Overview of the Surface Water Ambient Monitoring Program (SWAMP)

North Coast Regional Water Board
Item 4
October 20, 2016

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California Water Boards

SWAMP
Surface Water Ambient Monitoring Program

PRESENTATION OUTLINE

I. SWAMP's History & Mission

II. Current Statewide Core Program Elements

III. Current Regional Monitoring Projects

IV. Future Regional Monitoring Projects

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HISTORY OF SWAMP

- AB 982 (Statutes of 1999) – Legislature directed the State Board to propose comprehensive monitoring program
- 2000 Report – “Proposal for a Comprehensive Ambient Surface Water Quality Monitoring Program”
  - Biological, chemical and habitat indicators
  - Quality Assurance/Quality Control protocols
  - Readily available data
- Resources – State and Federal funds; Staff at State and Regional Water Boards

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SWAMP MISSION

To provide resource managers, decision makers, and the public with timely, high quality information and tools to evaluate the condition of surface waters throughout California.

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CORE PROGRAM ELEMENTS

1. Ambient Monitoring Programs
2. Information Management
3. Coordination

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1. Ambient Monitoring Programs

Statewide Programs

- Bioassessment Monitoring Program
- Stream Pollution Trends Monitoring Program
- Bioaccumulation Monitoring Program
- Freshwater Harmful Algal Blooms

Regional Programs

- Question-driven monitoring at the Regional scale

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SWAMP ASSESSMENT QUESTIONS

- **Status:** What is the overall quality of California's surface waters?
- **Trends:** What is the pace and direction of change in surface water quality over time?
- **Problem Identification:** Which water bodies have water quality problems and which areas are at risk?
- **Diagnostic:** What are the causes of water quality problems and where are the sources of those stressors?
- **Evaluation:** How effective are clean water projects and programs?

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Bioassessment Monitoring Program

- What is the **biological** condition of California's perennial "wadeable" (smaller) streams?
- Do different types of land use have an effect on biological condition?
- Perennial Streams Assessment (PSA)
- Reference Condition Monitoring Program (RCMP)





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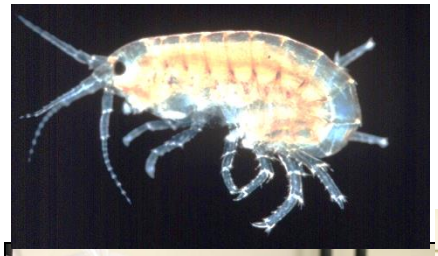
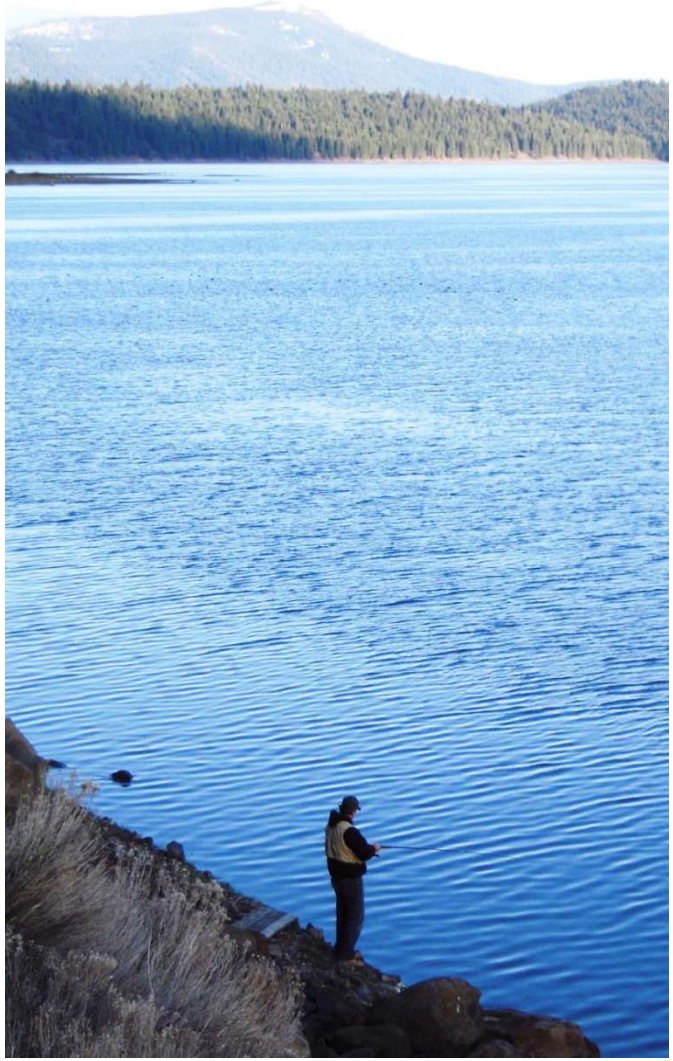
Stream Pollution Trends Monitoring Program (SPoT)

- What is the status of stream contamination and is it getting better or worse?
- What effect do land use and management actions have on stream contamination?



