ACHIEVEMENTS REPORTS 2011

Surface Water Ambient Monitoring Program

SWAMP
Surface Water Ambient Monitoring Program

CALIFORNIA
Water Boards

www.waterboards.ca.gov/swamp

FOREWORD

Welcome to the CA State Water Resources Control Board Surface Water Ambient Monitoring Program's 2011 Achievements Report. For over a decade, State and Regional Water Board staff has worked to build a high quality, well respected, and widely recognized surface water monitoring and assessment program (affectionately known as SWAMP). This report summarizes the significant work done in 2011.

By way of introduction, SWAMP's priorities are:

- Statewide and regional monitoring, assessment, and reporting that supports Water Board priorities, informs management decisions, and is transparent to the Legislature and the public;
- Building and maintaining the infrastructure to ensure that the data collected are of known and documented quality and available to the public in a timely fashion;
- Coordination of monitoring efforts among Water Board programs, other public agencies, and private organizations.

As you will see from the various vignettes presented in this report, SWAMP's statewide and regional monitoring efforts have matured to a point where the data regularly are being used to set policy and inform management actions. SWAMP also maintains a robust quality assurance program to ensure that decisions are based on quality, scientifically defensible data. SWAMP data management program ensures that those data are transparent and available to the public via the California Environmental Data Exchange Network (CEDEN). And because the SWAMP cannot monitor and assess everything everywhere, we emphasize the importance of coordinating efforts within the Water Boards as well as with other agencies and entities that monitor California's water resources.

One of the ways SWAMP coordinates monitoring is through participation in the California Water Quality Monitoring Council. SWAMP manages the content for two of the Council's *My Water Quality* web portals that provide information about whether it is safe to eat fish and shellfish from California's lakes, rivers, and coastal waters and whether California's stream and river ecosystems are healthy. These web portals not only inform the public about the condition of California's waterways, but they also foster an opportunity and incentive for multi-agency

collaboration. These collaborative efforts increase efficiency and improve the quality of our assessments by combining data from multiple monitoring efforts. In this time of diminishing resources, we cannot afford not to collaborate and coordinate.
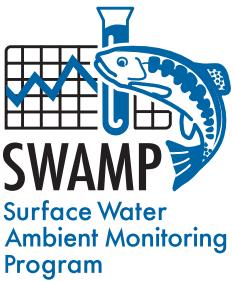
I encourage you to explore SWAMP's achievements in 2011. In doing so I hope you learn something new about California water and possibly find ways that you can get involved to improve assessment and management of this precious resource.

Karen Larsen, Director
Office of Information Management and Analysis

TABLE OF CONTENTS TOC

INTRODUCTION

What is SWAMP?

The mission of 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.

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?

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 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.

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 effect 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 critical management 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.
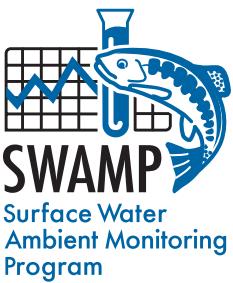
MONITORING

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:

- 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 water quality improvement projects and programs at protecting or restoring beneficial uses?

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 it important?

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 State Environmental and Resource agencies. Regional monitoring and assessment provides rapid feedback for problem management, information to determine the causes and sources of impairments, identification of emerging threats, and evaluation of management effectiveness. Healthy streams, rivers, lakes, bays, estuaries and coastal waters support aquatic life in many ways. They provide 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 that we enjoy. Monitoring provides valuable information on the health of our waters – 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 assessment questions listed above. It can also be used for making management decisions by recognizing that a water body is not meeting water quality objectives and requiring that actions be taken to protect all the beneficial uses of that waterbody. 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.

SWAMP-sponsored Monitoring Projects in 2011:

Statewide Effort

- **Stream Pollution Trends (SPoT) Monitoring Program** – A statewide monitoring program to assess the health of California streams by analyzing sediment contaminants, toxicity, and the correlations with local land use in streams draining large watersheds.

- **Algae as a Second Indicator of Ecosystem Health** – A SWAMP effort to develop and incorporate algae, habitat and riverine wetland indicators into assessments of the ecological health of California's rivers and streams.

Regional Efforts

- **The Russian River Nutrient Study (North Coast Region)** – A study designed to improve understanding of the yearly algal blooms along the Russian River.

- **The Russian River Beaches Monitoring (North Coast Region)** – This program collects and reports bacteria data from freshwater river beaches, addressing both human and environmental health concerns.

