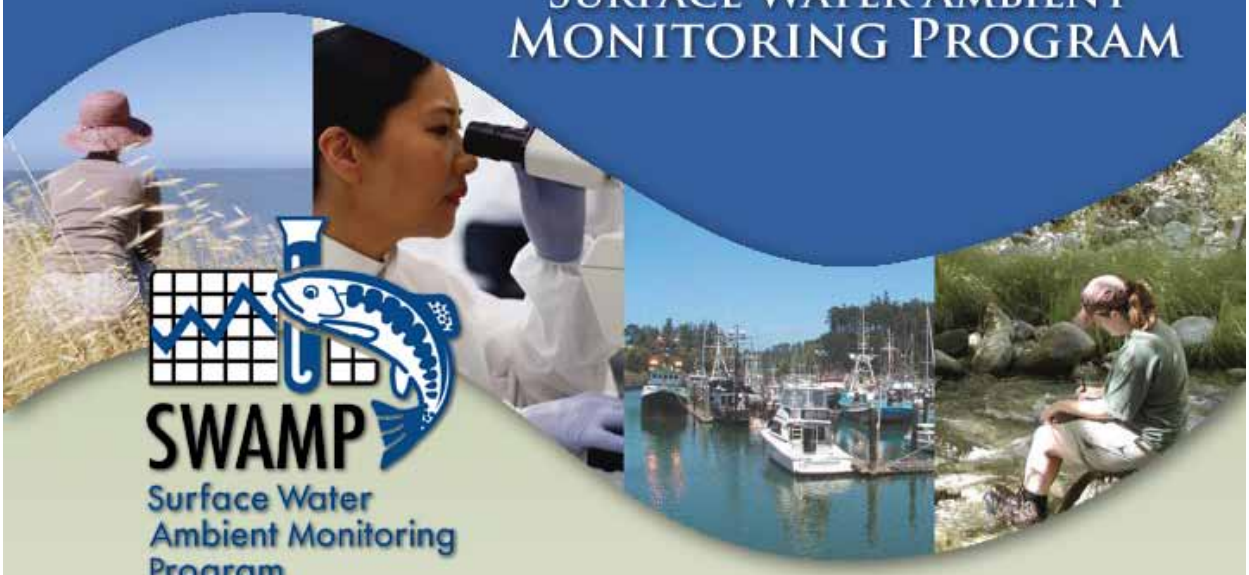
Surface Water Ambient Monitoring Program



SWAMP
Surface Water Ambient Monitoring Program

SWAMP 2009 Achievements

California Water Boards

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

Forward

Welcome to the 2009 Surface Ambient Monitoring Program's Achievements Report.

As we enter the 10th year of SWAMP, it seems appropriate to recognize our achievements for the past year. I know that sounds like a rather simple task, but with a program such as SWAMP where much of what we undertake is long term or refined as technology allows us to improve our efforts, it is not so straightforward. This task is complicated further by wanting to focus on what we had accomplished for this past calendar year. This took a little time - not because there was little to report, but rather, because SWAMP has accomplished so much.

While the goal of this document is to highlight SWAMP and its 2009 accomplishments, we appreciate that most were achieved with partners and collaborators and we cannot say enough about these individuals and groups – from the organizations that use our data to the collaborators who follow our guidelines for comparability to the program scientists that seem to always go the extra mile to those organizations who, like us, are looking to stretch infinitely thin resources for monitoring and assessment. Thank you and keep up the good work!

SWAMP is about water quality; it's about collecting data and determining how good our water resources are; it's about communicating what we know to the public so we know where we need to focus to make the water resources clean and usable for this and future generations.

SWAMP started in 2000 with grand aspirations and few resources. Today, we add several years of sweat from laying a firm foundation and the wisdom that comes with that hard work. Currently, SWAMP has three statewide monitoring programs – monitoring of pollutants in sport fish, bioassessment of wadeable streams and the development of reference conditions, and pollutant assessment at integrator sites in streams. We have several assessment efforts underway that will be communicated through different media including print, the Internet, and Internet portals. We also have significant collaborative monitoring and assessment activities occurring in the regions. And again, we are fortunate to have many collaborators and partners working with us shaping SWAMP into the program it is today.

