California's Surface Water Ambient Monitoring Program

An Introduction to Citizen Monitoring and The Clean Water Team

July 22, 2009

Erick Burres

Citizen Monitoring Coordinator

SWRCB's Clean Water Team

eburres@waterboards.ca.gov

(213) 576-6768

Clean Water Team

Water Boards

SWAMP
Surface Water Ambient Monitoring Program

Q: What is citizen science?

A: It is usually a 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.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: Einstein, Klauber, Franklin

SWAMP
Surface Water Ambient Monitoring Program

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.

SWAMP
Surface Water Ambient Monitoring Program

Citizen Monitoring Origins:

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.

SWAMP
Surface Water Ambient Monitoring Program

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 investment supporting citizen monitoring.

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

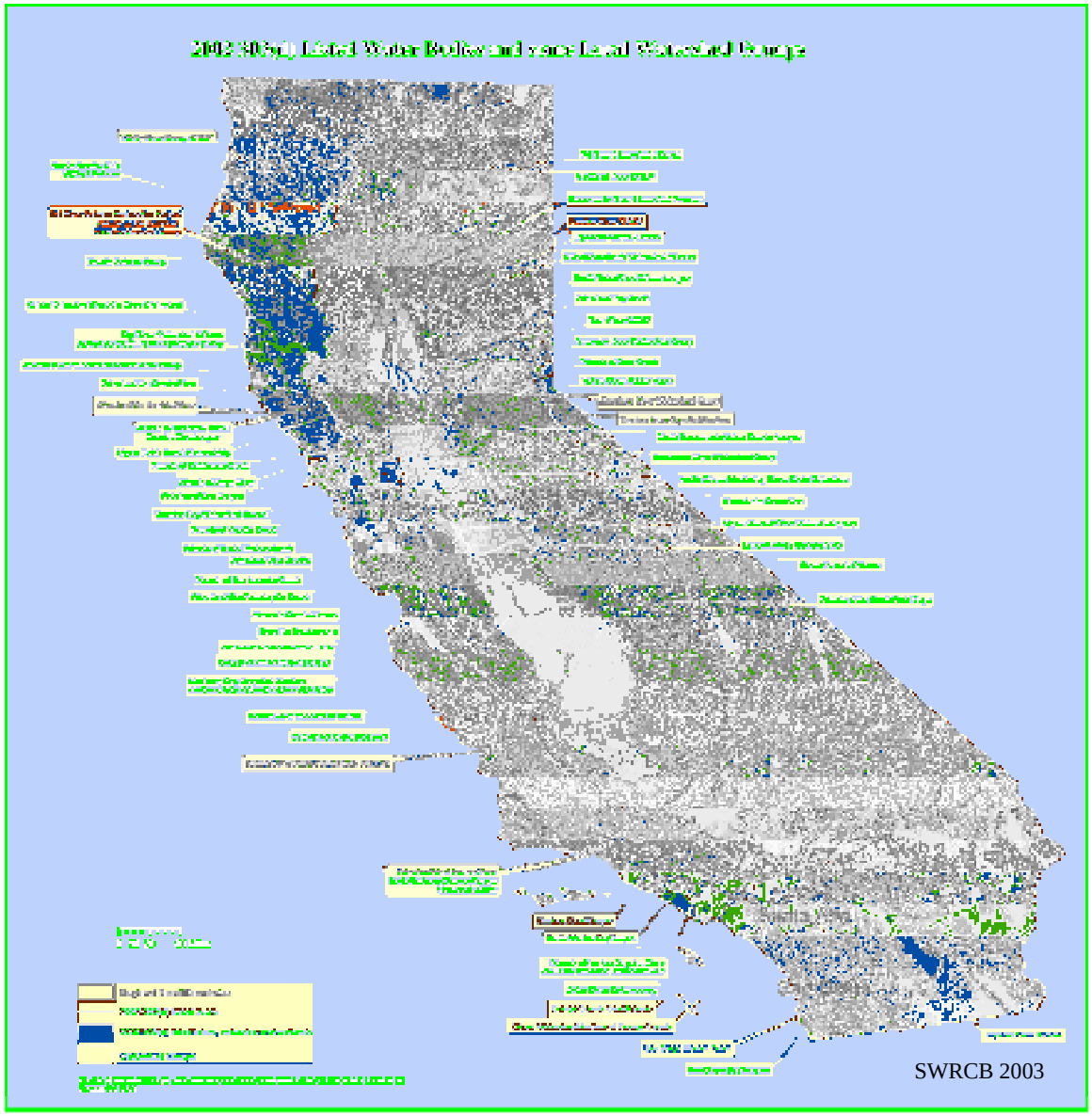
World WATER MONITORING Day

Global Water Watch

A worldwide network of community-based water monitoring groups

SWAMP
Surface Water Ambient Monitoring Program

Summary of Citizen Monitors Statewide



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

In 2009 over 200 citizen monitoring organizations were identified in the State.