- **Garcia River TMDL Implementation (North Coast Region)** – These studies explore the value and importance of this forested watershed, while striving to improve instream conditions for salmon and steelhead. In 2011, the North Coast Region and The Nature Conservancy monitored eight stream reaches in the basin in an ongoing effort to document seasonal variation in the watershed.

- **North Coast Trend Monitoring (North Coast Region)** – Monitoring conducted in a number of large watersheds with the intent to shed light on whether overall water quality conditions are improving in these critical forested drainages.

- **Suisun Bay Study (2011-2012) (San Francisco Bay Region)** – A more intensive follow-up to a study conducted in 2011 measuring phytoplankton growth and nutrient uptake rates in Suisun Bay. Current work focuses on identifying potential growth inhibitors to phytoplankton.

- **CCAMP Continuous Monitoring (Central Coast Region)** – The continuous monitoring element of the Central Coast Ambient Monitoring Program identify streams where dissolved oxygen and temperature conditions are outside tolerance ranges for resident fish. This monitoring also allows better characterization of stream temperature and dissolved oxygen concentrations, which fluctuate daily and seasonally.

- **CCAMP Activities (Central Coast Region)** –The Central Coast Ambient Monitoring Program rotates monitoring efforts among the five major watersheds in the Central Coast Region conducting monitoring in one watershed each year.

- **Solid Phase Adsorption Toxin Tracking (SPATT) Monitoring for Microcystin (Central Coast Region)** – SPATT is an initial screening study to determine the extent to which microcystins (toxins produced by blue-green algae) are present in the Central Coast Region's coastal watersheds.

- **San Gabriel River State of the Watershed Report (Los Angeles Region)** – The San Gabriel River Watershed Program recently released a State of the Watershed report based on five years of monitoring data (2005-2011). The report assesses the ecological condition of streams in the watershed, whether it is safe to swim and whether locally caught fish are safe to eat.

- **Santa Clara River Watershed Program (Los Angeles Region)** – A regional, collaborative monitoring program to measure water quality, toxicity and biological and habitat condition in the Santa Clara River watershed. The objectives of this program are to increase awareness of the importance of issues at the watershed scale. The program also improves coordination and integration of monitoring efforts for both compliance and to assess ambient stream conditions.

- **Pyrethroid Study Cache Slough (Central Valley Region)** –This study is designed to investigate the principal routes by which pyrethroids are entering the Cache Slough complex during the February to June period when the habitat is used by spawning Delta smelt.

- **Harmful Cyanobacteria in Clear Lake and the Delta (Central Valley Region)** – This study is designed to identify and characterize the presence of harmful cyanobacteria and their toxins in two large and complex California waterbodies known to experience cyanobacteria blooms: Clear Lake and the Sacramento-San Joaquin Delta.

- **Vernal Pool Monitoring (Central Valley Region)** –The purpose of the study is to collect data on water quality and physical pool characteristics to assess the health of vernal pools. This monitoring is located in the vernal pools of the alkali sink habitat (seasonally flooded areas with saline soils that support plants adapted to survive in these conditions) of the California Department of Fish and Game Ecological Reserves.

- Seasonal Trend Monitoring at Central Valley Integrator Sites (Central Valley Region) – Completed the third year of sampling for seasonal trend monitoring at Central Valley integrator sites.

- Sacramento Watershed Coordinated Monitoring Program (Central Valley Region) – Completed the third year of sampling for the SWCMP

- Safe to Swim Monitoring Program (Central Valley Region) – Completed the fifth year of Safe to Swim Monitoring with an expanded sampling design to monitor swimming holes throughout the summer recreation season.

- Grasslands Bypass Project (Central Valley Region) – Concluded sampling in June 2011 after sixteen years of coordination with other agencies and programs.

- **Pesticide Study (Colorado River Region)** – This study looks at legacy pesticide concentrations in both water and fish tissues along agricultural drains and rivers that flow into the Salton Sea.

- **Contaminants of Emerging Concern (San Diego Region)** – In the past several years, the San Diego Water Board conducted pilot studies on several different Contaminants of Emerging Concern (CECs). In 2009, the San Diego Water Board carried out a study on polybrominated diphenyl ethers (PBDEs) that are used in flame retardants. In 2010/11, pharmaceuticals and personal care products (PPCPs) were sampled in surface waters throughout the San Diego Region. The San Diego Water Board is focusing on cyanobacteria and microcystin in 2012.

- **Freshwater Wetlands in Southern California (Los Angeles, Santa Ana and San Diego Regions)** – This study assess the condition and stressors associated with the beneficial uses of southern California depressional wetlands.