Please take a minute to read and learn about SWAMP and its 2009 achievements. See for yourself the numerous and varied activities that transpired. Know that while we have taken a moment to reflect on the past year's accomplishments, work, including the revision of our Strategic Plan, continues.

Valerie Connor, Ph.D.

Director, Office of Information Management and Analysis

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Introduction

Surface Water Ambient Monitoring Program (AB982)

What is SWAMP?

The Surface Water Ambient Monitoring Program (SWAMP) at the State Water Resources Control Board is to provide the information about surface water quality that our society needs to make informed decisions about how to manage, restore, and allocate water resources. SWAMP was created to fulfill the State Legislature's mandate (AB982) for a comprehensive and unifying program that would coordinate all surface water quality monitoring conducted by the State and Regional Water Boards. SWAMP has produced conventions for monitoring design, measurement indicators, data management, quality assurance, and assessment strategies, so that data from many programs can be combined and used in integrated assessments that answer critical management questions. Statewide and regional monitoring programs that receive funding from SWAMP are each designed to evaluate one or more of the following 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 are at risk?
- Diagnostic: What are the causes of water quality problems and where are the sources?
- Evaluation: How effective are clean water projects and programs?

An important step for SWAMP in implementing the State Legislature's mandate has been to forge partnerships with outside agencies and organizations. The collaboration that results allows SWAMP and its partners to leverage their limited funds for monitoring, promote communication between groups, and lay the foundation for further cooperative projects.

Why is SWAMP important to the State?

SWAMP's mission is to provide resource managers, other decision makers, and the public with timely, cost effective, high-quality information to evaluate the condition of all surface waters throughout the State. To accomplish this mission, SWAMP proceeds primarily along two pathways: 1) SWAMP conducts limited monitoring on statewide and regional scales and relies on partnerships and collaboration to stretch the limited monitoring resources, and 2) SWAMP has created a common

framework that coordinates monitoring efforts by offering a uniform approach and important tools. Tools include a Quality Assurance (QA) program that ensures that the data collected are of known and documented quality; a standardized data storage system that meets the growing need for data standardization and integration; a set of standard operating procedures for sampling that promote comparability among projects conducted by different groups; and peer review of monitoring plans for each project that ensures scientific rigor. Additionally, SWAMP continues to create a water quality indicator list to further enhance the tools available to assess water quality. All of these elements assist SWAMP in fulfilling its stated mission and the State having meaningful data to fulfill federal regulatory mandates in a cost effective manner.

Why is SWAMP important to me?

Water is precious to all Californians. Its value is directly related to its quality. Every year, hundreds of decisions are made that influence water quality. These decisions range from local development decisions to statewide policy implementation. Without monitoring data, we would not know the affect of these decisions on water quality until it was visually obvious – which is usually too late. SWAMP provides data that can inform state and local officials about the current condition of a water body as well as how quickly the condition of a water body is changing.

How will this information be used?

The State is required to report on the status of the waters of California and to identify and report on impaired water bodies. Data collected by SWAMP and its many collaborators and partners provides information that can be used to help answer the above questions as well as used for making management decisions such as recognizing that a water body is not meeting water quality objectives and requiring that actions be taken to make the water cleaner. Additionally, this information is used by other agencies. For example, the Office of Environmental Health Hazard Assessment uses SWAMP data along with monitoring data from other agencies to develop fish consumption advisories and safe eating guidelines.

Comparability –

Guidance, Quality Assurance, & Data Management

What is it?

