California's Surface Water Ambient Monitoring Program
Central Valley Region

Program Overview
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Presentation Overview

1. Background
2. Central Valley SWAMP: 2000 to 2005
3. Program Re-Evaluation
4. Post 2007 and Moving Forward
   - New Coordination Tool Demo
5. Available Resources

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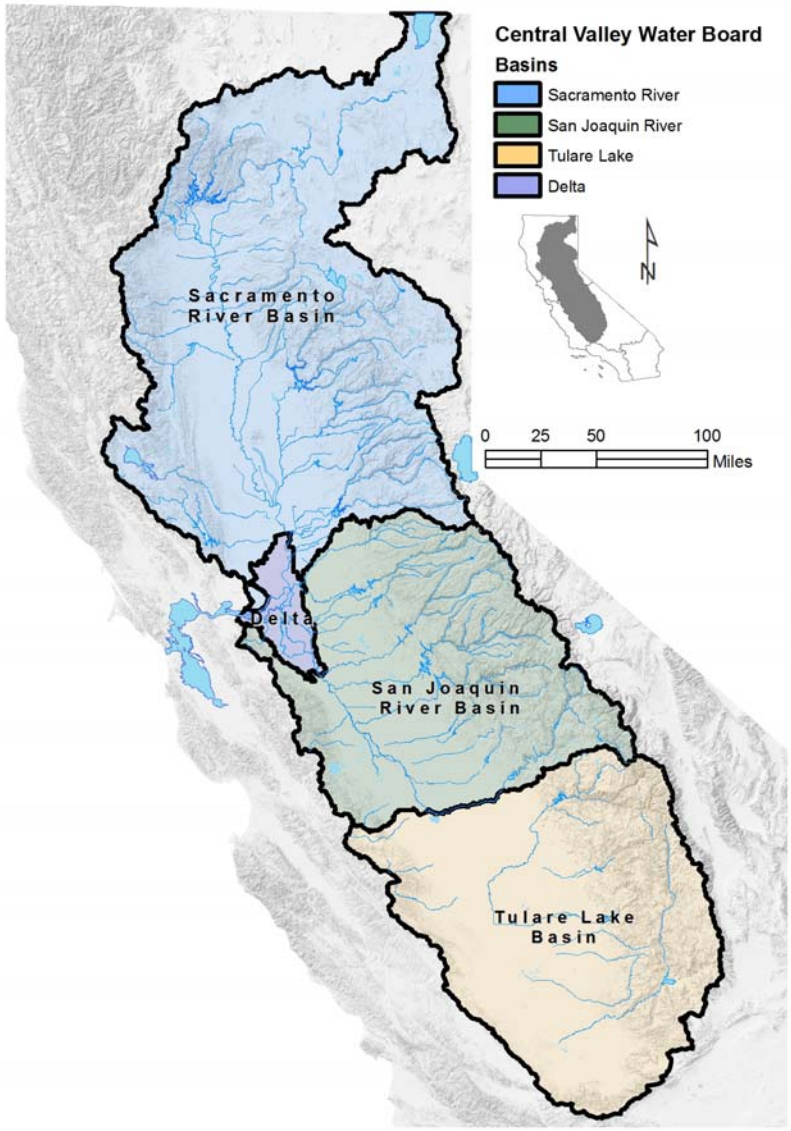
Overview of the Central Valley Region



40% land surface

>50% managed water supply

77% irrigated agriculture

3-Distinct Basins

→ Plus the Delta ←

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Central Valley Region Facts

Estuaries	**43,991 acres**
Lakes, Reservoirs, & Ponds	**504,350 acres**
Wetlands	**11,007 acres**
Bay Shoreline	**29 miles**
River and Streams	**83,624 miles**

Irrigated Agriculture	**9-million acres**
Ag Dominated Natural Water Bodies	**160 (1,512 miles)**
Constructed Agricultural Drains	**6,319 (19,812 miles)**

Shasta-Sierra Nevada-Coast Range-Valley Floor-Delta-Lake Bed

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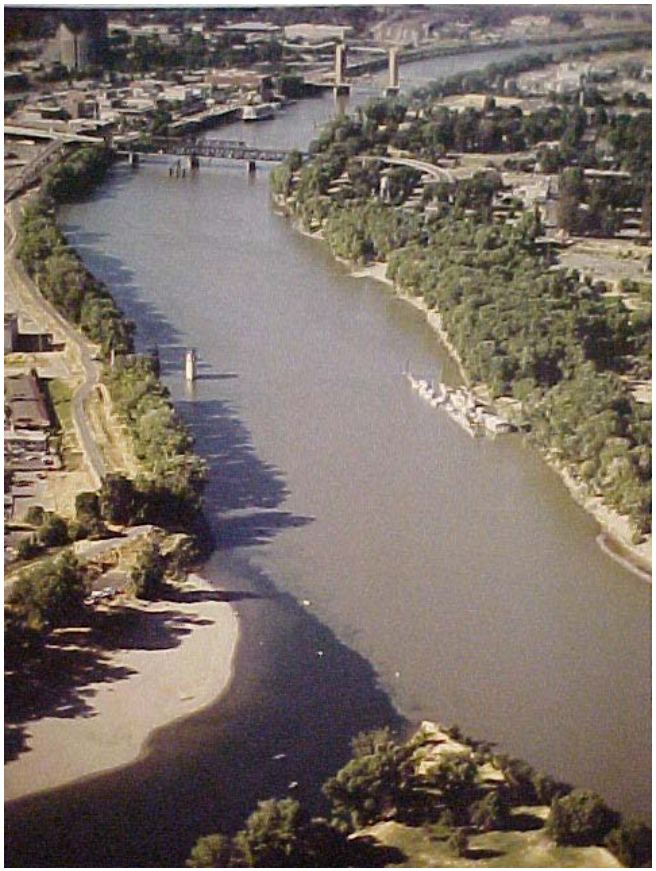
Central Valley Region Water Quality Issues