- **Stormwater Monitoring Coalition (SMC) (Los Angeles, Santa Ana and San Diego Regions)** – The SMC is a collaborative effort between 14 regulated, regulatory, and research entities located in southern California. The SMC designed a study for the first comprehensive assessment of the health of streams in southern California. Sampling for this study started in 2009 and is ongoing.
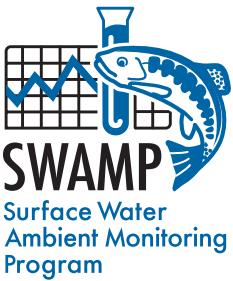
ASSESSMENT

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. It may also incorporate statistical analyses to evaluate average conditions across the landscape at a point in time, or to describe trends in condition over time. Assessment 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?

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 (CWA) §) 305(b) reports on the status of water quality in California, and §303(d) listings of impaired waters throughout the State.

Assessments help us to know many things about our State's water including: how healthy our rivers and streams are, how quickly the health of our water bodies are changing and whether they are getting better or worse. They can also inform us on whether fish caught at popular fishing spots are safe to eat and what has caused water quality problems at a particular waterbody.

How will this information be used?

SWAMP assessments are contained in interpretive reports, web-based information products, fact sheets, 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:
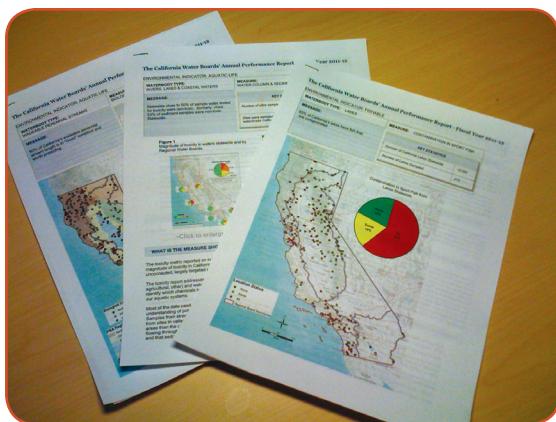

- Providing context for specific water resource issues.

- Developing and evaluating water quality indicators, such as chemical measurements, biological and ecological metrics, toxicity endpoints, and field observations that adequately and repeatedly characterize environmental conditions.

- Setting assessment thresholds (values against which to compare measurement data) to determine whether water quality is sufficient to support its designated beneficial uses.

- Developing assessment tools to compare measurements (statistically or otherwise) with assessment thresholds in order to evaluate resource condition.

- Establishing a statewide assessment framework that describes the types of data needed from all partners to adequately answer the State's priority assessment questions.

SWAMP-sponsored Assessments in 2011:

Statewide Effort

- **The 8-Year Perennial Streams Assessment (PSA) Report** – The PSA report is the compilation of data collected from several programs over and eight year period from 2000-2007 which focuses on the ecological condition of the State's perennial streams.
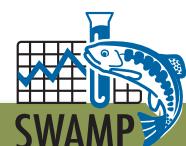
- **Reference Condition Monitoring Program (RCMP)** – SWAMP's RCMP has implemented a strategy to target and sample the highest quality (healthy) streams in California as a foundation for developing statewide biological objectives and for establishing a framework to identify and protect healthy watersheds.

Regional Efforts
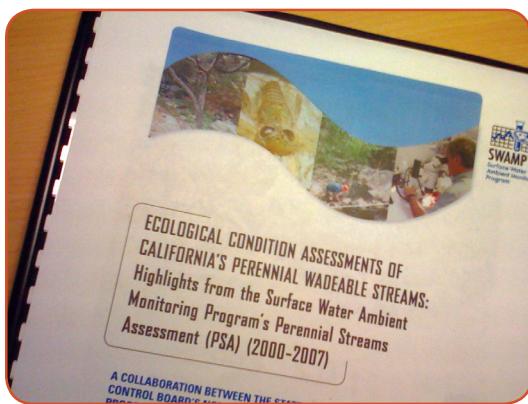
- **Central Coast Assessment of Agriculture Impacts Report (Central Coast Region)** – The Central Coast Ambient Monitoring Program released a report which assesses of water quality in agricultural areas of the Central Coast Region.

- **Bacteria Source Identification in the Central Valley (Central Valley Region)** – A Central Valley Region study which investigates bacterial occurrence in public waters and determines its potential sources.

- **Sediment TIE (Toxicity Identification Evaluation) (Central Valley Region)** – This Central Valley based study was designed to improve procedures for extracting and recovering two pesticides of concern (chlorpyrifos and bifenthrin) from sediment interstitial water.

