



# Long-term Monitoring Plan for the Bioaccumulation Monitoring Program

2025 - 2029

PREPARED FOR THE  
SURFACE WATER AMBIENT MONITORING PROGRAM

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## Executive Summary

Bioaccumulation of multiple contaminants is negatively impacting the beneficial uses of many water bodies in California by making fish and shellfish unsafe for human and wildlife consumption. California's bioaccumulation problem has a strong connection to environmental justice, as many disadvantaged communities depend most heavily on consumption of fish and shellfish from California water bodies, often in relatively contaminated locations, and as a result face disproportionately high contaminant exposure and health risks. Bioaccumulation monitoring is crucial in identifying the extent of impairment in California, identifying and prioritizing management actions, tracking whether impairment is being reduced in response to management, and informing the public on how to minimize health risks related to consumption of wild-caught fish.

Since 2007 the [Bioaccumulation Monitoring Program](#) (Program), a component of the California State Water Resources Control Board's Surface Water Ambient Monitoring Program, has been the primary source of information in California to meet these needs. The design of the Program evolved over the years in response to changing information needs and fluctuations in funding. Beginning in 2021, the Program initiated a Realignment process - a new direction with the goal of working with communities within Water Board Regions to fill data, information, and communication gaps and to characterize the exposure of communities that rely most heavily on fishing for consumption, subsistence, sustenance, and cultural purposes. The Realignment process has been a robust and notable environmental justice project, driven by engaging with communities to select the locations, species, and analytes to monitor.

In 2024 the Program completed a second round of statewide monitoring and reached a point where priorities and long-term plans needed to be established for the next phase of Program monitoring. In 2023 and 2024, the Program facilitated [Safe to Eat Workgroup](#) (STEW) participants through a thoughtful and deliberate process to determine those priorities and plans. This report documents that process and its outcomes.

The mission of the Program has been to provide statewide monitoring data and information that is used to:

1. assess and contribute to the protection and restoration of fishing and aquatic life beneficial uses that are impacted by the bioaccumulation of pollutants in California's waterbodies, and

2. assess the human health risks associated with the consumption of contaminated fish and shellfish in California's freshwater and coastal ecosystems and use that information to support the development of advisories that inform consumers of significant health risks associated with the consumption of particular species.

Overall, a total of 27 groups provided input on their priorities. Interest was roughly equally distributed across the three major water body types (lakes and reservoirs, coastal areas, rivers and streams). Fish was the primary species type of interest, but shellfish were a priority for about half of the respondents. Metals and PFAS were the top two contaminant priorities, but there was also significant interest in algal toxins, microplastics, PCBs, and organochlorine pesticides. The two major sticking points were lack of funding (cited by all respondents) and lack of information on consumption patterns, particularly for those who consume fish and shellfish for subsistence, tribal, or cultural reasons.

Given uncertainty surrounding future funding, SWAMP management directed the Program consider what could be accomplished under several funding scenarios. Four scenarios for future Program funding are presented. A description of the plan for the FY 24/25 funding level (\$650,000) is presented first ("Tier 2"), followed by consideration of designs at a reduced funding level (\$375,000) and two increased funding levels (\$1M per year and \$2M per year).

### **Tier 2: Current Funding (\$650,000 per year)**

This is the FY 24/25 funding level for the Program. The general distribution of the funds each year would be as follows:

- Realignment: \$200K for monitoring and honoraria for tribal and community participants
- SFEI: \$100K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors
- Moss Landing Marine Laboratories (MLML) and chemistry lab: \$350K for role in Program management plus sampling and analysis for statewide monitoring

This level of funding would allow the Realignment to continue at approximately the same level of effort as the last three years, although inflation would gradually reduce the amount of sampling and analysis that could occur over the next five years.

For statewide monitoring, \$350K per year to MLML and the chemistry lab would be enough to sample approximately 15 lakes, river stations, or coastal zones per year.

This level of effort is not sufficient to support a systematic sampling design across the hundreds of sampling locations of interest across the state. The best application of this level of funding to statewide monitoring is to sample locations with high priority data gaps.

### **Tier 1: Reduced Funding (\$375,000 per year)**

For a reduced funding scenario, options for a 50% decrease (i.e., \$375,000 per year) are considered. A starting point for the discussion is to assume that the priorities expressed in the \$650,000 plan would also apply, with a balance between Realignment monitoring and statewide monitoring. Based on these priorities, the budget could be distributed as follows.