- **Inherent/Management**
  - **Water Exports**
  - **Over Appropriation**
  - **Closed Basin**
- **Nonpoint Source**
  - **Irrigated Ag**
  - **Timber**
  - **Grazing**
  - **Abandoned Mines**
- **Urban/Industrial**
- **CAFO**

Water quality issues differ throughout the Region

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Central Valley SWAMP Goals

- Evaluate ambient water quality, beneficial use protection and potential sources of impairment.
- Evaluate effectiveness of the Water Board water quality improvement policies.
- Coordinate internal and external monitoring efforts to leverage limited resources.
- Provide timely availability of monitoring results to the public.

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Central Valley SWAMP: 2000-2005

Four Distinct Sub-basins:

- Unique characteristics
  - -Seasonal variability
- Diverse water quality issues
- Variety of existing monitoring frameworks

Central Valley SWAMP Resources/Approach

Annual Resources
(2000-2005)

- Allocated 2-staff
- Contract funding:
  - $70,000 - $800,000

Overall Sub-basin structure built around existing monitoring frameworks and programs

- Internal/external coordination
- Leverages limited resources
- Flexibility
- Facilitates information exchange

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Sub-Basin Designs: 2000-2005

- Sacramento River Basin (SRWP)
  - Upper
    - Support Local Watershed Management Partnerships
  - Lower
    - Fill Data Gaps in Sub-basins/Targeted Studies
- San Joaquin River Basin (GBP)
  - Integrator sites: long-term; rotating
  - In-house *E. coli* analysis
- Tulare Lake Basin (Limited)
  - Baseline Integrator sites: upper watershed; lower eastside
- Delta (Extensive multi-agency)
  - Targeted studies: TMDL support

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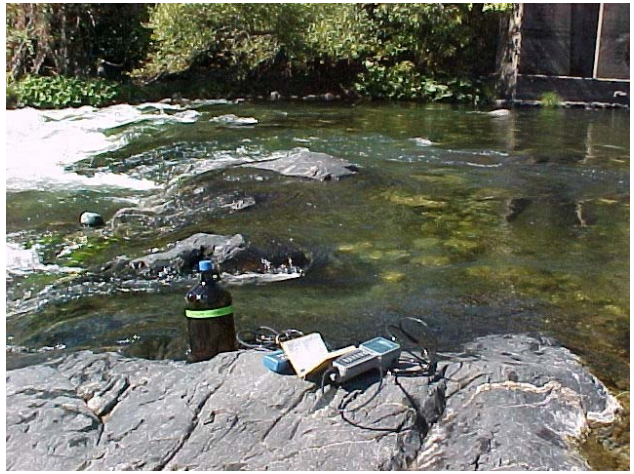
Key Indicators to Assess Beneficial Uses

- Aquatic Life
  - Temperature, DO ,Turbidity, Water Column Toxicity
  - (Bioassessment/Sediment toxicity)
- Drinking Water
  - Salt, Organic Carbon, Bacteria
  - (Nutrients)
- Recreation
  - Bacteria
- Irrigation Water Supply
  - Salt, Boron, Minerals
- Waterfowl
  - Selenium



More limited: Trace Elements, Nutrients, Fish Tissue, Specific Chemicals (e.g. pyrethroids and mercury)

