Surface Water Ambient Monitoring Program

Strategy

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Office of Information Management and Analysis

Water Boards

SWAMP Surface Water Ambient Monitoring Program

SWAMP: Required by AB 982

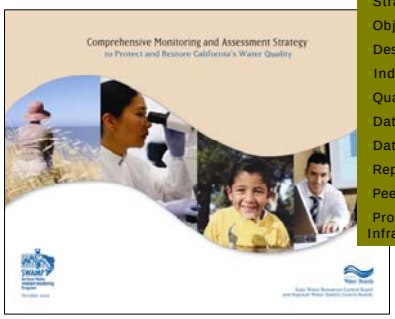
- Comprehensive state program (surface water)
- Coordinate all Board ambient water quality monitoring Programs/projects
- High Quality Data (Quality Assurance)
- Comparable data
- Accessible

SWAMP Surface Water Ambient Monitoring Program

SWAMP Strategy

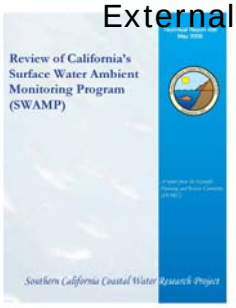
10 Elements of a State Monitoring & Assessment Program:

- Strategy
- Objectives
- Design
- Indicators
- Quality Assurance
- Data Management
- Data Analysis and Assessment
- Reporting
- Peer Review
- Program Support and Infrastructure



SWAMP Roundtable

External Review



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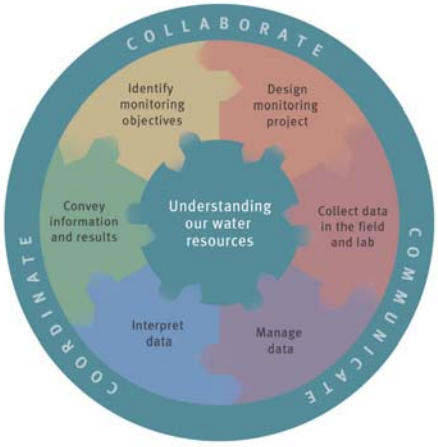
Monitoring Framework



- National Water Quality Monitoring Council

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Implementation Strategy

- Monitoring Program Strategy
- Monitoring Objectives
- Monitoring Design
- Core Indicators of Water Quality
- Quality Assurance
- Data Management
- Data Analysis/Assessment
- Reporting
- Programmatic Evaluation
- General Support and Infrastructure

Mapping SB1070 to SWAMP

1. Monitoring strategy – *Need to coordinate*
2. Objectives
3. Design
4. Indicators
5. QA/QC – "Use appropriate" *QA program*
6. Database – *User friendly electronic database; CEDEN*
7. Assessment – *Consistent methodologies*
8. Reporting – State and regional *reports on water quality*
9. Program Evaluation – SPARC (2009 –2010)
10. Program Support – *Cost of implementation (2009)*

Main components of SWAMP

- State-wide monitoring projects
- Regional monitoring programs
- Water Board Programs
- State-wide "umbrella" (Comparability)

Two Levels of Monitoring

- Statewide programs –
  - Perennial Streams Assessment (PSA)
  - Reference Sites
  - Bioaccumulation Oversight Group (BOG)
  - Integrator Sites
  - Special Studies – Pyrethroids in URO
- Regional Boards –
  - Conduct targeted monitoring and assessment

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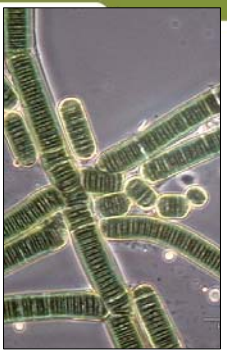
Water Board Programs:

- Stormwater
- NPDES
- 401 Wetlands
- NPS
- Standards
- TMDLs
- Irrigated Lands
- other



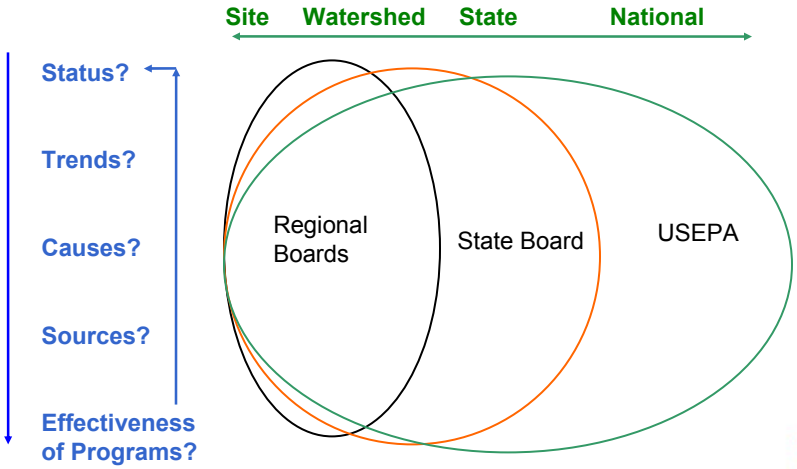
Water Body Type	Beneficial Use			
	"Fishable"	"Swimmable"	"Drinkable"	Aquatic Life
Wadeable Streams		*SWAMP-funded monit summary (2007-08)*		*SWAMP Bioassessment (2005 – ongoing)*
Large Rivers		*SWAMP-funded monit summary (2007-08)*		*EPA Flowing Waters Study (2008-2010)*
Lakes	*SWAMP Bioaccumulation Study (2007-09)*	*SWAMP-funded monit summary (2007-08)*		*USEPA Lakes Survey (2007-2009)*
Coastal Waters	*SWAMP Bioaccumulation Study (2009 – 2010)*	*Clean Beach Program*	*NA*	*ASBS / SQOs*
Bays/ Estuaries		*Clean Beach Program*	*NA*	*SQOs*
Wetlands	*NA*	*NA*	*NA*	*Wetland Monitoring*