- Safe to Swim Report and Fact Sheet (Central Valley Region) – A final report and fact sheet for Safe to Swim monitoring conducted in June 2009.

- Grasslands Bypass Project Annual Report 2008-2009 (Central Valley Region) – SWAMP contributed to the report and published a fact sheet for the Grasslands Bypass program.

- **Bioassessment Monitoring in the Santa Ana Region (Santa Ana Region)** – Continued ongoing bioassessment monitoring of wadeable streams in the Santa Ana Region to assess overall stream health, identify waters where biological integrity is impaired, and determine actions to improve water quality in impaired streams.

- **Postfire Report (San Diego Region)** – This study was designed to look at post-fire conditions in Southern California water bodies to determine how wildfires impact biological conditions in streams, look at recovery times and how they differ between developed and undeveloped watersheds, and to determine the primary mechanism by which wildfires affect biological conditions in streams.

- Fish Consumption Advisories (San Francisco and Lahontan Regions) – Information from SWAMP monitoring of fish tissue is used to develop Fish Consumption Advisories. The monitoring results are provided to the CalEPA's Office of Environmental Health Hazard Assessment (OEHHA), which develops, publishes, and disseminates safe eating guidelines for specific water bodies.

- **Trash Assessment in Southern California (Los Angeles, Santa Ana and San Diego Regions)** – A regional pilot project trash survey conducted at sites across southern California watersheds which assess the extent and magnitude of trash on southern California streams.
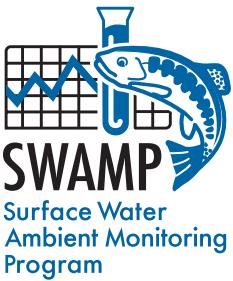
COMMUNICATION AND OUTREACH

What is it?

An important part of scientific inquiry is the communication of results. SWAMP communicates by sharing the analysis of its monitoring data through reports, presentations and web-based interactive materials. SWAMP monitoring produces data that program scientists evaluate, analyze, and present as information to answer water quality assessment questions.

Why is it important?

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. 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 technical reports on its statewide and regional monitoring programs such as the Bioaccumulation Monitoring Program, the Perennial Streams Assessment (PSA), Stream Pollution Trends (SPoT), as well as Special Studies such as the Statewide Toxicity Report; and provides data to support the 305(b)/303(d) Integrated Report. SWAMP also releases fact sheets and management memos on specific issues, and produces meeting presentations for agencies, partners, and the public.

How will this information be used?

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

- Interpretive reports providing assessments from key SWAMP programs on important water quality issues.

- 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.

- Fact sheets, management memos, newsletters and other media with highlights of SWAMP activities.

- Data submitted to the SWAMP database and made available to the public through the California Data Exchange Network (CEDEN).

- Webinars and Powerpoint presentations describing projects and activities of SWAMP and partner organizations.

- An annual Achievements Report that describes current SWAMP activities and highlights annual accomplishments.

- Electronic email updates to alert partners and stakeholders to the availability of recent documents.

SWAMP Communication and Outreach efforts in 2011:

Statewide Effort

- **Clean Water Team (CWT) Efforts: Online Resources for Citizen Monitors** – Citizen Monitors and many others are provided a broad variety of online resources, including a calendar and YouTube demonstration videos. All of these resources are available on the internet.

- **SWAMP Graphics** - The SWAMP staff produced grpaphics summarizing statewide water and/or sediment toxicity for a variety of coastal waters, lakes and reservoirs, and streams.

- **California Water Quality Monitoring Collaboration Network Webinars** - The Clean Water Team and the Collaboration Network produced eleven informative webinars in 2011.

- **SWAMP Monitor Newsletter 2011**

Regional Efforts

- **California Stormwater Quality Association (CASQA) Training (Central Coast Region)** – Training presented at the CASQA conference provided a comprehensive overview of construction stormwater monitoring considerations for a wide variety of individuals active in this area.

- **Central Valley Monitoring Directory (Central Valley Region)** – Continued outreach for the Central Valley Monitoring Directory including the California Water Quality Monitoring Council, state agencies, and citizen monitoring groups.

- **Safe to Swim Citizen Monitoring Training (Central Valley Region)** – Citizen monitoring groups participating in the Safe to Swim monitoring were provided training on the use of SWAMP field sheets and field sampling protocols.