Bioaccumulation Monitoring Program

- Bioaccumulation Oversight Group (BOG)
- Are the fish safe to eat? (“Fishable”)
- What is the status of contamination in sport fish from lakes, coastal waters, and large rivers?



Freshwater Harmful Algal Blooms (HABs)

- Incident response coordination
- Training and outreach
- Remote sensing analysis of satellite images
- Freshwater HABs Monitoring and Assessment Strategy
- Standard Operating Procedures (SOPs) for sampling and analysis

In coordination with the California CyanoHAB Network (CCHAB)
http://www.mywaterquality.ca.gov/habs/index.html

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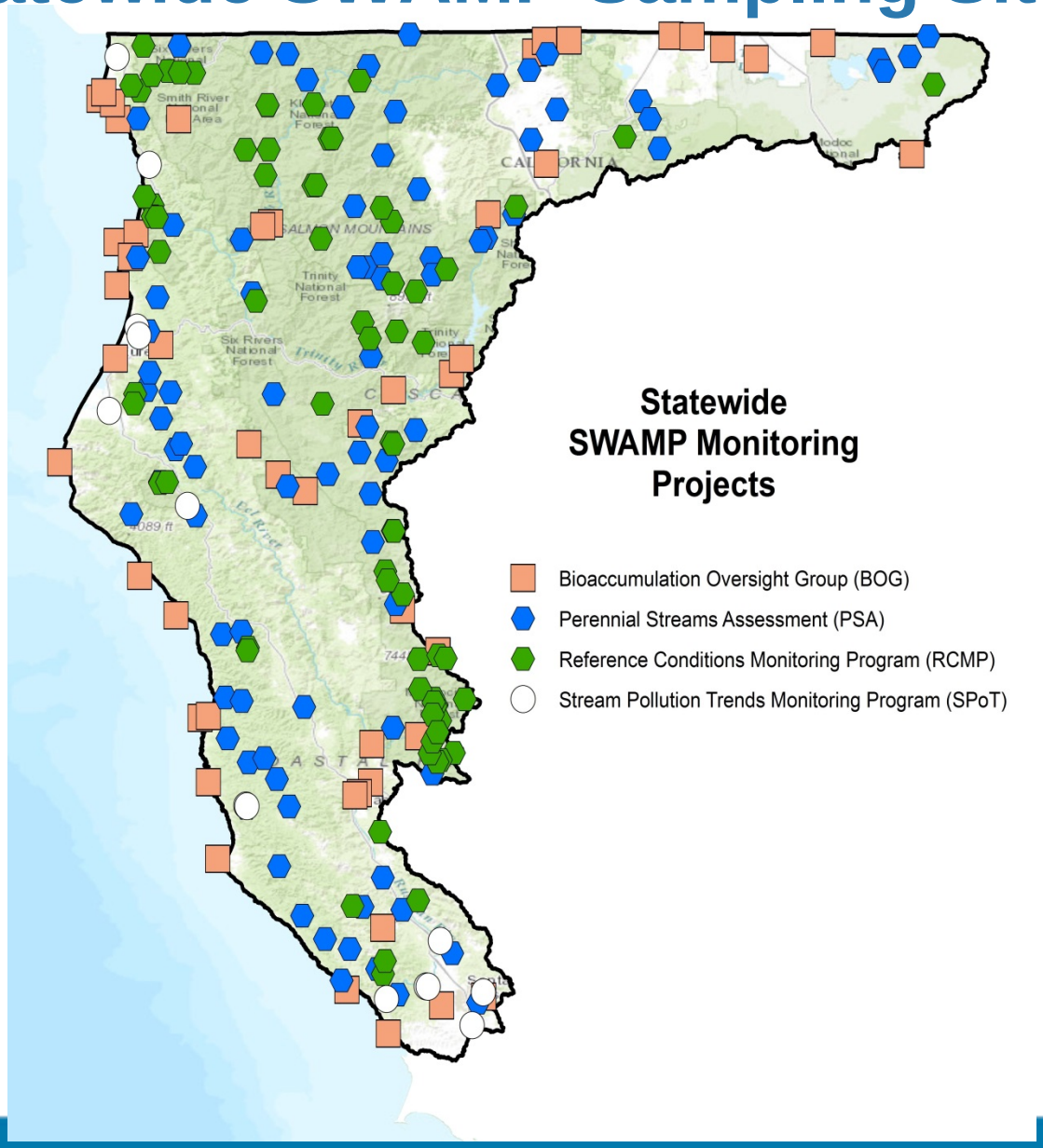
Statewide SWAMP Sampling Sites



