asp
 - Q/A Officer and Technical Report Support



Information Management

Functions of a Data Management System

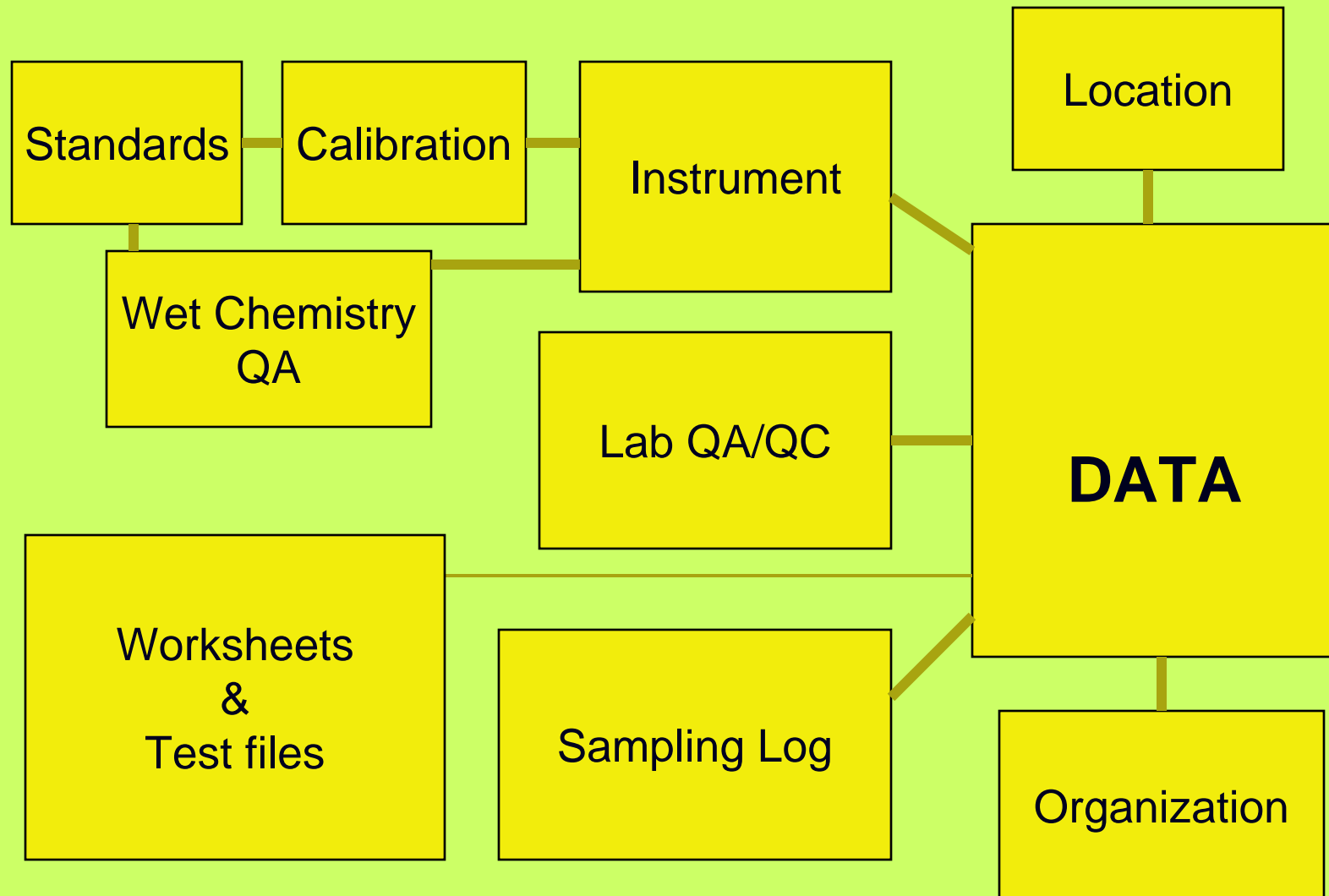
- Documentation and QA/QC
- Storage
- Retrieval
- Sharing and presentation

THE CLEAN WATER TEAM'S TOOL BOX FOR CITIZEN MONITORING PROGRAM

http://www.waterboards.ca.gov/water_issues/programs/swamp/cwt_toolbox.shtml

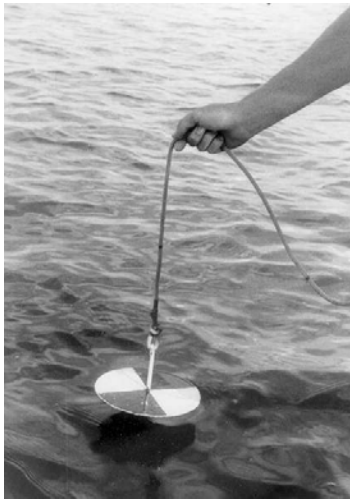
Creek/ Lake	Station name	Station ID	Date	Time	Depth (cm)	Sample ID	Parameter	Units	Detection Limit	Value	Qual	Comment/ Range	Instrument ID	Operator
San Leandro Creek	Chabot Park	SLC-WD	5/22/99	9:15	4	SLC-WD-e5	Conductivity	μS	10			dead battery	EC-SLC3	R. Kaufmann
San Leandro Creek	Chabot Park	SLC-WD	5/22/99	9:15	4	SLC-WD-e5	dissolved oxygen	mg/l (ppm)	0.2	8.2			DOW-SLC1	D. Elason
San Leandro Creek	Chabot Park	SLC-WD	5/22/99	9:15	4	SLC-WD-e5	H2O Temperature	°C	na	13.5			TR-SLC1	D. Elason
San Leandro Creek	Chabot Park	SLC-WD	5/22/99	9:15	4	SLC-WD-e5	pH	pH	na	7.6			PHSL-SLC3	R. Kaufmann
San Leandro Creek	Chabot Park	SLC-WD	5/22/99	9:15	4	SLC-WD-e5	pH	pH	4.5	7.3		7-7.5	PHST-SLC2	C. Ryan
San Leandro Creek	Chabot Park	SLC-WD	5/22/99	9:15	4	SLC-WD-e5	Turbidity	JTU	2		ND		TUJ-SLC1	C. Ryan
San Leandro Creek	Root Park	SLC-WC	5/22/99	10:00	3	SLC-WC-e5	Conductivity	μS	10	570			EC-SLC3	R. Kaufmann
San Leandro Creek	Root Park	SLC-WC	5/22/99	10:00	3	SLC-WC-e5	dissolved oxygen	mg/l (ppm)	0.2	7.6			DOW-SLC1	D. Elason
San Leandro Creek	Root Park	SLC-WC	5/22/99	10:00	3	SLC-WC-e5	H2O Temperature	°C	na	14.5			TR-SLC1	D. Elason
San Leandro Creek	Root Park	SLC-WC	5/22/99	10:00	3	SLC-WC-e5	pH	pH	na	7.8			PHSL-SLC3	R. Kaufmann
San Leandro Creek	Root Park	SLC-WC	5/22/99	10:00	3	SLC-WC-e5	pH	pH	4.5	8			PHST-SLC2	C. Ryan

Contents of the Project File



Event Support

- National Secchi Dip-In
- Inter-National Monitoring Day
- Snapshot Day(s)
- First Flush Monitoring



Secchi Dip-In



THANK YOU



“Our mission is to preserve and enhance the quality of California’s water resources and ensure their proper allocation and efficient use for present and future generations”

S W R C B