- **Scientific Presentations (San Diego Region)** – Staff from the San Diego Region made a presentation entitled, "Ten years of bioassessment data from a regulators' perspective: What does the data tell us, and how do we move forward?," at a meeting of the North American Benthological Society. They also presented at a meeting of the New England Aquatic Environmental Biologists Association a review titled. "Biological Integrity in Urban Stream Systems - An Example from Southern California."
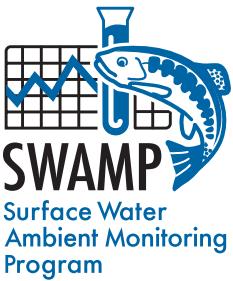
COMPARABILITY

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.

An enormous amount of data is collected to track the condition of aquatic resources throughout the state. SWAMP works to collect, manage and disseminate accurate environmental data of known quality in order to facilitate effective management decisions. Efforts include quality assurance (QA), guidance and data management. These activities are carried out with programmatic support from SWAMP Quality Assurance Team (QAT) and the Data Management Team (DMT). The QAT creates, maintains and implements many components of the SWAMP QA program such as the SWAMP Quality Assurance Program Plan (QAPrP), Standard Operating Procedures (SOPs), the SWAMP Help Desk, laboratory audits, as well as webinars and other training activities. The DMT is responsible for managing data from SWAMP funded State and Regional board projects. The DMT manages the SWAMP database and works to ensure that data of known and documented quality are available to managers and stakeholders in a timely manner.

All SWAMP data are stored in the SWAMP Database and made available to the public via the California Environmental Data Exchange Network (CEDEN). CEDEN was developed to simplify and improve access to California's water resource monitoring data by providing services that integrate, standardize and display data from the state's many diverse monitoring and data management efforts.

Why is it important?

In the past, funding was invested in projects that generated valuable data and resulted in a tremendous increase in knowledge about ambient water quality. However, it was difficult and not always possible to evaluate or summarize data across projects to answer general management questions on the condition and trends of California's waters.

The guidance and tools provided by SWAMP allow researchers and managers to effectively and efficiently combine data across programs and projects, contributing to better informed management decisions and cost savings.

How will this information be used?

The high quality data that SWAMP and its partners collect and manage provides information that can be used to conduct water quality assessments to help answer questions, such as:

- How well are we managing California's water resources?
- 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? How well does do our surface waters support aquatic life?
- Are we investing our limited state resources effectively and focusing them on the right water quality problems.

SWAMP comparability resources are available to other state, federal, and local agencies as well as monitoring groups who conduct ambient water quality monitoring in California. The use of these tools helps to ensure comparability of data. They also ensure that the data collected will be of known and documented quality.

COMPARABILITY - QUALITY ASSURANCE TEAM

What is it?

Quality Assurance (QA) is an integrated system of management activities that is intended to increase confidence in a product. The SWAMP QA system is managed by the program's QA Team (QAT). The QAT is staffed by the QA Research Group at Moss Landing Marine Laboratories. The QA Research Group is made up of six environmental scientists with experience in biology, ecology, chemistry, hydrology, toxicity testing, databases, and statistics. This expertise is used to create, maintain, and implement the following components of SWAMP's QA system:

- Surface Water Ambient Monitoring Program Quality Assurance Program Plan (QAPrP): This comprehensive planning document is created and maintained by the SWAMP QAT, and provides an overview of SWAMP's QA systems – including many of those described below. It is referenced by program participants, projects seeking SWAMP comparability, laboratories, field organizations, data managers, and end-users.

- Quality Assurance Project Plan (QAPP) Tools: While SWAMP maintains its own QAPrP, SWAMP-funded and SWAMP-comparable projects benefit from writing a project QAPP. To assist in this process, the SWAMP QAT provides a QAPP template and QAPP-creation software, as well as a checklist that may be used to review draft QAPPs.

- Quality Assurance Project Plan Review: To facilitate the QAPP-creation process for SWAMP-affiliated projects, the QAT performs comprehensive reviews of all SWAMP funded QAPPs, as well as many SWAMP-comparable QAPPs. These reviews ensure that each QAPP enters the approval process having met SWAMP and EPA requirements.

- Standard Operating Procedures (SOPs): These technical procedural documents ensure complete and consistent performance of recurring scientific processes. Because QA is an integral part of any SOP, the QAT is closely involved in the production of any SWAMP-related SOP. The QAT also creates, maintains, and implements numerous process documents, which are simplified SOPs pertaining to recurring, yet non-technical, SWAMP protocols. While these documents are largely for internal use, they are made publically available in the interest of programmatic transparency.