The U.S. Environmental Protection Agency (EPA) defines comparability as "the measure of confidence with which one data set, element, or method can be considered as similar to another". Comparability is an especially important consideration with SWAMP data, which represents a wide variety of objectives, organizations and procedures over many years, both governmental and non-governmental. SWAMP has developed guidelines and tools for projects funded by SWAMP, and for groups who are interested in being SWAMP-comparable. These include the SWAMP Data Management Plan, the SWAMP Quality Assurance Program Plan, the SWAMP Help Desk, and the new SWAMP Comparability Fact Sheet.

To get the most out of its limited resources, SWAMP focused its initial program efforts on developing program guidance (namely procedures, tools, and guidelines) that monitoring groups can use to ensure their monitoring project design produces data that are SWAMP comparable. Examples of SWAMP guidance include the Comparability Fact Sheet, the SWAMP Quality Assurance Program Plan, the QAPP Advisor Tool, the Algae Standard Operating Procedures, and the Bioassessment Quality Assurance Program Plan. Examples of data management comparability and coordination include online data sheets, templates, and documentation for data submission, online Data Checker, and a much enhanced Data Management and Quality Assurance Team Website. The SWAMP Help Desk provides live information and answers questions on SWAMP comparability.

Why is it important to the State?

In the past, money was invested in projects that generated valuable data and resulted in a tremendous increase in knowledge about ambient water quality. However, these projects lacked coordination and consistency, thereby making it difficult to systematically summarize across projects. A first step in addressing this oversight has been to establish basic guidance and monitoring data quality objectives to establish a common framework.

Why is it important to me?

The high quality data that SWAMP and its partners collect and manage provides information that can

be used to help answer the questions:

- How well are we managing California's precious resource – water?
- Are we protecting the beneficial uses of our water – namely, is the water safe for me to swim in, is the fish caught in it healthy so that I may eat it, is the overall ecosystem healthy?
- Are we investing our limited state resources effectively and focusing them on the right water quality problems.

Additionally, better coordination between projects and agreement on basic approaches such as data and measurement quality objectives means funds will be spent effectively and efficiently.

How will these tools be used?

These "tools" will be used by other state, federal, and local agencies as well as monitoring groups who conduct ambient water quality monitoring in California. The use of these tools ensures comparability of data. They also ensure that the data collected will be of high quality.

A list of SWAMP-sponsored Comparability Projects in 2009:

- Provided service on comparability through the SWAMP Help Desk
- Launched v2.5 SWAMP database
- Updated data sheets, templates, and documentation for v2.5 data submissions
- Launched SWAMP Data Management/Quality Assurance Team Website
- Updated Online Data Checker to include 'tissue data types'
- Published SWAMP Comparability Fact Sheet
- Updated SWAMP Quality Assurance Program Plan (QAPP) Advisor Tool
- Released document detailing specific procedures for assessing algae communities in streams
- Published quality assurance plan for bioassessment in Southern California watersheds
- Released document detailing specific procedures for assessing algae communities in streams
- Published monitoring and quality assurance plans for studying contaminants in sport fish on the California Coast
- Released document detailing specific procedures for assessing algae communities in streams
- Published QAPP for Sacramento Watershed Coordinated Monitoring Program

Monitoring

What is it?

Monitoring is the collection of scientific data at specified intervals from a network of sites in order to answer assessment questions such as:

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

SWAMP monitoring activities include the design of monitoring programs, including survey schedules, site networks, measurement indicators, and statistical methods to best characterize resource condition; field observation and field sample collection; laboratory analyses of field samples; and retrieval and organization of relevant ancillary data (flow, land use, etc.) available from other sources. The resulting data are then evaluated or assessed to provide information for resource management. Prior to the start of a monitoring project, a Monitoring Plan and Quality Assurance Project Plan must be developed and approved. These documents also receive external peer review by known experts. The statewide and regional monitoring projects are collaborative efforts receiving financial support from SWAMP as well as one or more of our valued partners. Many of the monitoring efforts span multiple years.

Why is SWAMP monitoring data important to the State?