2. Monitoring Objectives

- Monitoring objectives are broad
  - Are uses supported?
  - Are waters getting better over time?
  - What are the stressors affecting the uses?
  - Are protection and restoration efforts working?

SWAMP Monitoring Strategy
http://www.waterboards.ca.gov/swamp/docs/cw102swampcmas.pdf

3. Common Questions (vary scale)



Programs needing answers:
Standards, Permits, Nonpoint Source, TMDLs, Drinking water, Groundwater

3. Design: Matching design to scale of question

Probability surveys	• Assessment of background condition (context) • Predict proportion of waters in good or poor condition • Measure broad-scale water quality trends • Prioritize targeted monitoring
Modeling and landscape analysis	• Determine where water quality is likely impaired • Predict water quality trends • Prioritize targeted monitoring
Targeted monitoring	• Assess WQS attainment for specific segments • Measure localized water quality trends • Identify sources of pollutants to specific waters • Support development of local management measures • Assess performance of management measures

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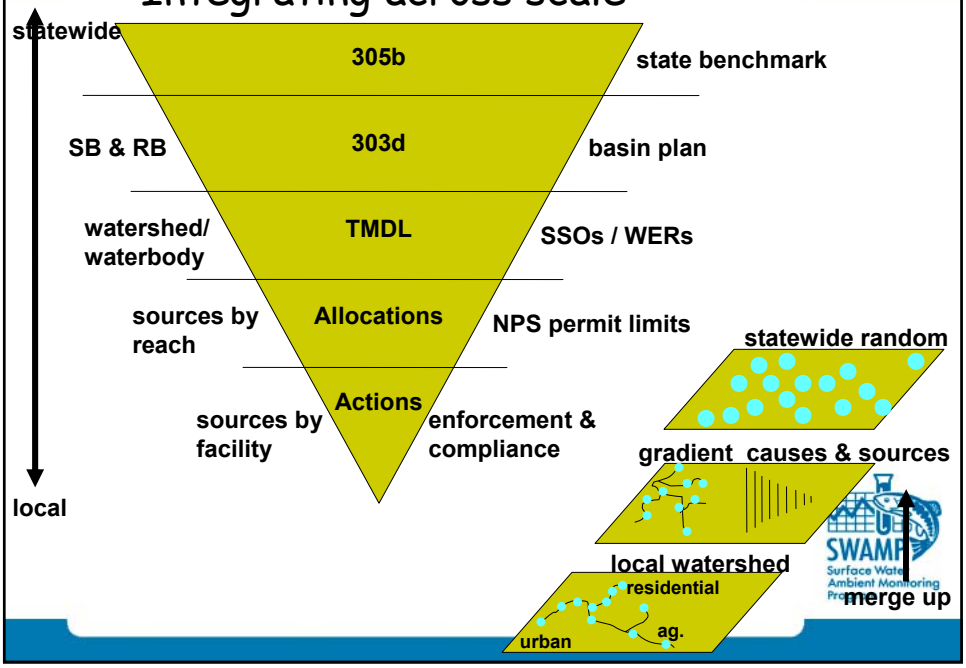
Integrating across scale



Building "Comparability"

- SWAMP is a state framework to coordinate consistent and scientifically defensible methods and strategies for improving water quality monitoring, assessment, and reporting.

- Common Indicators
- Comparable Methods
- Quality Assurance Program
- Database w/ metadata
- Information Exchange Network
- Tool Box and Training

4. Indicators
What Should be Monitored?

	Aquatic Life	Recreation	Drinking Water	Fish / Shellfish
CORE	Biological communities Basic chemistry (e.g. DO, pH) Nutrients Flow Habitat assessment Landscape condition	Pathogen indicators (*E. coli*, enterococci) Nuisance plant growth Nutrients Chlorophyll Flow Landscape condition	Trace metals Pathogens Nitrates Salinity Sediments/TDS Flow Landscape condition	Pathogens Mercury Chlordane DDT PCBs Landscape condition
OTHER	Ambient toxicity Sediment toxicity Toxics in water or sediment Health of organisms	Toxics in water or sediment Hazardous chemicals Aesthetics	Chemicals of concern in water or sediment VOCs (in reservoirs) Hydrophyllic pesticides Algae	Bioaccumulative chemicals in water or sediment

4. Indicators.
How to interpret the results.

- Narrative or numeric expressions of parameters designed to protect designated uses
  - Temp, pH, nutrients (Basin Plans)
  - No toxics in toxic amounts (Basin Plans)
  - Numeric toxic criteria (CTR)
  - Biological criteria: numeric or narrative expressions that describe the "desired" aquatic communities inhabiting a waterbody.
  - Habitat, Flow and Landscape?