- Measurement Quality Objectives (MQOs): Most programs ensure data consistency by mandating the use of specific laboratory and field methods. Unfortunately, this approach discourages analytical flexibility and innovation. In response, SWAMP has been designed to allow the use of any method that is capable of achieving programmatic MQOs. These MQOs are numerical performance goals that must be met by all SWAMP data contributors. Ultimately, data that has been subjected to the same MQOs may be considered usable for the same environmental decision.

- Reporting Limits (RLs): An RL is a minimum concentration of a pollutant that is of particular interest or relevance to a project or program. The QAT is currently working to establish RLs that will be referenced by all SWAMP data contributors. These program-specific RLs will ensure that analyses are addressing concentration ranges that are consistent and appropriate for SWAMP's data users.

- Laboratory Audits: The QAT periodically audits SWAMP-contracted analytical laboratories against the requirements of the QAPrP. This ensures consistency within and among the program's primary data generators.

- Corrective Actions: When deviations from the SWAMP QAPrP occur, it is important to correct them, but also to document and follow-up on those corrections. The QAT has created a formal process for corrective actions affecting SWAMP data. In it, all involved parties work with the QAT to describe the deviation, propose corrective actions, and evaluate the success of those corrective actions.

- Database Assessments: Just as it assesses SWAMP's contract laboratories, the QAT also audits data that is already being stored in the programmatic database. Typically, these assessments involve a subset of data within the database, and seek to identify recurring failures or other noteworthy trends.

- Help Desk: The QAT staffs a phone- and email-based Help Desk to assist programs, projects, or other entities seeking comparability with SWAMP. The Help Desk provides guidance and resources pertaining to SWAMP QAPrP interpretation, QAPP-creation, and quality control (QC).

- Training: While the QAT has created numerous systems to simplify SWAMP QA, it is understood that much of the subject matter may still be unfamiliar or confusing. Consequently, the QAT supplements its other resources with frequent in-person and online training sessions, as well as a kickoff meeting at the initiation of new projects.

- Coordination: The QAT routinely meets with the SWAMP Roundtable, State Board QA Roundtable, SWAMP QA Workgroup, and other QA-related organizations. In addition, it frequently partners with State and federal government agencies (e.g., United States Geological Survey, Environmental Protection Agency, California Department of Fish and Game), non-profits (e.g., San Francisco Estuary Institute, Southern California Coastal Water Research Project), as well as the private sector. Each Regional Board, SWAMP-funded project, and environmental parameter group has a dedicated liaison within the QAT. Liaisons stay current with regional and project activities, technical advances, corrective actions, kickoff meetings, and QAPP reviews.

Why is it important?

There is a seemingly limitless amount of environmental data available in California. Unfortunately, this data cannot always be consolidated because it may be of unknown quality and comparability. The QAT creates and facilitates a framework within which all SWAMP contributors can generate data that is defensible. This enables the data user to compare data, which greatly increases the amount and scope of information available for their decision-making.

How will this information be used?

These SWAMP QA systems are relevant to all stages of environmental data collection – from project planning to data reporting. This means they are utilized by project management, field organizations, laboratories, QA staff, data managers, and end-users. Further, when shared with partner programs, these same systems produce comparable data from many sources that are usable in comprehensive water quality assessments.

COMPARABILITY - DATA MANAGEMENT TEAM

What is it?

The Data Management Team (DMT) is responsible for managing data from SWAMP funded State and Regional board projects. The DMT manages the SWAMP database and works to ensure that data of known and documented quality are available to managers and stakeholders in a timely manner.

SWAMP data are managed by the Marine Pollution Studies Laboratory at Moss Landing Marine Laboratories which is a consortium institution for seven California State University campuses. Once the data have gone through SWAMP completeness and verification processes, the data are exported to the California Environmental Data Exchange Network (CEDEN) database.

Why is it important?

The SWAMP receives data from multiple sources, including the State and Regional Boards as well as outside organizations that are required to submit SWAMP-comparable data. These data are needed by staff to conduct accurate assessments and make informed decisions regarding the State's water quality. If the data are not comparable or readily accessible they are often times difficult and time consuming to utilize. The DMT develops standardized procedures for data collection and management so that the data are comparable even though they originate from many sources. Once data are transferred to CEDEN, SWAMP data are combined with many other data sets from around the state all being made available to the public in a comparable manner. This allows staff to quickly and easily access and integrate a wide array of data for analysis on which water quality management decisions are made. CEDEN has four regional data centers which are networked together for better regional coordination with data submitters and interests.

Another added benefit of comparable data allows a user to summarize various outputs from the Bioassessment Reporting Module. Having consistently reported data enables a data user to run metrics for stations across multiple projects and compare results using similar metrics.

How will this information be used?