SWAMP
Surface Water Ambient Monitoring Program

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

COASTAL WATERSHED COUNCIL
http://www.coastal-watershed.org/

SIERRA NEVADA ALLIANCE

http://www.sierranevadaalliance.org/

SWAMP
Surface Water Ambient Monitoring Program

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……

SWAMP
Surface Water Ambient Monitoring Program

Levels of Citizen Monitoring

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

SWAMP
Surface Water Ambient Monitoring Program

Citizen Monitoring Project Diversity

- Baseline Data Acquisition
- Long Term Monitoring
- Bioassessments
- Stormwater
  - First Flush Monitoring
  - BMP Assessment
- Beneficial Use Attainment Studies
- Water Quality Criteria
- Anti-degradation Measures
  - TMDLs
  - NPS
  - BMPs

- Restoration Projects
- Special Studies
  - Toxicity
  - Swimming/Surfing Beach Investigations
  - International Pellet Watch
  - National Monitoring Day
  - Secchi Dip-In
  - Bight Studies (SCCWRP)
    - Beach Trash
    - Microbiology

SWAMP
Surface Water Ambient Monitoring Program

Myth Buster

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

•Quality Assurance Project Plans Based on EPA and SWAMP guidance are being implemented.

•Inter-calibration exercises are being held

SWAMP
Surface Water Ambient Monitoring Program

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.

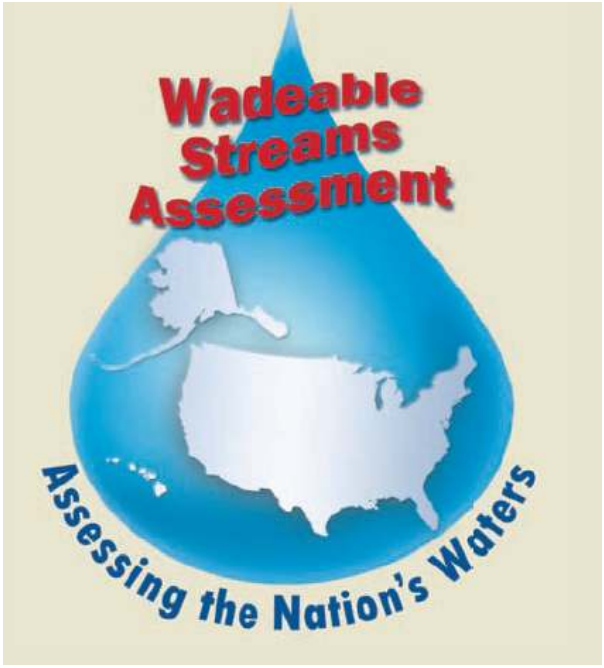
Partnerships:

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

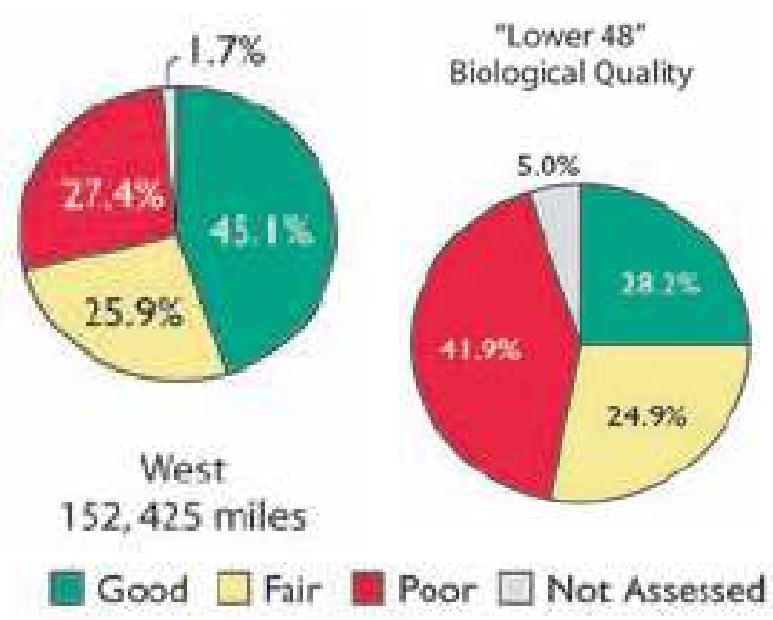
Alexander Graham Bell

SWAMP
Surface Water Ambient Monitoring Program

A Need for Citizen Monitors



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.**



SWAMP
Surface Water
Ambient Monitoring
Program

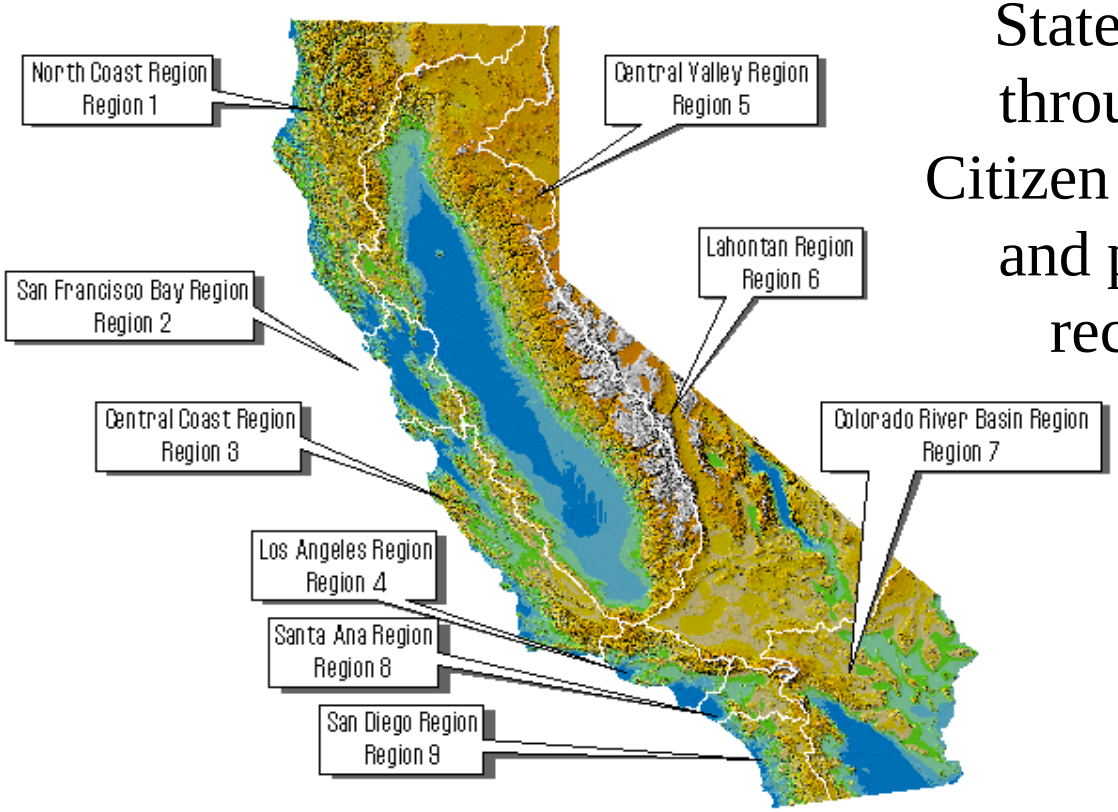
Strategies for Improving Water Quality

- Stakeholder Involvement
  - Watershed Management Initiative
- Science Based Stewardship
  - Production of actionable data
  - Implementation of Adaptive Management Plans
- Citizen Based Communications
  - Awareness
  - Education
  - Action

SWAMP
Surface Water Ambient Monitoring Program

THE CLEAN WATER TEAM

The mission of the Clean Water Team is to build and support the State's Watersheds Stewardship through TMDL 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