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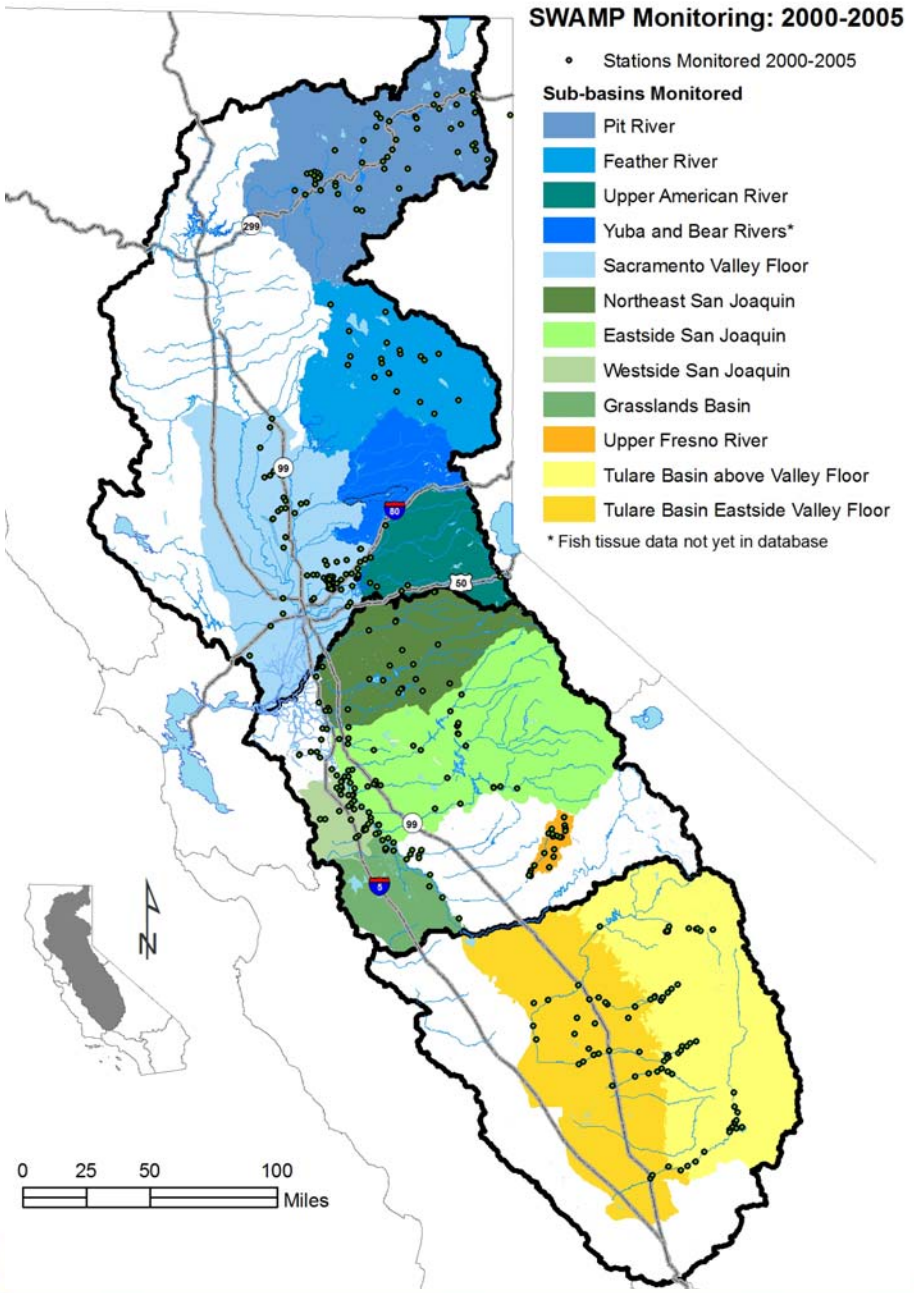

Accomplishments: 2000-05

- Sampled 394-sites
- Sampled 171-water bodies
- Covered ~75% of Region
- Developed/reviewed 15-technical reports
- Developed website for data access
- Developed in-house *E. coli* analytical capabilities
- Supported multiple TMDLs
  - Salt, selenium and boron
  - Mercury
  - Toxicity

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Key Findings: 2000-2005

- Watershed Assessments
  - Unknown toxicity in sub-watersheds
  - Sediment toxicity/pyrethroids
  - Elevated *E. coli* Region-wide
  - Elevated Total Organic Carbon
- Special Studies
  - Urban creeks toxicity (water and sediment)
  - Endocrine Disrupting Chemicals
  - Fresno River Nutrients
- New Tools
  - Analytical Improvements: pyrethroids; TIE's
  - Bioassessment data used by DFG for preliminary Central Valley IBI

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By June 2005

- Binders of data
  - 394-sites
  - Variety of parameters (field, chemical, toxicity, water, sediment, bioassessment)
  - Daily, weekly, seasonally, monthly, annually, episodic events
- Behind in data assessment
  - Technical Reports
- Behind in entry to SWAMP Master Database
  - Most data on Region 5 SWAMP website

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July 2005 – June 2007

- Refocused Contract Allotments
  - Project Assistant: Data Manager
    - Caught up Backlog of Data Entry Dec. 07
  - Project Assistant: Sampling and Logistics
    - Maintained Key Partnerships/Ongoing Monitoring Efforts
  - Students
    - Field and Data Entry
- Staff Efforts
  - Assessed Developed Data
    - Additional 12-technical reports
  - Managed Ongoing Contracts
    - Laboratory and special studies
  - Re-evaluate Region 5 SWAMP Framework

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Re-Evaluate 2005/2006

- Overall SWAMP Program Review
  - SPARC Review
- Internal staffing changes
- Highly staff intensive
- New Monitoring Efforts and Priorities
  - Irrigated Lands Regulatory Program
  - Delta POD
  - Statewide Strategy and Assessment Framework