The data managed by the DMT is used for the water quality assessments conducted by SWAMP such as evaluations of fish consumption safety and aquatic ecosystem health, as well as other efforts including the identification of impaired waters under the Clean Water Act 303(d) and 305(b) requirements for preparing the State Water Board's Integrated Report. These assessments inform and guide management actions aimed at protecting and restoring the quality of the State's waters.

SWAMP COMPARABILITY EFFORTS IN 2011

Statewide Effort

Quality Assurance Team

- Quality Assurance Project Plans (QAPPs) – Performed five QAPP reviews pertaining to bacteria, algae, pyrethroids and other parameters; maintained and updated three key tools for SWAMP QAPP development.

- Standard Operating Procedures (SOPs) – Assisted in creating SOPs for laboratory analysis of benthic macroinvertebrates and bioassessment training.

- Quality Assurance Oversight – Procedural documents developed and released pertaining to Corrective Action, Creation and Approval of Programmatic Standard Operating Procedures, Review of Program-Funded Quality Assurance Project Plans, and Help Desk Review of Quality Assurance Project Plans

- Laboratory Audit – Conducted an onsite audit of the Moss Landing Marine Laboratories' Marine Pollution Studies Laboratory

- Measurement Quality Objectives – Developed Measurement Quality Objectives (MQOs) for bacteria, toxicity testing, field measurements and marine water and established SWAMP reporting limits.

- Help Desk – Provided over 1000 hours of service to organizations, projects and programs via the SWAMP Help Desk.

- Webinar – Presented webinar: How to Select and Work with a Laboratory

Data Management Team

- Conducted database management and data dissemination activities for seven statewide and fifty-one regional projects.

- Improved the integration of biological data into the SWAMP database by developing a reporting module for bioassessment benthic and physical habitat data.

Regional Efforts

- QAPP Development (Central Valley Region) – Developed a QAPP for the Cyanobacteria Study for Harmful Cyanobacteria Blooms and their Toxins in Clear Lake and the Sacramento-San Joaquin Delta.
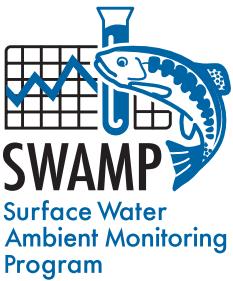
COORDINATION

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 assessments.

SWAMP COORDINATION EFFORTS IN 2011:

- Regional Monitoring Coalition Creek Monitoring (San Francisco Region) – This project will help determine which streams are in poor condition. It will also begin to identify potential stressors causing the observed ecological degradation.

- Regional Monitoring w/ Areas of Special Biological Significance (ASBS) & Stormwater Program (Central Coast Region) – Several agencies are working together to develop a regional monitoring approach that addresses multiple program requirements and answers important questions about the impact of discharges on Monterey Bay.

- Grassland Bypass Project (Central Valley Region) – A multi-stakeholder effort to manage selenium discharges from the Grassland Drainage Area of the Central Valley.

- Monitoring efforts in the Sacramento-San Joaquin Delta are being coordinated with the Interagency Ecological Program (Central Valley Region) – In 2011, SWAMP expanded the Interagency Ecological Program (IEP) monitoring projects to provide information on cyanobacteria blooms in the Delta, and the sources of pyrethroids to the Cache Slough Complex.

- Safe to Swim Monitoring (Central Valley Region) – SWAMP staff in the Central Valley Region coordinated with the following citizen groups to conduct Safe to Swim monitoring in 2011: Sierra Streams Institute, Dry Creek Conservancy, Tuolumne River Trust, American River Conservancy, Upper Merced River Watershed Group, River Tree Volunteers, and South Yuba River Citizen's League.

- Bioassessment in the Lake Tahoe Basin (Lahontan Region) – The bioassessment information gathered will allow all entities involved to cost-effectively judge stream health in their jurisdiction or area of interest within the Lake Tahoe Basin.

