SWAMP Strategy

CA Surface Water Ambient Monitoring Program (SWAMP)

2024-03-01

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Welcome!

Welcome to the Surface Water Ambient Monitoring Program (SWAMP) Strategy!

This is an online reference and resource written by the California State Water Resources Control Board (State Water Board) SWAMP Team. The SWAMP Team is composed of multiple team members at the State Water Board within the SWAMP Unit, SWAMP Information Management and Quality Assurance Center (SWAMP IQ), and others in the Office of Information Management and Analysis (OIMA).

Content in this SWAMP Strategy includes strategic and tactical planning documentation for SWAMP's Science and Data Communication projects and Statewide Programs, including Bioaccumulation, Bioassessment, Freshwater Harmful Algal Blooms, and Toxicity and Contaminants programs.

Overarching programmatic strategies and drivers (i.e., State Water Board Strategic Plan, Open Data Resolution, etc.) are described in the About SWAMP section.

For each of the statewide programs and projects, planning documentation is organized into two broad categories (1) mid-term program plans and (2) short-term program plans.

Mid-term Program Plans: 3-5 year plans

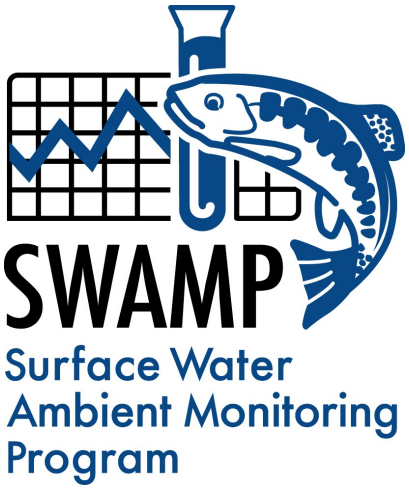
- Quality Assurance Program Plans
- Monitoring Plans
- Data Management
- Communication and Engagement Plans
- Multi-Year Budgets
- Monitoring Standard Operating Procedures (SOPs)
- Data Management and Analysis SOPs

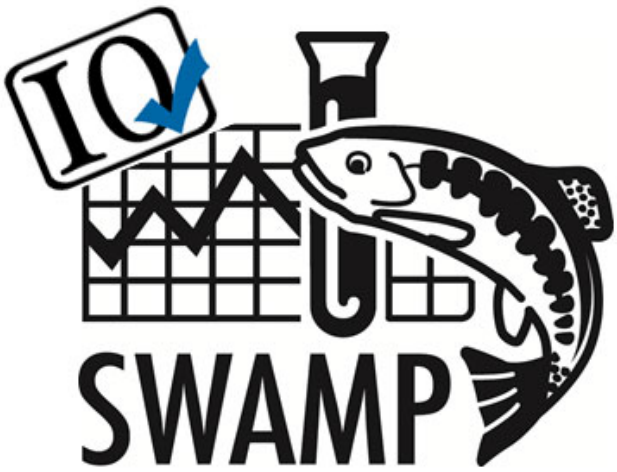
Short-term Program Plans: 1 year

- Annual Monitoring Plan
- Annual Budget
- Individual Program Work Plan

Other relevant program information including program partners and networks are also included.

This Quarto book is an open, living, and continuously iterating resource. If you have suggestions for additions or revisions you think should be incorporated into this book, please follow the guidance provided in the Contributing chapter.





Part I

SWAMP

1 About SWAMP

1.1 Overview: SWAMP

SWAMP sits within the Water Board's Office of Information Management and Analysis (OIMA), which serves as an advocate for data management, a bridge between data collectors and users, as well as, provides transparency of the Water Board's information management infrastructure.

> The SWAMP mission is to provide resource managers, decision makers, and the public with timely, high-quality data, information and tools needed to evaluate the condition of all surface waters throughout California.

SWAMP accomplishes this through carefully designed, externally reviewed statewide and regional surface water monitoring programs, and by assisting other entities state-wide in the generation of comparable data that can be brought together in integrated assessments that provide answers to current management questions. In addition to providing information and tools, SWAMP's vision is to help enhance monitoring, assessment and reporting activities throughout the Water Boards.

Statewide SWAMP Monitoring Programs include:

- Bioaccumulation Monitoring Program
- Bioassessment Program
- Freshwater and Estuarine HABs Program
- Toxicology and Contaminants Program

> **Note**
>
> Reminder to add icons and new links when ready

1.2 Overview: SWAMP IQ

> SWAMP IQ strives to promote question-driven monitoring, and to ensure the highest quality data is used to evaluate the health of California's water bodies.