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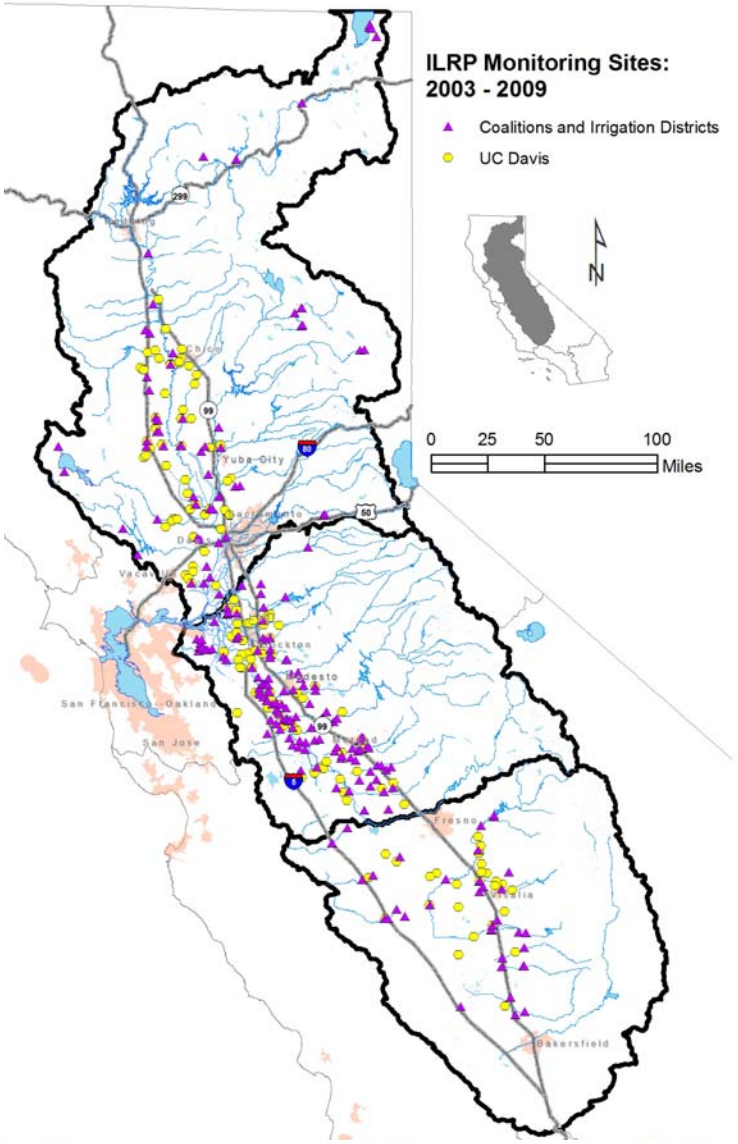
ILRP Monitoring Initiated in 2003



Calendar Year	Number of Sites
2003	24*
2004	91*
2005	152*
2006	131
2007	175
2008	156
2009	104

*Includes UCD studies

<u>Monthly Monitoring</u>

- General parameters
- Nutrients
- Trace Elements
- Pesticides
- Water Column Toxicity
- Limited Sediment Toxicity

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Delta Water Quality

- 2006: Water Quality Control Plan for the Bay-Delta
  - Identifies POD as one of four emerging issues
- 2007-2008: Joint Delta Actions Resolution
  - Identifies short and long term actions
- 2008: Strategic Workplan
  - Provides scope, timelines, and resource needs for individual actions
    - Element 1: Water Quality and Contaminants Control
    - Element 2: Comprehensive Monitoring Program
      - ✓ Kick-off Meeting in September 2008

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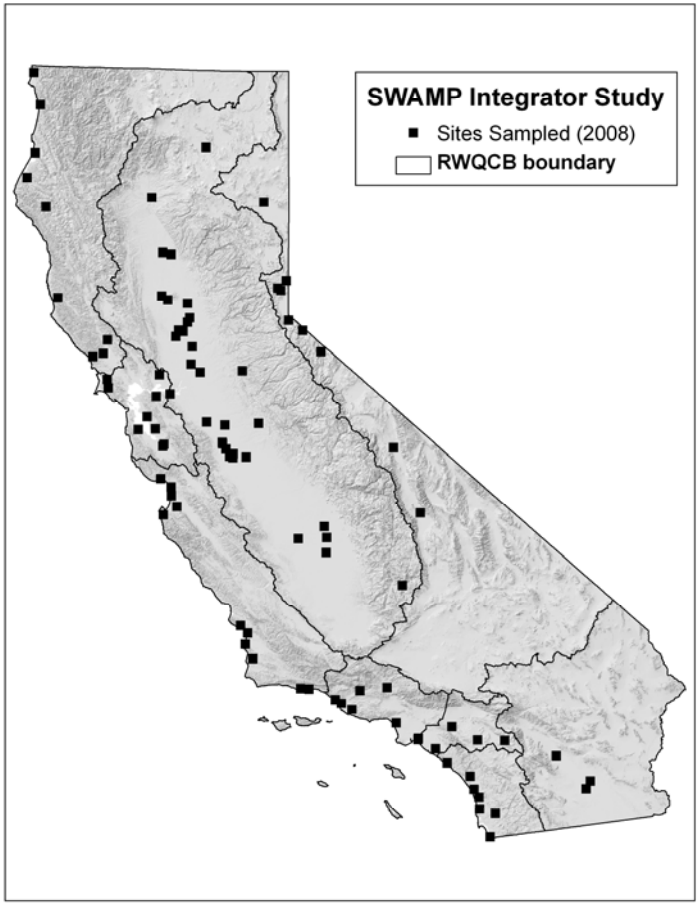
Statewide SWAMP SPoT



Stream Pollution Trend Study

- ~100-sites annually
- Downstream Integrator Sites
- Sediment Analyses
  - Toxicity
  - Grain Size
  - Organic Carbon
  - Metals
  - Pesticides (pyrethroids)
- 30-sites within the Central Valley

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Post 2007. . .

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Post 2007: Re-emphasized Goals

1. Timely availability of monitoring results
2. Evaluate ambient water quality, beneficial use protection and potential sources of impairment.
3. Evaluate effectiveness of the Water Board water quality improvement policies.
4. Coordinate internal and external monitoring efforts to leverage limited resources.