SWAMP monitoring programs address information needs at both the statewide and regional levels. SWAMP encourages data sharing, consolidation, and comparability by providing disparate projects and partner agencies with program-compatible database formats, management guidelines, and quality systems. Data collected by and for SWAMP are then used to conduct regional and statewide assessments. Statewide monitoring and assessments provide information on the status and trends

of California waters to guide decisions made by the Legislature and the State Environmental and Resource agencies. Regional monitoring and assessments provide rapid feedback for problem management, information to determine the causes and sources of impairments, identification of emerging threats, evaluation of management effectiveness, and ability to partner with local agencies.

Why is SWAMP monitoring important to me?

Clean and healthy streams and rivers support aquatic life by providing habitat, spawning grounds, food and shelter for fish, birds, and other wildlife. Impairment of water quality reduces the ability of a waterbody to provide these functions, functions that we enjoy. Monitoring provides valuable information on the health of our streams – both on a statewide and local level.

How will this information be used?

Data collected for and by SWAMP provides information that can be used to help answer the above questions. It can also be used for making management decisions such as recognizing that a water body is not meeting water quality objectives and requiring that actions be taken to make the water cleaner. SWAMP data are used by local agencies for developing permits and by State agencies in the development of fish consumption advisories and safe eating guidelines.

A list of SWAMP-sponsored Monitoring Projects in 2009 is provided below:

- Initiated study to assess contaminants in sport fish along California's coast
- Initiated a statewide study to assess stream contamination by assessing toxicity at integrator sites
- Continued statewide study to assess condition of perennial streams using bioassessment
- Supported National Oceanic and Atmospheric Administration with mussel sampling for known and emerging contaminants
- Supported the Klamath Basin Monitoring Program

- Supported trend monitoring and ongoing bioassessment work in implementation of the Garcia River TMDL
- Initiated formation of an integrated and coordinated watershed monitoring program in Alameda, Contra Costa, San Mateo, and Santa Clara Counties and the cities of Fairfield, Suisun City, and Vallejo
- Completed the second of two 5-year watershed monitoring rotations in the Central Coast Region
- Initiated collaborative perennial streams monitoring program for Southern California
- Initiated Sacramento Watershed Coordinated Monitoring Program
- Initiated screening study to determine where bacteria are coming from in some Central Valley streams
- Continued collaboration in the Los Angeles River Watershed Comprehensive Monitoring Program

Assessment

What is it?

In order to provide information necessary for resource management decisions, data need to be collected through carefully designed monitoring, and those data need to be translated into policy-relevant information through data assessment. Assessment may take the form of comparing measured chemical concentrations against standards set to protect the beneficial uses of waterways. Assessment may include statistical analyses to evaluate average conditions across the landscape at a point in time, or to describe trends in condition over time. Assessments can incorporate other types of data, such as land use or management activity information, to determine causes of environmental impacts. To be of greatest value for decision making, monitoring must be designed to address clearly articulated assessment questions, and the resulting data must be of known quality and easily accessible.

Why is it important to the State?

Adequate and accurate monitoring and assessment are the cornerstones to preserving, enhancing and restoring water quality. Without evaluation or assessment, data are simply numbers from a laboratory test or field inventory. Water quality assessments turn monitoring data into policy-relevant information to protect and enhance the State's water resources. Assessments are used in the preparation of the Clean Water Act Section 305(b) reports and 303(d) listings

Why is it important to me?

Assessments help us to know many things about our State's water including: how healthy our rivers and streams are and how quickly the health of our water bodies is changing and whether they

are getting better or worse. They can also inform us on whether the fish caught at a fishing hole is safe to eat and what has caused water quality problems at a particular waterbody.