SWAMP
Surface Water Ambient Monitoring Program

Clean Water Team Services

Outreach and Communication

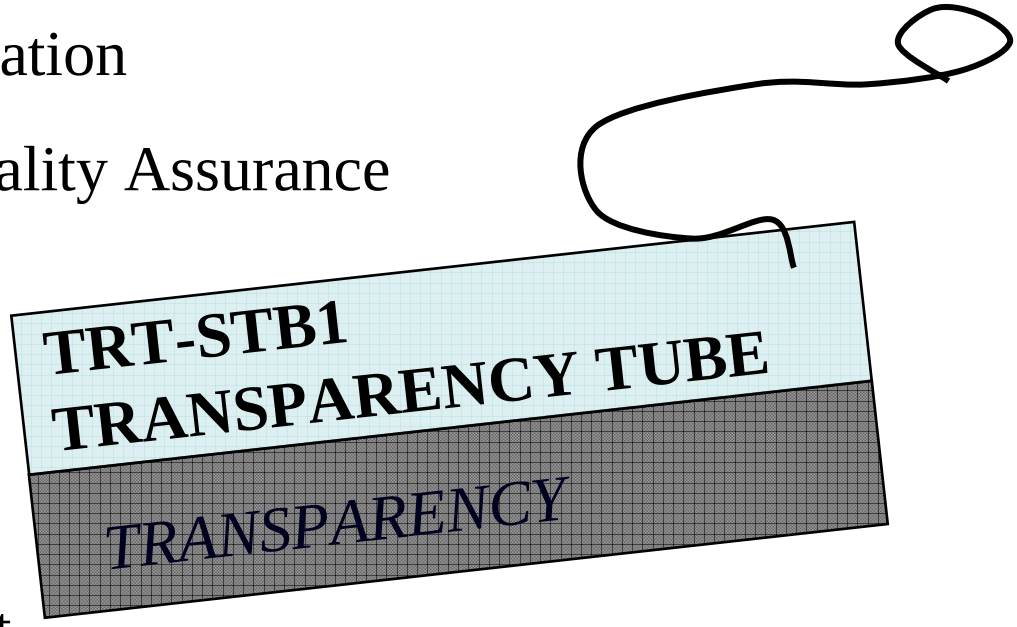
Technical Assistance/Quality Assurance

Training

Equipment Loans

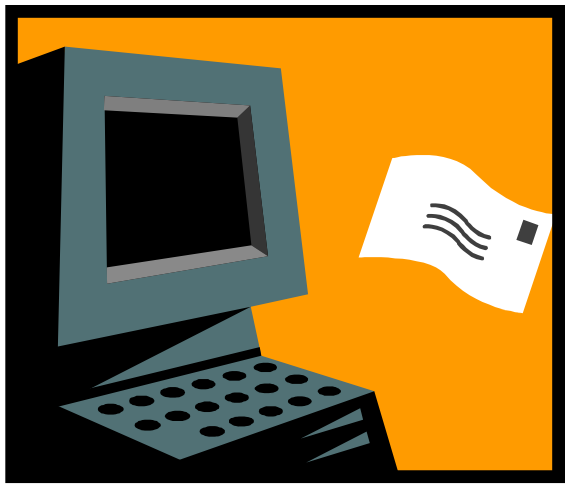
Event Support

Information Management



SWAMP
Surface Water
Ambient Monitoring
Program

Clean Water Team Communication Tools



Self-Subscribe Email Listserve
http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml

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

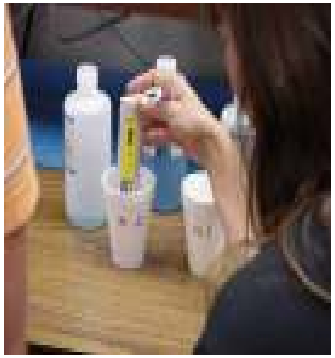
Many Citizens are Monitoring Water Quality. Our goal is to enable them to increase their capacity by sharing programs that work. Join us!

http://ccwinet.ning.com/

SWAMP
Surface Water Ambient Monitoring Program

Technical Assistance

- Programmatic Planning
- Project Development
- Compendium for
  Watershed Monitors
- SOP's
- Safety
- Equipment Loans



SWAMP
Surface Water
Ambient Monitoring
Program

Training

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

SWAMP
Surface Water
Ambient Monitoring
Program

Equipment Loans

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

SWAMP
Surface Water
Ambient Monitoring
Program

Quality Assurance

- SWAMP Field Techniques Distance Learning CD (Free)
- CWT Compendium for Citizen Monitors
- Technical Advisory Committees
- Quality Assurance Project Plans
- SWAMP QA Advisor

  http://swamp.waterboards.ca.gov/swamp/qapp_advisor/
- Inter-Calibrations
- Field Reviews
- 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