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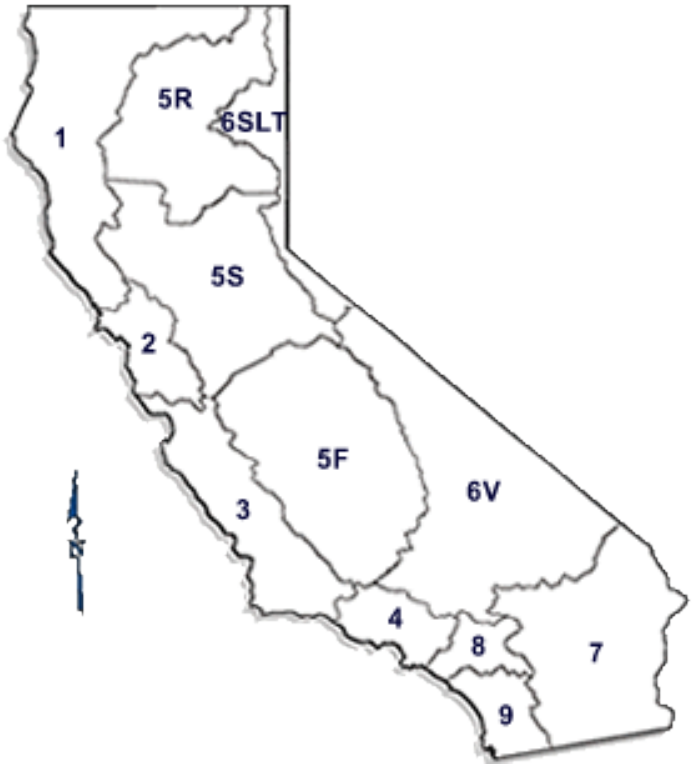
Regional SWAMP Monitoring Programs

Each of the nine Regional Water Boards manages their own SWAMP monitoring program to support Regional priorities.



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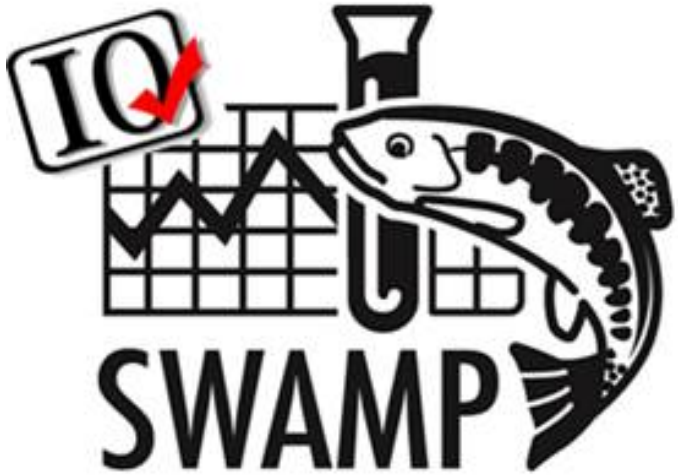
2. Information Management

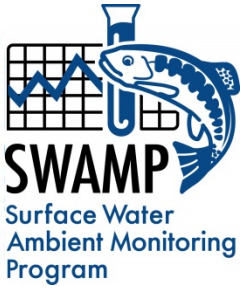
The SWAMP Information Management and Quality Assurance Center (SWAMP IQ) at the State Water Board supports SWAMP's endeavor to ensure scientifically defensible, comparable and useful data statewide.

- Quality Assurance
- Information/Data Management
- Documentation, Resources, Tools
- Education & Training



3. Coordination

SWAMP leverages limited resources by creating **partnerships** and **coordinating** with other water quality monitoring efforts on a local, regional and statewide level.