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Data Management

- SWAMP-generated data in SWAMP database
- Standardized data formats
- Publicly accessible thru California Environmental Data Exchange Network http://bdat.ca.gov

Moss Landing Marine Laboratories
www.mlml.calstate.edu

Quality Assurance

- Progressive and systems-based
- Quality assurance systems: QA Program Plan, SOPs, etc.

Tools for Data Comparability

- available at www.waterboards.ca.gov/swamp
- next steps: tiering QA

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5. QA/QC – Protocols, Field and Laboratory methods

Chemistry

Usually well documented field and lab methods

- SWAMP SOPs for field measurements and collection of water and bed sediments

- SWAMP Chemistry performance based approach

Biology and Physical Habitat

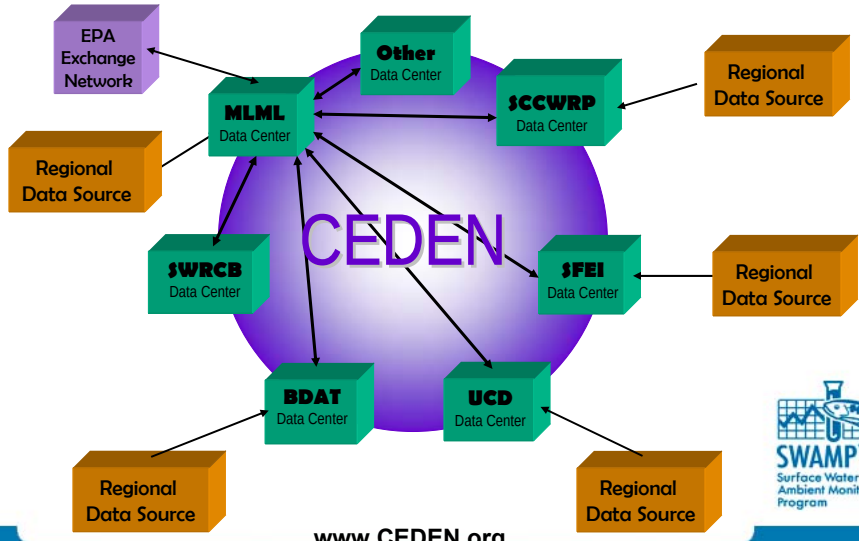
Usually well documented field and lab methods

Sometimes multiple methods (standardization an issue)

Methods vary by waterbody type

- SWAMP SOP for collection of benthic marcorinvertebrate samples and associated physical and chemical data for ambient bioassessments in California

California Environmental Data Exchange Network (CEDEN)



www.CEDEN.org

Conveying information

- Identify target audiences
- Develop communications strategy
  - communications coordinator
- Develop signature products
  - newsletters, fact sheets, assessment reports, listserv, website
  - http://www.waterboards.ca.gov/swamp/reports.html

Accessible information to support sound decision-making

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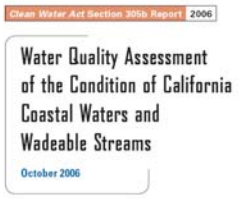
8. Reporting in California

- 2006 305(b) Report Coastal Waters and Wadeable Streams
- 2007 Sediment Quality Report for Bays and Estuaries
- 2008 305(b) Report on Coastal Wetlands
- 2009 305(b) Report on Fish Tissue in Lakes



Water Boards

State Board Websites

- SWAMP Homepage
  http://www.waterboards.ca.gov/water_issues/programs/swamp/
  - *SWAMP Monitoring Strategy*
  - *SWAMP Interpretive Reports (including narrative 305(b) Reports)*
  - *SWAMP Field Manual*
  - *SWAMP Bioassessment Procedures*

- SWAMP QA/QC Program
  http://www.waterboards.ca.gov/water_issues/programs/swamp/qapp.shtml

- SWAMP Data Management procedures
  http://www.waterboards.ca.gov/water_issues/programs/swamp/datamgmt.shtml

Questions?

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http://www.waterboards.ca.gov/swamp

SWAMP Monitoring Sites

SWAMP statistics (SWAMP database)

Watersheds assessed (CalWater HUC)	150
Stations Sampled	1,835
Station Visits	34,440
Field Measures taken	75,700
Chem. analyses	564,900
Toxicity. tests	81,500
Organism Collected	4,520
Tissue Results	8,500
Biological Assessments	1788

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