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Post 2007: Re-emphasized Goals

1) Timely availability of Monitoring Results

- Contracted Data Manager
  - Data in SWAMP database w/in 30-days of QA review
- Updated Region 5 SWAMP web page
- Use of Fact Sheets in Coordination with Technical Reports
- 2010 Integrated Report

Water Bodies	SWAMP (only)	SWAMP (plus)	Total
Assessed	65	70	135
Listed	25	60	85
De-listed	6	1	7

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Post 2007: Re-emphasized Goals

2) Evaluate ambient water quality, beneficial use protection and potential sources of impairment.

3) Evaluate effectiveness of the Water Board water quality improvement policies.

Seasonal Trend Monitoring at Central Valley Integrator Sites

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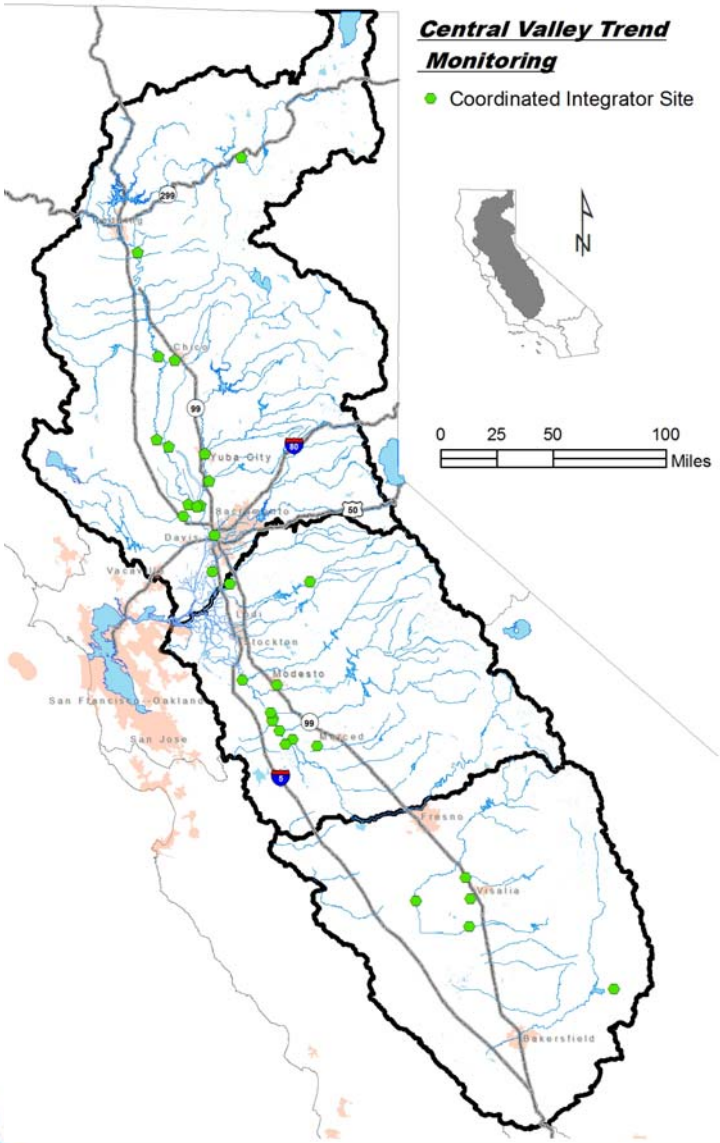
Seasonal Trend Monitoring



- 30 sites (SPoT)
  - 11 sites coordinated with DWR
  - Selected urban areas
- Seasonal monitoring (4/year)
- Water chemistry
  - Field measures (EC, pH, DO, temp)
  - Organic Carbon (total, dissolved)
  - *E. coli*
- Water column toxicity for 1 year
- Provides a consistent framework of specific parameters that can be expanded or built on
  - Additional parameters
  - Increased frequency
  - Source identification

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Post 2007: Re-emphasized Goals

4) Coordinate internal and external monitoring efforts to leverage limited resources.
   - Internal
     - Support ILRP Data Management
       - ✓ Movement to SWAMP comparable database
     - Integration Between Basins
       - ✓ Safe to Swim

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A More Integrated Program: Safe to Swim

Assess whether Central Valley swimming holes are safe to swim in before, during, and after a popular recreation weekend.

1. 2007 Labor Day Pilot Study
   - 2 watershed groups
   - 15 swimming holes
2. 2008 Labor Day Study
   - 21 watershed groups
   - 57 swimming holes