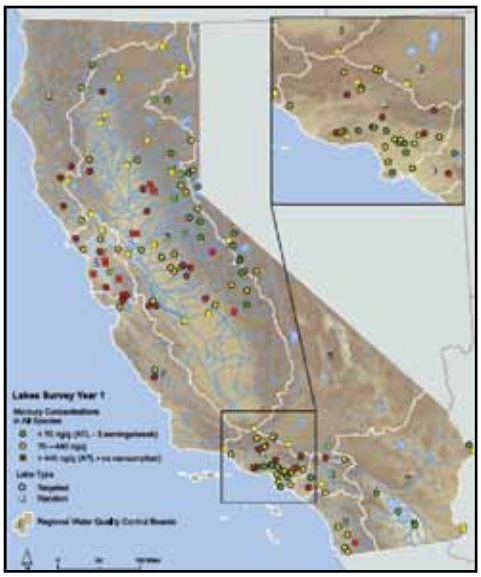
How will they be used?

SWAMP assessments are contained in interpretive reports, web-based information products, fact sheets, Clean Water Act (CWA)§303(d) impaired water body listings, and the bi-annual CWA §305(b) report on the status of water quality in California. SWAMP assessment efforts are geared toward:

- providing context for specific water resource issues;
- developing and evaluating water quality indicators, such as chemical measurements, ecological metrics, toxicity endpoints, and field observations, that adequately and repeatedly characterize environmental conditions;
- setting assessment thresholds, which are values against which to compare measurement data to determine whether water quality is sufficient to support its designated beneficial uses;
- developing assessment tools, which are procedures used to statistically or otherwise compare measurements with thresholds and evaluate resource health;
- establishing a statewide assessment framework that describes the types of data needed from all partners to adequately answer the State's priority assessment questions.

A list of SWAMP-sponsored Assessments in 2009 is given below:

- Published US EPA's review of the State's Bioassessment Program
- Published plan for developing and maintaining reference conditions for interpreting bioassessment data in California's wadeable streams
- Published report on contaminants in sportfish from California lakes and reservoirs; Additional publications for this project include:
  - California Lakes: New Monitoring Program Reveals Widespread Contamination of Fish in California Lakes. (Fact Sheet: Lakes)



- California Lakes: New Monitoring Program Reveals Widespread Contamination of Fish in California Lakes. (Press Release: Lakes)
- California Lakes: New Monitoring Program Reveals Widespread Contamination of Fish in California Lakes. (Frequently Asked Questions: Lakes)

- Published "Safe to Swim" Fact Sheets
- Published "San Joaquin River Basin: Main Stem and Drainage Basin Sites"
- Published "San Joaquin River Basin Rotational Sub-basin Monitoring: Cosumnes, Mokelumne, and Calaveras Watershed"
- Published "Residential Runoff as a Source of Pyrethroid Pesticides to Urban Creeks"
- Published "Index of Biological Integrity (IBI) for the Eastern Sierra Nevada Ecoregion"
- Published "Wadeable Streams Bioassessment Sites Sampled "
- Completed Eutrophication Assessment in San Diego Coastal Wetlands
- Began work on San Diego Regional Water Quality Data Portal

Communication & Outreach

What is it?

An important part of scientific inquiry is the communicating of results. Communicating is the sharing of ideas and experimental findings with others through writing and speaking. SWAMP monitoring produces data that program scientists evaluate, analyze, and present as information to answer assessment questions.

Why is it important to the State?

SWAMP strives to create and deliver communication products in ways that most effectively provide the information needed by decision makers to manage California's water resources. SWAMP also works to communicate scientific findings to the general public.

Why is it important to me?

All SWAMP programs produce data that program scientists evaluate, analyze, and present as information to answer assessment questions. SWAMP communicates this information in a number of consistent formats designed to effectively reach target audiences. SWAMP produces a newsletter (The Monitor), fact sheets on specific issues, meeting presentations for agencies, partners, and the public, and interpretive reports, including the CWA required State 305(b)/303(d) Integrated Report.

How will it be used?