SWAMP IQ assists ambient monitoring projects and programs throughout the state by offering resources that support each stage of water quality monitoring, from sample collection to data entry, as well as providing quality assurance review, verification, and data storage.

1.3 SWAMP Resources

Purpose	Title & Weblink
Overview of SWAMP	SWAMP Website
Overview of SWAMP IQ	SWAMP IQ Website
Current SWAMP program priorities and strategies	SWAMP Strategic Action Plan, 2020-2023
Detailed overview of SWAMP monitoring standards and requirements	SWAMP Quality Assurance Program Plan (QAPP), 2022-2024
Overview of OIMA	OIMA Website
Strategic actions to improve the way the Water Boards use data and information about CA water resources	State Water Resources Control Board Strategic Data Action Plan (SDAP), draft
Projects carried out in the SDAP	State Water Resources Control Board SDAP, project portfolio summaries

Part II

Bioaccumulation

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3 Who are our partners?

3.1 Overview

Understanding and addressing issues and impacts of bioaccumulation throughout all California waterbodes is nuanced and complex, and therefore requires multiple partners working together to achieve common goals. The SWAMP Bioaccumulation Monitoring Program (Program) and Safe to Eat Workgroup (STEW) are highly collaborative, and we're always looking for new collaborators and partners!

3.2 Partner Network

Below is a visual representation of the partners currently in our network as well as descriptions of and links to partner websites.

Figure 3.1: Network map of STEW and Program partners

3.2.1 SWAMP Bioaccumulation Monitoring Program Contractors

Moss Landing Marine Laboratories' (MLML) Marine Pollution Studies Laboratory (MPSL): Our MLML/MPSL partners lead the sample collection and processing efforts.

San Francisco Estuary Institute (SFEI): Our SFEI partners lead the data analysis, interpretation and reporting process, and help Co-chair the STEW!

3.2.2 Other SWAMP Programs

SWAMP Regional Monitoring Programs: Many Regional SWAMP Programs augment the efforts of the Statewide Bioaccumulation Monitoring Program, or conduct bioaccumulation related studies of their own to address regionally-specific water quality concerns.

SWAMP Information Management and Quality Assurance Center (SWAMP IQ): SWAMP IQ conducts a thorough quality assurance review and verification of all of our data before adding the data to our public data systems.

SWAMP Statewide Freshwater and Estuarine Harmful Algal Bloom (FHAB) Program: We're working with the FHAB Program to better understand the nexus between harmful algal blooms and bioaccumulation risks.

SWAMP eDNA Metabarcoding Monitoring and Analysis Project (SeMMAP): We're beginning to work with SeMMAP to better understand the extent to which environmental DNA (eDNA) can be used to support our monitoring efforts.

3.2.3 Other Monitoring Efforts

Whenever possible, we try to collaborate with other bioaccumulation monitoring programs, including:

- Regional Monitoring Program for Water Quality in San Francisco Bay (Bay RMP)
- Southern California Bight Regional Monitoring Program (Bight RMP)
- The Delta Regional Monitoring Program (Delta RMP)
- Marine Biotoxin Monitoring Program
- US EPA National Aquatic Resource Surveys
  - The National Coastal Condition Assessment (NCCA)
  - The National Lakes Assessment (NLA)
  - The National Rivers and Streams Assessment (NRSA)
  - The National Wetland Condition Assessment (NWCA)
- Biomonitoring California

3.2.4 Other California State Agencies

We work closely with other CA State Agencies to make sure our data is used to protect public health, and is communicated effectively in the public health space so that those that are most impacted by consuming contaminated fish and shellfish can make informed decisions to reduce their exposure to harmful pollutants in fish and shellfish.

- The Office of Environmental Health Hazard Assessment (OEHHA) is the lead state agency for the assessment of health risks posed by environmental contaminants. OEHHA uses our data to develop site specific and statewide fish advisories.
- The California Department of Public Health (CDPH) is the state department responsible for public health in California. We're building stronger relationships with some of their programs (e.g., Center for Healthy Communities) to more efficiently and effectively achieve our respective missions.
- The California Department of Fish and Wildlife (CDFW) is the state department responsible for managing California's fish, wildlife, and plant resources, and the habitats upon which they depend. We're building stronger relationships with some of their programs (e.g., Regional monitoring experts, Fishing in the City) to more efficiently and effectively achieve our respective missions.