USEPA's *E. coli* guideline for full contact recreation is 235 MPN/100 mL

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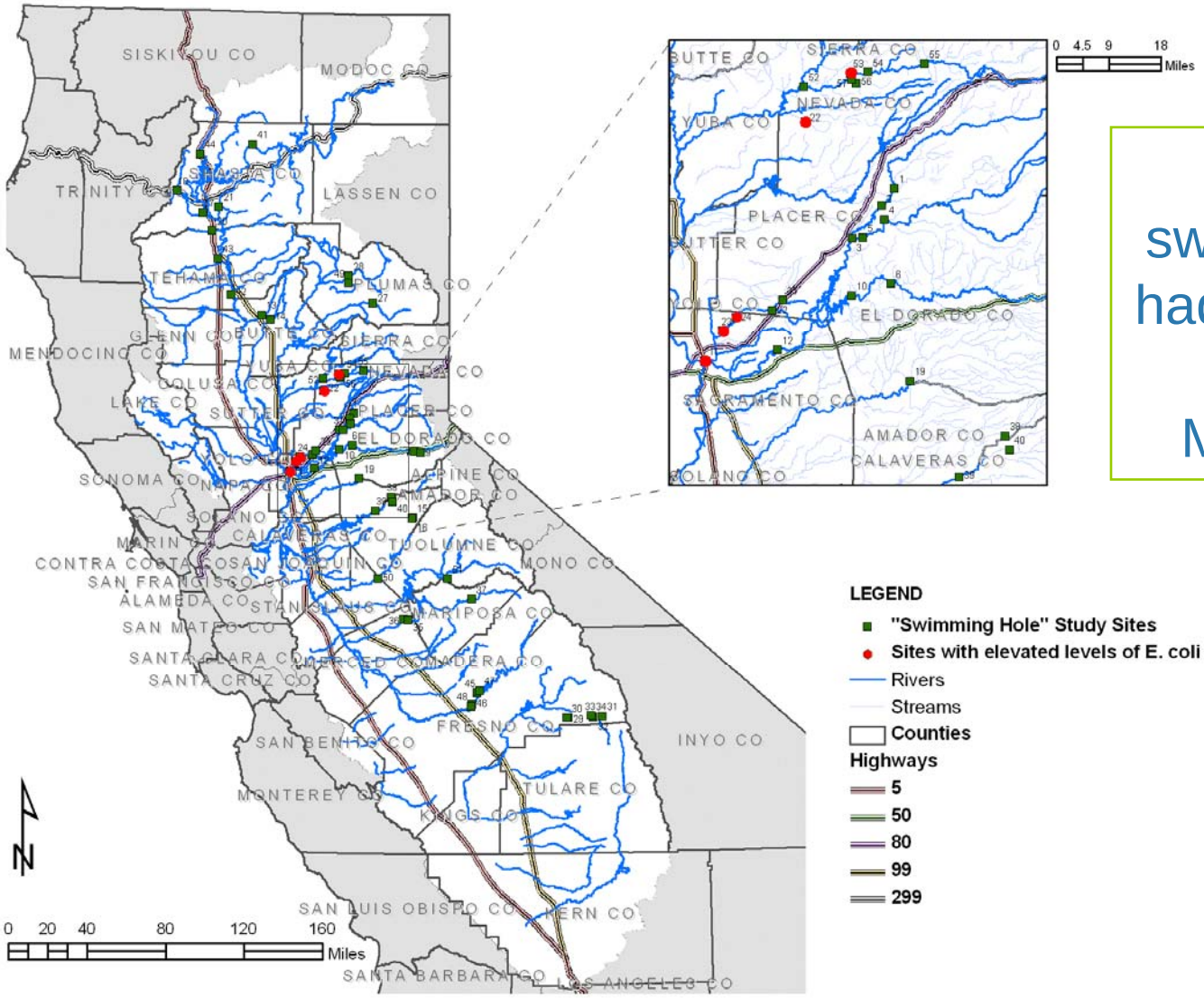
Safe to Swim 2008



5 out of 57 swimming holes had *E. coli* levels above 235 MPN/100 mL

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Safe to Swim 2009

- 2 watershed groups
- 17 sites in 4 watersheds
- Pathogens:
  - E. coli O157:H7
  - *Cryptosporidium*
  - *Giardia*
  - *Salmonella*
- Two watersheds had detectable levels of *Cryptosporidium*
- One watershed had detectable levels of *Giardia* and *Salmonella*.

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Post 2007: Re-emphasized and New Goals

4) Coordinate internal and external monitoring efforts to leverage limited resources.
   - Internal
     - Support ILRP Data Management
       - ✓ Movement to SWAMP comparable database
     - Integration Between Basins
       - ✓ Safe to Swim
   - External
     - Delta RMP
     - DWR Northern District
     - Coordination Tool
       - ✓ Web-based Monitoring Directory

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Coordination: Delta RMP

0.5 PY for coordination of RMP effort

- Stakeholder meetings
  - Kick-off meeting September 2008
  - Five Stakeholder work groups
- Short-term goal (1-2 yrs): establish a framework for regularly gathering, compiling, assessing, and reporting readily available data
  - Summary of Current Water Quality Monitoring Programs
    - 22 entities
    - 18 long term monitoring plans
  - Contaminants Synthesis Report

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Coordination: Delta RMP

- Long-term goal (3-5 yrs): develop a Regional Monitoring Program
- Monitoring and Tool Development
  - Sources and Toxicity of Pyrethroids
  - Mixture toxicity of key contaminants
  - Methods for extracting and identifying organic chemicals in toxic sediments
  - Toxicity in Cache Slough Complex