SWAMP
Surface Water Ambient Monitoring Program

Information Management

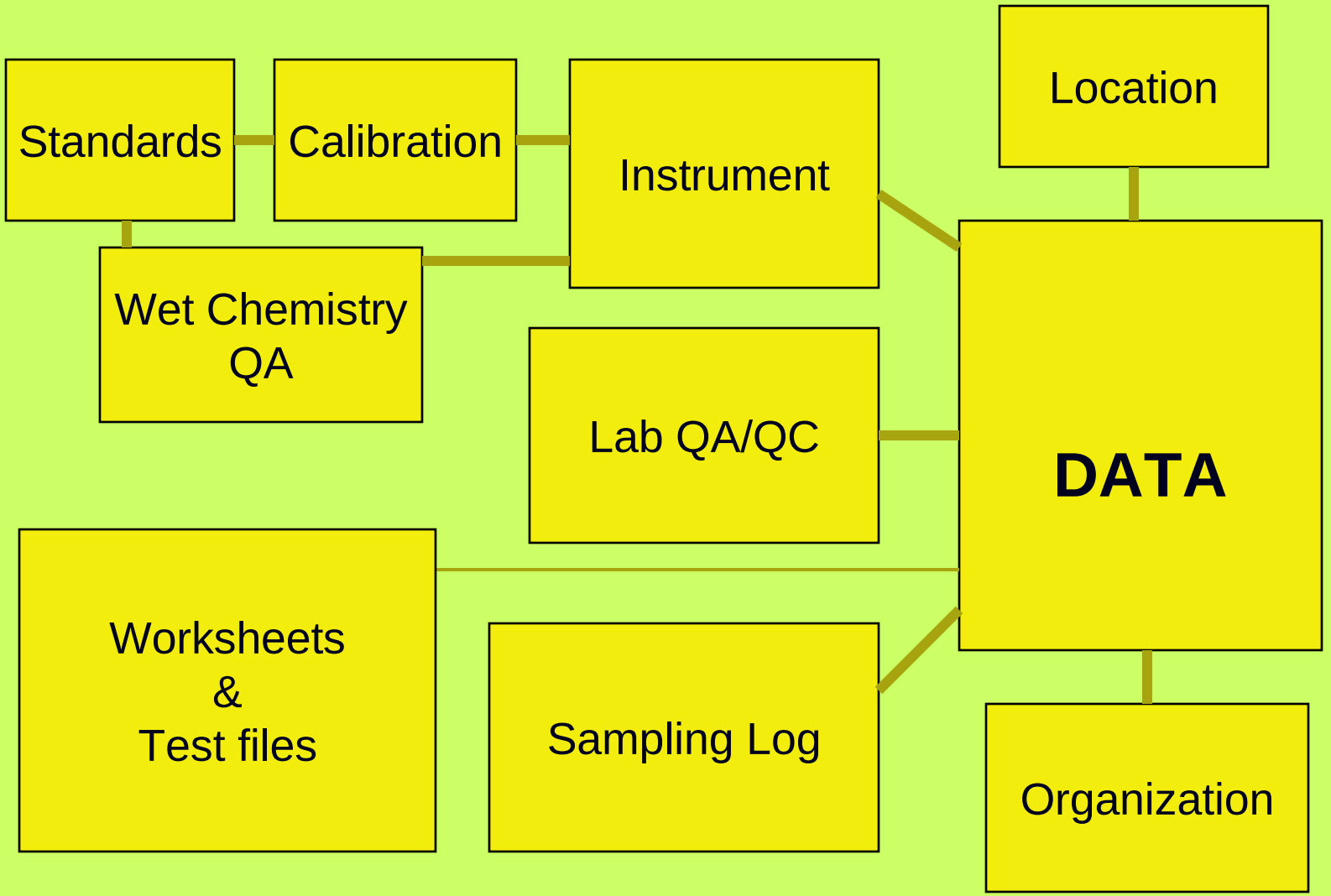
Functions of a Data Management System

- 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. Eliason
San Leandro Creek	Chabot Park	SLC-WD	5/22/99	9:15	4	SLC-WD-e5	H2O Temperature	℃	na	13.5			TR-SLC1	D. Eliason
San Leandro Creek	Chabot Park	SLC-WD	5/22/99	9:15	4	SLC-WD-e5	pH	pH	na	7.6			PHEL-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. Eliason
San Leandro Creek	Root Park	SLC-WC	5/22/99	10:00	3	SLC-WC-e5	H2O Temperature	℃	na	14.5			TR-SLC1	D. Eliason
San Leandro Creek	Root Park	SLC-WC	5/22/99	10:00	3	SLC-WC-e5	pH	pH	na	7.6			PHEL-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