SWAMP WEBSITE: http://www.waterboards.ca.gov/water_issues/programs/swamp/

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CURRENT
REGIONAL MONITORING PROJECTS

1. Fish Consumption Advisory Monitoring
2. Contaminants of Emerging Concern Identification
3. Smith River Plain Water Quality Assessment
4. Cyanobacteria and Harmful Algal Blooms Monitoring
5. Garcia River Sediment Assessment
6. Reporting on:
   - Regional Status and Trends Assessments
   - Russian and Eel Rivers Nutrient Assessments

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Fish Consumption Advisory Monitoring

Purpose:

- To analyze pollutants in sport fish tissue to determine if fish consumption advisory notices are necessary

Sample Analytes:

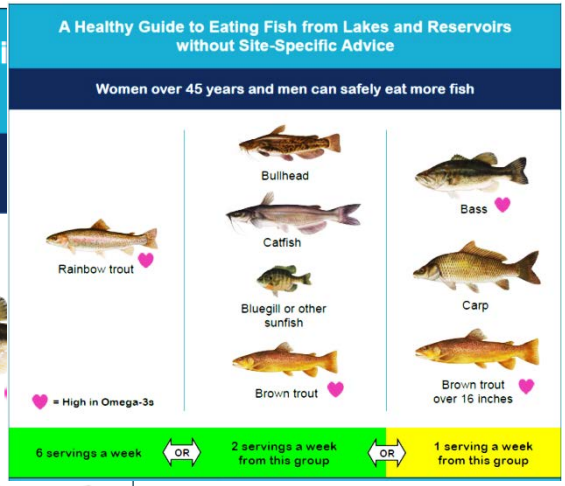
- Mercury
- PCBs
- DDTs
- Pesticides

Sample Locations:

- Russian River (4 sites)
- Laguna de Santa Rosa at Occidental Road
- Spring Lake

Status:

- Sampling was completed in Summer 2016
- Data will be submitted to OEHHA for their consideration and development of fish consumption advisories



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Contaminants of Emerging Concern (CECs)

Purpose:

- To determine if priority CECs are present in the Russian River
- To compare concentrations to thresholds and aquatic life response

Sample Analytes:

- Industrial and commercial chemicals
- Pharmaceutical and personal care products
- Emerging pesticides
- Hormones

Sample Locations:

- Russian River (8 sites)
- Effluent from Ukiah & Cloverdale wastewater treatment facilities

Status:

- Samples were collected in 2015 and 2016
- Final sampling event is planned for Winter 2016-2017
- Report is planned for Spring 2017 from San Francisco Estuary Institute and Southern California Coastal Water Research Project

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Smith River Plain Water Quality Assessment

Purpose:

- To determine if chemicals are present in surface water, streambed sediments, or shallow groundwater in agriculture-dominated areas

Status:

- Sampling was conducted in 2013 and 2015
- Interim reports are complete
- Final report planned for early 2017

Interim Reports Available at:

- http://www.waterboards.ca.gov/northcoast/water_issues/programs/agricultural_lands/

Smith River Plain Water Quality Assessment Surface Water & Streambed Sediment

Sample Analytes:

- Field water quality parameters
- Metals
- Nutrients
- Toxicity
- Pesticides

Sample Locations:

- Tributary streams/sloughs to the Smith River (5 sites)

Interim Results:

- 10 of 183 pesticides were detected at concentrations below thresholds for the protection of aquatic life
- Reduced reproduction of aquatic life in 3 of 12 samples
- Reduced survival of aquatic life in 1 of 12 samples
- Copper exceeded the threshold for toxicity to aquatic life in 3 of 12 samples
- Nitrogen exceeded the threshold for biostimulatory conditions in 3 of 5 sites

Smith River Plain Water Quality Assessment Groundwater

Sample Analytes:

- Copper
- Nitrate
- Pesticides

Sample Locations:

- Irrigation & domestic groundwater wells (7 sites)

Interim Results:

- 1 of 320 pesticides was detected below drinking water thresholds
- Copper was detected below drinking water thresholds in 1 of 7 wells
- Nitrate exceeded drinking water thresholds in 3 of 7 wells, which are used for irrigation and not drinking water

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Cyanobacteria & Harmful Algal Bloom Monitoring

Purpose:

- To determine the extent and timing of toxin development
- To better understand connection between toxin and cyanobacteria or algae species

Sample Analytes:

- Microcystin
- Anatoxin
- Taxonomic identification of cyanobacteria and algae species

Sample Locations:

- Russian River (5 sites)
- Eel River (2 sites)
- South Fork Eel River (2 sites)
- Other sites in response to blooms

Status:

- Sampling just ended for the Summer 2016 season
- Report planned for Spring 2017 to inform Summer 2017 efforts
- We will continue monitoring through 2020

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Garcia River Watershed Sediment Monitoring

Purpose:

- To evaluate the effectiveness of conservation and restoration practices
- To assess progress toward attainment of TMDL and non-point source program performance measure

Sample Analytes:

- Field water quality parameters
- Physical habitat
- Macroinvertebrate populations
- Nutrients
- Algal species composition and biomass

Sample Locations:

- 65 reaches every 5 years
- 6-9 reaches per year

Status:

- We will continue monitoring through 2020

Reports In Progress

Regional Status & Trends Report

- Purpose:
  - To understand general water quality conditions, metals, and pesticides in the region's major rivers
- Status:
  - 2001-2006 data report is available
  - 2002-2013 data report is planned for Spring 2017

Russian & South Fork Eel Rivers Nutrient Report

- Purpose:
  - To understand nutrient enrichment and algal growth
- Status:
  - 2010-2011 data report is planned for Spring 2017

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FUTURE 2017-2020
REGIONAL MONITORING PROJECTS

1. Cyanobacteria & Harmful Algal Bloom Monitoring
2. Garcia River Watershed Sediment Monitoring
3. Elk River Sediment Monitoring
4. Shasta River Temperature & Nutrient Monitoring
5. Stream Temperature Monitoring
6. Stream Flow Monitoring
7. National Forest Bacteria Speciation
8. Watershed-Focused Conditions Monitoring

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Elk River Sediment Monitoring

Purpose:

- To evaluate the sediment budget

Sample Analytes:

- Turbidity
- Suspended sediment concentration
- Physical habitat
- Stream flow

Sample Locations:

- Lower mainstem Elk River

The monitoring plan will be developed in partnership with the Stewardship Group.

Shasta River Temperature & Nutrient Monitoring

Purpose:

- To assess trends in water quality conditions
- To evaluate the effectiveness of watershed-wide stewardship efforts
- To assess attainment of TMDLs and a Non-point Source Program performance measure

Sample Analytes:

- Water temperature
- Air temperature
- pH
- Nutrients
- Dissolved Oxygen

Sample Locations:

- Shasta River (9 sites)
- Tributary creeks (6 sites)

Stream Temperature Monitoring

Purpose:

- To assess temperature conditions
- To better understand changes in climate in reference reaches
- To evaluate the effectiveness of riparian restoration projects and stream flow augmentation projects
- To build partnerships

Sample Analytes:

- Water temperature – time series data collected in 15-30 min. intervals

Sample Locations:

- 75 sites per year region-wide – through the distribution of temperature loggers on loan to partners
- 15 sites per year region-wide – through staff-led logger deployment

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Stream Flow Monitoring

Purpose:

- To develop flow records during the dry season of April to October
- To help understand flow trends, identify draw-down events, and inform flow criteria
- To share information with local partners

Sample Analytes:

- Stream flow (e.g., cubic feet per second)

Sample Locations:

- 15 sites per year
- Locations TBD by internal Flow Team

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National Forest Bacteria Speciation

Purpose:

- To evaluate the presence of bovine fecal waste in streams that drain representative grazing allotments
- To supplement required pathogen indicator bacteria (e.g., *E. coli*) monitoring by the U.S. Forest Service

Sample Analytes:

- Bovine *Bacteroides* bacteria

Sample Locations:

- 15 sites total per year
- 3 sites per grazing allotment;
  1 grazing allotment per each of the
  5 National Forests

Photo Credit: UC Davis Rangeland Watershed Laboratory

Watershed-Focused Conditions Monitoring

Purpose:

- To evaluate a high priority watershed as needed

Possible Sample Analytes:

- Chemicals
- Biology
- Physical habitat

Sample Locations:

- TBD

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

http://www.mywaterquality.ca.gov/index.html

Welcome to My Water Quality

Is Our Water Safe to Drink?

Safe drinking water depends on a variety of chemical and biological factors regulated by a number of local, state, and federal agencies. *[Future Portal]*

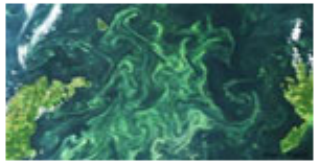
Is it Safe to Swim in Our Waters? Swimming safety

of our waters is linked to the levels of pathogens that have the potential to cause disease. Learn more >>

Are Our Aquatic Ecosystems Healthy?

The health of fish and other aquatic organisms and communities depends on the chemical, physical, and biological quality of the waters in which they live. Learn more >>

Are Harmful Algal Booms Affecting Our Waters?



Harmful algal blooms can make water unsafe for swimming and other recreational activities. The toxins they produce can harm pets, livestock, and people. Learn more >>

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