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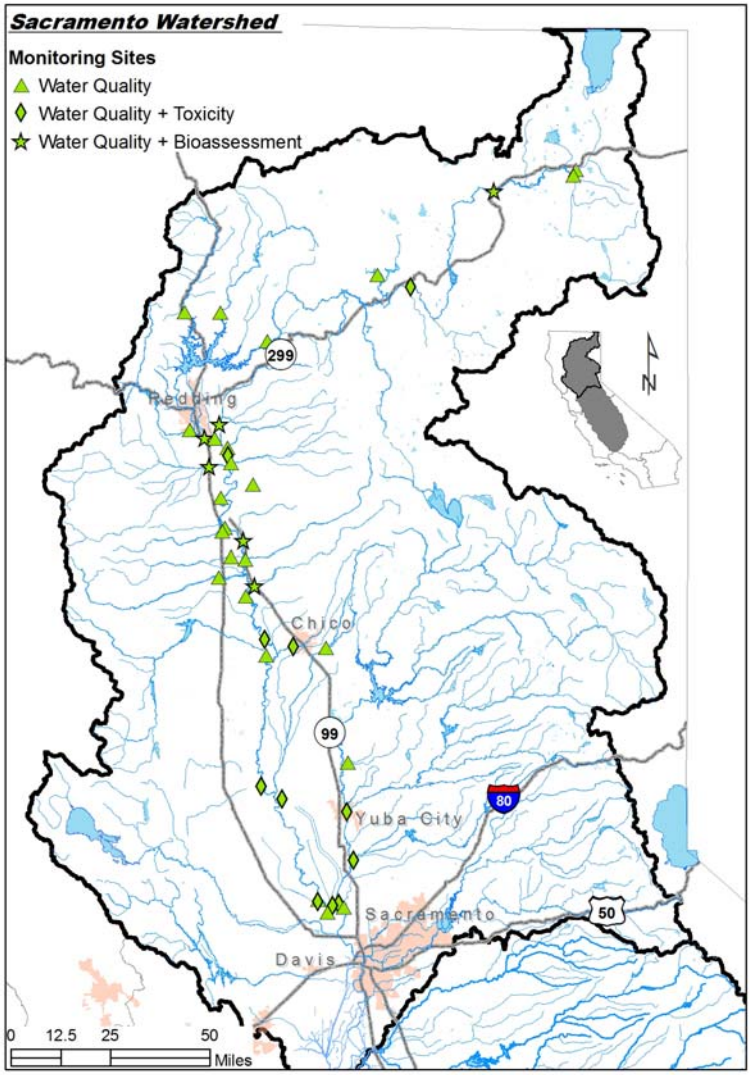
Coordination: DWR Northern District



- Collaborative monitoring with DWR Northern District initiated February 2009
- 41 sites on main stem of rivers and near mouth of tributaries
  - 11 sites coordinated with SPoT
- Seasonal monitoring (4/year)
- Water chemistry
  - Field measures, nutrients, metals, minerals, *E. coli*, TOC/DOC, TSS
- Water column toxicity (1st year) and bioassessment at select sites

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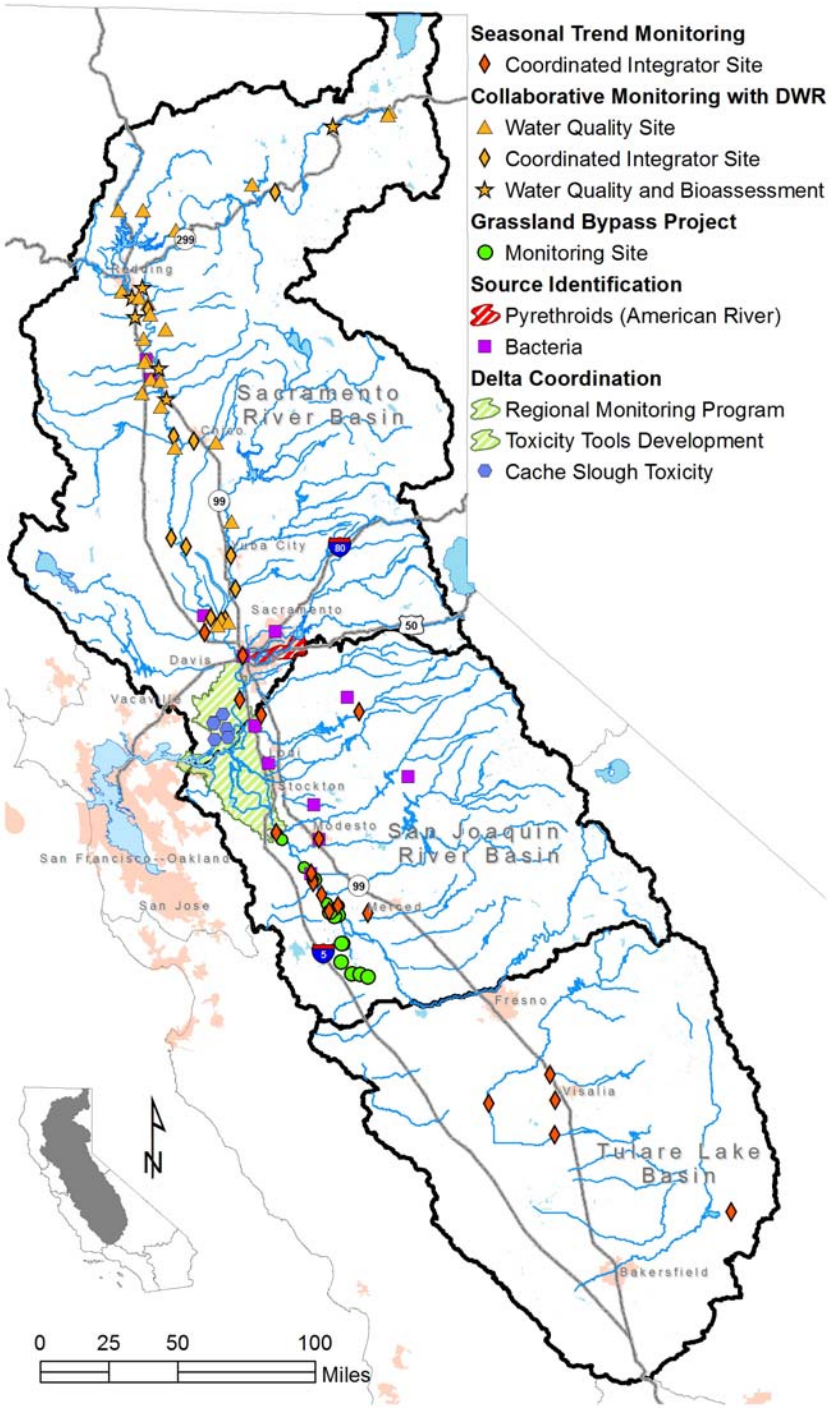