3.2.5 Other State and Regional Water Board Programs

The State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards), collectively known as the California Water Boards (Water Boards) are dedicated to a single mission:

> To preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations.

Under the federal Clean Water Act (CWA) and the state's pioneering Porter-Cologne Water Quality Control Act, the State and Regional Water Boards have regulatory responsibility for protecting the water quality of nearly 1.6 million acres of lakes, 1.3 million acres of bays and estuaries, 211,000 miles of rivers and streams, and about 1,100 miles of exquisite California coastline!

There are a number of programs that partner with us and/or use our data to inform their work, including:

- Tribal Affairs and their Tribal Beneficial Use efforts
- Statewide Mercury Control Program
- Integrated Report Program
- TMDL Programs
- Bacteria Objectives
- Biostimulation, Cyanotoxins, and Biological Condition Provisions
- Ocean Standards Unit
- Wetlands Program
- Constituents of Emerging Concern (CEC)

- Per- and Polyfluoroalkyl Substances (PFAS)

For more details on how our data are used in some of these programs, see:

- How are bioaccumulation data used to protect and restore water quality in CA?
- How are bioaccumulation data used to protect human health in CA?
- General bioaccumulation data use FAQs

3.2.6 California Native American Tribes & Tribal Organizations

California Indian Environmental Alliance (CIEA): We work closely with our CIEA partners on a number of bioaccumulation related projects. CIEA is also an active member of the STEW!

We're working on building more relationships with California Native American Tribes through the Program's equity initiatives. See the Tribal Engagement FAQ for more information on how tribes and tribal organizations can engage with the Program and/or the STEW.

3.2.7 Other California Water Quality Monitoring Council Workgroups

Equity Workgroup: STEW Co-chairs are actively involved with this Workgroup and its efforts to operationalize equity in all levels of the Council.

We're working on building stronger partnerships with the following Workgroups:

- California Cyanobacteria and Harmful Algal Bloom (CCHAB) Network
- California Estuary Monitoring Workgroup
- California Water Quality Monitoring Collaboration Network
- California Wetland Monitoring Workgroup
- Healthy Watersheds Partnership
- California Ocean & Coastal Ecosystem Workgroup

3.2.8 Academic Institutions

We're working on building more relationships with the academic community so we can leverage our partnerships, advance needed research, and connect with emerging academics and future scientists and leaders of California! Partner academic institutions include:

- CSU-WATER (Water Advocacy for Education and Research)
  - CSU Northridge Water Science Lab
- CSU COAST (Council on Ocean Affairs, Science & Technology)

Are you at an academic institution conducting research related to bioaccumulation, fish advisory development, and/or statewide bioaccumulation monitoring efforts - but are not included in the list above? Please let us know by emailing the SWAMP Bioaccumulation Monitoring Program Coordinator & STEW Co-chair at Anna.Holder@waterboards.ca.gov!

Part III

Bioassessment

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Part IV

FHABs

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Part V

Toxicology & Contaminants

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7 Contributing

7.1 Who can contribute

Currently, only members of the SWAMP Team are able to actively contribute to this manual.

7.2 How we contribute

We develop the content for this SWAMP Manual using RStudio, build the book using Quarto (via RStudio), and collaborate and publish using GitHub (also via RStudio).

If you are *NOT* a member of the SWAMP Team, but have suggestions for additions or revisions you think should be incorporated into this book, please [**TBD].**

7.2.1 Setup

To contribute, SWAMP Team members must do the following, and it should only take about 20 minutes to complete:

1. **Install R and RStudio**

   Both R and RStudio should be available in the Software Center (for Windows 10) or Company Portal (for Windows 11) – if you don't see them in your Software Center/Company Portal or you have issues/questions during the instillation process, please send a request to the DIT HelpDesk and they can help you install them.

   Also see these step by step instructions on how to install these programs – you will only need to go through steps 1 and 2

   If you are new to R, it would also be helpful if you could review the Getting Started Module so you can begin to familiarize yourself with the fundamentals of the program.

2. **Install Quarto**

   Quarto download and install instructions

3. **Create a GitHub Account**

   Create your free personal account GitHub account

   Tips on choosing your username

4. **Download and Install Git**

   Follow your operating system's normal Git installation process. Note: you will not see an application called Git listed but if the installation process completed it was likely successful, and we will confirm together.