SWAMP communicates this information in a number of consistent formats designed to effectively reach target audiences. Types of SWAMP information products include:

- an annual summary report that describes current SWAMP activities and highlights key findings;
- an annual meeting to disseminate SWAMP information and receive feedback from partner monitoring organizations and stakeholders;
- interpretive reports providing assessments from key SWAMP programs on important water quality issues;

- State of the State reports on key issues and to fulfill the State's reporting obligations under section §305b of the Clean Water Act;
- a quarterly newsletter, The Monitor, to promote opportunities for coordination and to alert readers to availability of larger SWAMP information products;
- fact sheets with abbreviated highlights of SWAMP assessments;
- electronic email updates to alert partners and stakeholders to the availability of recent documents;
- data submitted to the SWAMP database;
- data products from the SWAMP database to be used both by external scientists and by agency staff responsible for impaired waterbody (§303d) listings, TMDL programs, stormwater monitoring, waste receiving water monitoring, and other water quality protection programs.

SWAMP publications in 2009

- Evaluation of the California State Water Resources Control Board's Bioassessment Program
- Recommendations for the Development and Maintenance of a Reference Condition Management Program to Support Biological Assessment of California's Wadeable Streams
- Contaminants in Fish from California Lakes and Reservoirs: Technical Report on Year One of a Two-Year Screening Survey (a fact sheet, frequently asked questions, and press release for this project)
- San Joaquin River Basin: Main Stem and Drainage Basin Sites
- Wadeable Streams Bioassessment Region 8 Sites Sampled May –June 2006
- Wadeable Streams Bioassessment Region 8 Sites Sampled May –June 2007

A list of SWAMP communication activities in 2009 is provided below:

- Improved the SWAMP website
- Re-launched quarterly Monitor Newsletter
- Initiated SWAMP webinars series; Eight webinars were produced in 2009:
  - SWAMP Comparable Program Guidance
  - Quality Assurance/Control Comparability
  - Comparability – Data Management Overview
  - SWAMP and MLML Website Navigation
  - A New Tool for Water Quality Assessment – Algae as Bioindicators
  - Contaminants in Fish from California Lakes and Reservoirs
  - "My Water Quality" Internet Portals
  - Invasive Species Management for Water Quality Monitors
- Featured in national news coverage for NOAA Pilot Mussel Watch Program
- Featured in national news coverage for National Lakes Study

Coordination - Partners

SWAMP works with partners to coordinate monitoring efforts among many groups and agencies, and to facilitate the use of data from many sources in statewide and regional assessments.

The list of SWAMP Partners in 2009 included:

- California Department of Fish and Game, Aquatic Bioassessment Laboratory
- California Department of Fish and Game
- California Department of Water Resources, Northern District
- California Environmental Protection Agency
- California Office of Health Hazard Assessment
- California Water Quality Monitoring Council
- Grasslands Bypass Project
- Klamath Basin Water Quality Monitoring Coordination Group
- Los Angeles River Comprehensive Monitoring Program
- Moss Landing Marine Laboratories, Marine Pollution Studies Laboratory
- Natural Resource Projects Inventory
- National Oceanic and Atmospheric Administration
- San Francisco Estuary Institute
- San Francisco Estuary Regional Monitoring Program
- San Gabriel River Regional Monitoring Program
- Southern California Bight Regional Monitoring Program
- Southern California Coastal Water Research Project
- Stormwater Monitoring Coalition
- U.C. Davis Aquatic Ecosystems Analysis Laboratory
- U.C. Davis, Granite Canyon Laboratory
- U.S. Environmental Protection Agency

COORDINATION – State and Regional Water Board Program Partners

- Ag Waivers/Irrigated Lands Regulatory Program
- Bay-Delta Team
- 401 Certification and Wetlands Program
- Clean Water Team
- Grants Projects
- Nonpoint Source Program
- NPDES Permitting Program
- Ocean Standards Unit
- Stormwater Program
- Total Maximum Daily Loads Program

Management Decisions

Data is routinely used by the State Water Resources Control Board and the nine Regional Water Quality Control Boards to inform assessment reports, to make enforcement decisions, to develop permits and programs, and to make Clean Water Act 303(d)listing and 305(b) reporting decisions.