Summary of Current Efforts

Monitoring

- 6 monitoring projects
- 88 monitoring sites
- 54 water bodies
- ~13 entities involved

Toxicity Tools

- 2 tools development projects

Delta RMP*

- 22 entities involved
- 18 long-term monitoring plans

*Based on draft monitoring summary

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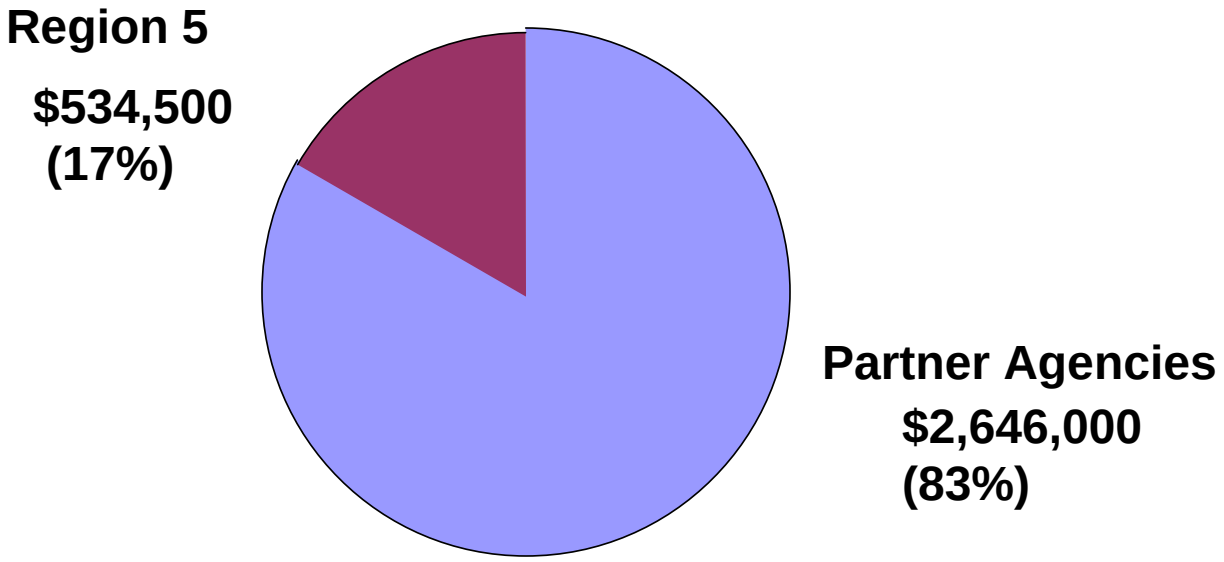
SWAMP Partnerships FY08/09

Collaborative Monitoring

- DWR Northern District
- Grassland Bypass Multi-Agency
- Safe to Swim Monitoring

Leveraging $3.2-mil Annual Contract Resources



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Web-Based Monitoring Directory

Expanded to the Central Valley:

- Provide monitoring program information and metadata
- Customized searches
- Interactive map
- Password-protected domain for program managers to enter and update their project information

→Demo of Development Version←

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Central Valley SWAMP: 2005-2010

- Data management
- Initiated Central Valley trend monitoring
  - Builds off of statewide contaminants trend study
- Source Identification Studies
  - Delta Pyrethroid Toxicity
  - American River Toxicity
  - Bacteria Source ID

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Central Valley SWAMP: 2005-2010

- Focus on coordination
  - Grassland Bypass Project
  - Delta RMP
  - DWR Northern District
  - Safe-to-Swim Assessments
  - ILRP
  - Web-based Monitoring Directory
- Support for 2010 Integrated Report
- Tool Development
  - Toxicity mixing studies
  - Sediment TIE procedures
  - Data for preliminary Central Valley IBI

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Central Valley SWAMP: 2010 and forward

- Continue Central Valley trend monitoring to maintain a region-wide framework
- Continued support for coordination efforts
  - San Joaquin River Restoration Program (new)
- Rotate through basins to address local priorities (including source identification)
  - 2009-10: Lower Sacramento & Delta
  - 2010-11: Tulare Lake Basin
  - 2011-12: Sacramento Basin
  - 2012-13: San Joaquin Basin
- Special Studies as Warranted
  - Follow-up SPoT toxicity
  - Cyanotoxins in selected lakes
  - Follow-up to statewide lake bioaccumulation report

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Available Resources

Website:
http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_studies/surface_water_ambient_monitoring/index.shtml

- Monitoring Plans
- Reports
- Fact Sheets
- Monitoring Data
  - Currently available for San Joaquin through 2009
  - Will expand to include all basins data this year

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Questions?

Program