



## BACKGROUND

In 2009 the California Regional Water Quality Control Board, Central Valley Region and the Department of Water Resources (DWR) Northern District began a collaborative monitoring program in the Upper Sacramento River Watershed of Northern California. The Central Valley Water Board is leveraging Surface Water Ambient Monitoring Program (SWAMP) funding to maintain and expand long-term DWR trend monitoring that had been threatened with severe budget cuts. The collaborative effort allows seasonal monitoring at 41 sites and the addition of key constituents of interest. The monitoring sites include ten stations along the Sacramento River main-stem, five stations on the Pit River, and 26 stations near the mouth of key tributaries. Monitoring constituents include physical parameters, metals, and nutrients. SWAMP funding has made possible the addition of *E. coli*, organic carbon, Kjeldahl nitrogen, and, at select sites, water column toxicity and benthic macroinvertebrates.

In addition, the project is linked to and supports efforts to assess spatial and temporal trends throughout the Central Valley, including:

- Seasonal Trend Monitoring at Central Valley Integrator Sites: In 2009 the Central Valley Water Board SWAMP began collecting water chemistry and toxicity information at the 30 Central Valley Integrator sites four times per year. Eleven of the sites are being monitored by DWR through the collaborative program in the Sacramento Watershed.
- Stream Pollution Trends: In 2008 SWAMP began a study to monitor trends in sediment toxicity and chemistry at approximately 100 integrator sites throughout California, including the 30 trend sites in the Central Valley. Data is collected from each site on an annual basis.
- Perennial Stream Assessment: Expanding the bioassessment data set for future statewide biocriteria development.

## SWAMP Comparability

SWAMP has developed guidelines and tools to ensure data are of known quality to facilitate data exchange between programs and agencies. This program follows SWAMP quality assurance guidelines and has a SWAMP-approved monitoring plan and quality assurance program plan. Benthic macroinvertebrate sample collection also follows SWAMP standard operating procedures. SWAMP comparability will help determine data quality and simplify the process of combining and comparing different datasets.

## For More Information

Contact: Alisha Wenzel, Central Valley SWAMP Coordinator, at 916-464-4717 or awenzel@waterboards.ca.gov

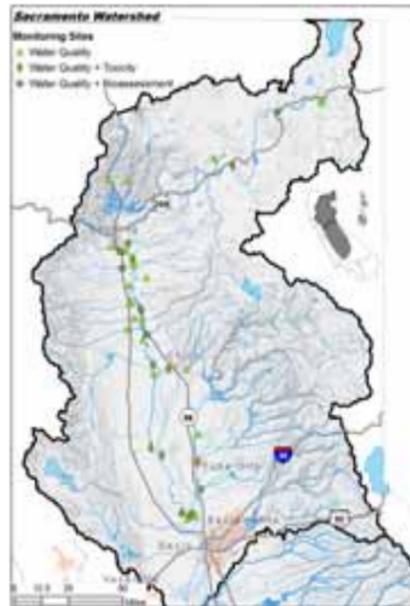
Visit our website:

[http://www.swrcb.ca.gov/centralvalley/water\\_issues/water\\_quality\\_studies/surface\\_water\\_ambient\\_monitoring/index.shtml](http://www.swrcb.ca.gov/centralvalley/water_issues/water_quality_studies/surface_water_ambient_monitoring/index.shtml)

# Collaborative Trend Monitoring of Ambient Water Quality In the Upper Sacramento River Watershed

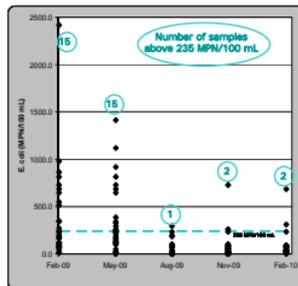
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## Initial Findings

### *E. coli* Values for Each Field Run



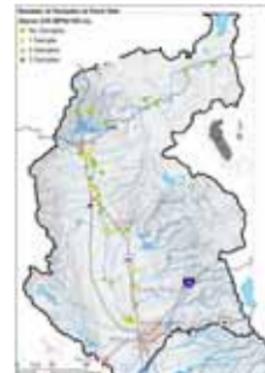
## Example: Safe to Swim?

All water bodies sampled have contract recreation designated as a beneficial use. For this project, *E. coli* is used as a pathogen indicator to assess whether there is any indication that the water bodies are not safe to swim in. The US EPA's recommended full contact recreation limit for *E. coli* is 235 MPN/100 mL. The graph on the left shows the temporal distribution of *E. coli* results. The map on the right shows the spatial distribution of *E. coli* results.

Initial findings include:

- The majority of the samples above 235 MPN/100 mL occurred during February and May of 2009.
- There have been no samples above the guideline upstream of Shasta Lake.
- Downstream of Shasta Lake, 25 of the 33 sites have had at least one sample above the guideline.
- Eight of the ten sites on the main stem of the Sacramento River have had at least one sample above the guideline.

More complete assessments of all beneficial uses will be available in the annual reports. The first annual report is expected to be released by the end of 2010.



## Monitoring Parameters as Indicators for Beneficial Uses

PARAMETER	AQUATIC LIFE	SWIMMING	DRINKING WATER	AGRICULTURE
Temperature	☑			
Dissolved Oxygen	☑			
pH	☑	✓	☑	✓
Conductivity	✓		✓	☑
Turbidity	☑	✓	✓	✓
Total Suspended Solids	☑	✓	✓	✓
Organic Carbon	✓		☑	✓
Nutrients	☑		☑	✓
Metals	☑		✓	✓
Minerals	☑			☑
Acute Toxicity	☑	✓	✓	✓
<i>E. coli</i>		✓	☑	✓
Benthic Macroinvertebrates	☑			
Physical Habitat	☑			

✓ – indicator      ☑ – most limiting indicator

## Program Benefits

- Maintains long-term trend monitoring in the Sacramento Watershed
- Provide data of known quality for use by multiple programs
- Expands spatial and temporal water quality assessments within the Central Valley through the addition of sites and parameters
- Provides a framework for multiple program coordination

## Program Challenges

- Logistics:** Coordinating six field crews, distributing supplies, and delivering samples to five different laboratories
- Quality Assurance:** Ongoing training, continual review of the data, and internal audits for participating staff
- Data Management:** Data is currently being stored in separate databases by DWR and SWAMP, so data must be pulled from both sources to compile a complete project dataset. As a short term solution, data will be posted on the Central Valley Water Board webpage starting in the fall of 2010. A longer term solution for a statewide data center is being pursued by SWAMP.

## Monitoring Objectives

This monitoring effort was designed to address long term water quality issues and 303(d) reporting needs of the Sacramento Watershed. The effort will provide critical water quality data needed to identify changes in stream and river conditions over time in relation to ongoing management activities. The overall monitoring objectives are:

- What are the ambient water quality conditions and are current management activities protecting beneficial uses?
- What does the evaluation of trends with respect to water quality and the biological communities tell us about the state of the watershed?