Examples of specific management decisions made in 2009 include:

- The 2010 Integrated Report for the federal Clean Water Act Sections 303(d) and 305(b) contained a total of 22,251 lines of evidence for the listing and delisting of waterbodies - 11,743 lines of evidence were contributed from SWAMP data.
- The placement of 26 waterbodies on the Clean Water Act Section 303(d) list for trash in the San Francisco Bay Region was possible by using a trash assessment method developed by SWAMP; additionally, new trash requirements were incorporated into the recently adopted municipal regional stormwater permit.
- The adoption of a municipal separate storm sewer systems (MS4s) regional permit was adopted that required all applicable monitoring to be SWAMP comparable for Alameda, Contra Costa, San Mateo, and Santa Clara Counties and the cities of Fairfield, Suisun City, and Vallejo.
- The San Diego Regional Water Board adopted the first numeric action levels for a stormwater permit in California. The scientific basis of the numeric action levels was partially based on data collected under the SWAMP.
- The revision and/or development of 18 fish consumption advisories and safe eating guidelines by the Office of Health Hazard Assessment were made possible by new information that included data from SWAMP.
- The Central Coast Regional Water Board used SWAMP data and the State Nutrient Numeric Endpoint technical approach to develop a numeric criterion for nitrate for use in assessing water bodies for aquatic life impairment.
- The Central Coast Regional Water Board developed software to comprehensively screen data for the 2010 303(d) List, and evaluated all data sources for all applicable beneficial uses.
- The Central Coast Regional Water Board consolidated SWAMP and agricultural regulatory program data and conducted a comprehensive analysis for support of the new Order for Irrigated Agriculture. The assessment includes an updated website with map and chart displays of site status and change.

2010 Commitments

Many of the programs and projects that had accomplishments in 2009 are multiple year efforts that will continue to have work products throughout the length of the study. Anticipated accomplishments for SWAMP directed and collaborative projects in 2010 include:

COMPARIBILITY - Guidance, Quality Assurance, and Data Management

- Enhance existing documentation for Data Management Plan
- Create documentation for Bioassessment Data Submission templates
- Add bioassessment data checks to Online Data Checker

Monitoring and Assessments

- Continue to sponsor statewide programs and regional projects
- Finalize Bioassessment Report
- Publish Bioaccumulation Monitoring Program Coastal Study Technical Report – First year data
- Publish Stream Pollutant Trend Monitoring at Integrator Sites Technical Report – First year data
- Publish Lake and Reservoir Study using 2 years of data – Final technical report, Fact Sheet, Frequently Asked Questions document, and press release
- Publish Healthy Streams Report
- Publish Sacramento Watershed Coordinated Monitoring Program Year 1 Fact Sheet
- Publish Central Valley Safe-to-Swim Follow-up Study
- Publish Effects of Pyrethroid Insecticides on Surface Waters in the Sacramento-San Joaquin Delta of California
- Publish San Joaquin River Basin Rotational Sub-basin Monitoring: Stanislaus, Tuolumne, and Merced River Watersheds
- Publish San Joaquin River Basin Rotational Sub-basin Monitoring: Westside Basin
- Publish Central Valley Bacteria Source Identification Screening Study
- Publish Nutrient Holding Time Study
- Release San Diego Regional Water Quality Data Portal
- Create and release Healthy Streams Web Portal

Communication and Outreach

- Form Biological Objectives Committees: Stakeholder, Scientific Review, & Regulatory
- Publish SWAMP Revised Strategy as part of the Water Quality Monitoring Council's Comprehensive Monitoring and Assessment Strategy
- Deliver additional Webinars
- Produce and circulate Quarterly Monitor Newsletters
- Release Central Valley Monitoring Directory

Coordination - Partnerships

- Continue to support existing partnerships and forge new partnerships as appropriate