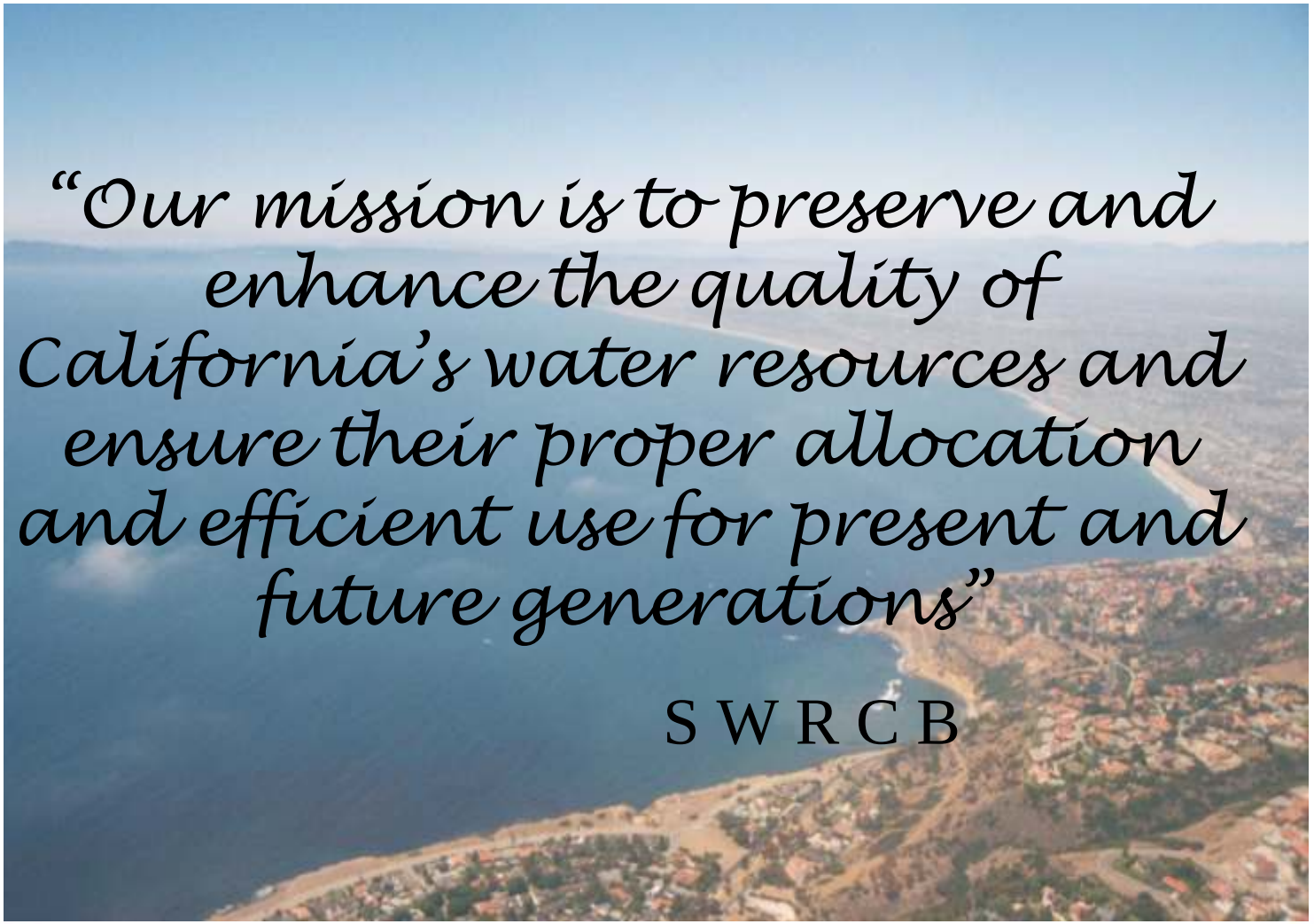
Event Support

- National Secchi Dip-In
- Inter-National Monitoring Day
- Snapshots
- First Flush Monitoring

Secchi Dip-In

SWAMP
Surface Water
Ambient Monitoring
Program

THANK YOU



SWAMP
Surface Water Ambient Monitoring Program