SWAMP PARTNERS

- California Water Quality Monitoring Council
- California Environmental Data Exchange Network Regional Data Centers
- California Department of Fish and Game
- California Office of Health Hazard Assessment
- US Environmental Protection Agency
- San Francisco Estuary Institute
- Southern California Coastal Water Research Project
- Moss Landing Marine Laboratories, Marine Pollution Studies Laboratory
- California Department of Fish and Game, Aquatic Bioassessment Laboratory
- UC Davis Marine Pollution Studies Laboratory at Granite Canyon
- UC Davis Aquatic Toxicology Labs
- Klamath Basin Monitoring Program
- San Francisco Estuary Regional Monitoring Program
- Delta Water Quality – Comprehensive Monitoring Program

- Sacramento Watershed Coordinated Monitoring Program
- Grasslands Bypass Project
- San Joaquin River Restoration Program
- Stormwater Monitoring Coalition
- Los Angeles River Watershed Monitoring Program
- San Gabriel River Regional Monitoring Program
- Southern California Bight Regional Monitoring Program
- Central Valley Monitoring Directory
- State and Federal Contractors Water Agency

STATE WATER BOARD PARTNERS

- Irrigated Lands Regulatory Program
- Bay-Delta Program – San Francisco Bay/ Sacramento – San Joaquin Delta Estuary Program
- Dredge/Fill (401) and Wetlands Program
- Clean Water Team – Citizen Monitoring
- Nonpoint Source Pollution Control Program
- NPDES Permitting Program
- Ocean Standards Program
- Areas of Special Biological Significance (ASBS)
- Stormwater Program
- Total Maximum Daily Load Program

MANAGEMENT DECISIONS

Data are routinely used by the State Water Resources Control Board and the nine Regional Water Quality Control Boards to inform assessment reports, make enforcement decisions, develop permits and program priorities, and to make Clean Water Act 303(d) listing and 305(b) reporting decisions.
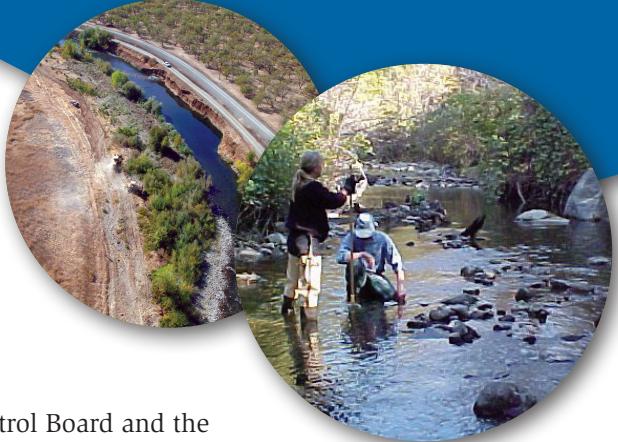
Examples of specific management decisions in 2011 include:

- Central Coast Agriculture Order (Central Coast Region) – The Central Coast Agriculture Order is a ground-breaking order. Among other requirements, this order defines high risk growers based on crop type, acreage, location relative to impaired waters, and pesticide use. This order also requires individual monitoring by those growers, and requires groundwater monitoring for nitrate concentrations.

- In the Central Coast Region, CCAMP/SWAMP data was used, in combination with storm water permit data and agricultural cooperative monitoring program data, to evaluate the impact of storm water and dry season discharge into the Salinas River and the Tembladero Slough systems. This analysis supported the monitoring requirements in the Monitoring and Reporting Program for the City of Salinas storm water permit. CCAMP data informed at least four other NPDES permit renewals and a proposal to conduct a Use Attainability Analysis for San Luis Obispo Creek. It also helped inform the Region 3 update on the Department of Water Resources Water Plan, as well as an EPA Measure W report on Chorro Creek. It was used to investigate possible illicit discharges by mushroom farms and fertilizer/pesticide distributors prior to issuance of a Notice of Violation. CCAMP data was used extensively in development the Santa Maria area nutrient and fecal indicator TMDLs, the Los Berros Creek nitrate TMDL, the lower Salinas River nutrient TMDL, and the San Antonio Creek chlorpyrifos TMDL. It was also used in the development of two reports to develop a Hydromodification Control

Methodology for the Region, including a watershed characterization and a linkage analysis to receiving water conditions, and was used to confirm basic conditions in receiving waters affected by urbanization.

• The San Diego Water Board SWAMP Strategy (San Diego Region) – The San Diego Water Board identified effective monitoring and assessment as a top strategic priority following a 16-month office-wide Executive Leadership Development Program led by the University of California Davis Extension Program. The SWAMP strategy and SWAMP data will be the foundation for developing and implementing a new framework for monitoring and assessment in the San Diego region. The framework coordinates the monitoring work done by the San Diego Water Board, regulated parties, and other stakeholders in order to better assess the condition of receiving waters, promotes strong environmental outcomes, and drives decision making.

• Biological Objectives – SWAMP bioassessment data are being used to develop biological objectives for the perennial streams of California. Biological objectives will help improve water quality in our streams and rivers by providing the narrative or numeric benchmarks that describe conditions necessary to protect aquatic life beneficial uses.