- Realignment: \$150K for monitoring and honoraria for tribal and community participants
- SFEI: \$50K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors
- MLML and chemistry lab: \$175K for role in Program management plus sampling and analysis for statewide monitoring

Realignment is given a higher relative priority in this limited funding scenario (i.e., only reduced 25% rather than 50% like the other elements). This might be enough to keep the Realignment effort moving forward at a level that the community and tribal partners find satisfactory.

With \$175K for statewide monitoring it would only be possible to sample approximately seven or eight lakes, river stations, or coastal zones per year. At this level of funding, it would probably not be worth the effort required to coordinate and manage statewide monitoring. One way to have a better balance of sampling to management would be to perform the statewide sampling every other year or every third year. At this pace of sampling, only the very highest priority data gaps could be filled.

A significant drawback of less frequent sampling would be maintaining the engagement of the various people and organizations involved for such a low level of activity and impact, and with significant gaps between active periods. This level of monitoring activity would also fall far short of addressing the information needs of water quality and public health agencies to manage the significant impairments of beneficial uses and health risks in California due to bioaccumulation.

In a reduced funding scenario, it may be preferable to focus on funding one primary program element relatively well rather than two at insufficient levels. If the budgets for

Realignment and traditional monitoring are combined, \$325K could be applied to either Realignment, statewide monitoring, or a multi-year effort to conduct a statewide survey of fish consumption.

### **Tier 3: Moderate Funding Increase (\$1,000,000 per year)**

A moderate increase in funding for the Program would allow the Program to continue the level of statewide monitoring that was conducted from 2015-2023, covering about 30 locations per year, while continuing Realignment monitoring at the FY 24/25 level. To a large degree, this funding increase would allow the Program to keep up with the inflation that occurred from 2011 to 2024 while the budget for the Program remained essentially flat. A few options are described for how this level of funding could be used to address priority information needs:

- Option A: most of the increased funding would go to maintain statewide monitoring at the level achieved from 2015-2023
- Option B: would mostly go to accelerating the Realignment effort
- Option C would support a multi-year statewide consumption survey
- Option D would support a multi-year statewide survey of contaminants in shellfish

### **Tier 4: Robust Funding (\$2,000,000 per year)**

A more robust level of funding (e.g., \$2,000,000 per year or more) would be more commensurate with the legislatively mandated task of monitoring, managing, and communicating the substantial risks to humans and aquatic life from bioaccumulation in a state as large and diverse as California. Contaminant bioaccumulation is causing widespread and significant impairment of beneficial uses related to human and wildlife health in California. Information on bioaccumulation is needed to support impairment assessments, to track trends and short-term and long-term responses to management actions, to support implementation and assessment of Tribal Beneficial Uses throughout the state, and to support development and updating of fish consumption advisories so consumers can minimize their exposure and risk.

Bioaccumulation impact on fishing beneficial uses has a strong connection to environmental justice, which heightens data needs and calls for a more expensive but important approach to monitoring that includes strong community engagement, relationship building, and partnership. Data gaps continue to exist for legacy contaminants (mercury and PCBs), while data needs are growing due to the emergence of PFAS as a contaminant of significant concern and the need for surveillance for other emerging contaminants (e.g., microplastics) and algal toxins.

An approximate general distribution of the funds each year for Tier 4 could be as follows.

- Realignment: \$600K for monitoring, process facilitation, and honoraria for tribal and community participants
- SFEI: \$150K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors
- MLML and chemistry lab: \$1,000K for role in Program management plus sampling and analysis for statewide monitoring
- Contractors to-be-determined: \$250K for special studies on a variety of priority topics

This level of funding for Realignment could allow the Program to increase the pace of Realignment monitoring so that one region is monitored per year (instead of every three years). This would allow statewide coverage in a nine-year period, which is more in line with the importance and urgency of this environmental justice-related work. State Board staff time and third-party facilitation support would also need to be increased to support this accelerated effort.

\$1 million per year to MLML and the chemistry lab for statewide monitoring would be enough to bring the Program back to monitoring approximately 40 water bodies per year as was done in the bass lake monitoring effort from 2015-2023.

The funding for special studies could be applied over time to a series of high priority topics, including:

- a multi-year, statewide consumption survey;
- a multi-year, statewide shellfish survey;
- further development of open and interactive data resources for all fishers;
- monitoring of bioaccumulation impacts on aquatic life;
- monitoring of contaminants of emerging concern (CECs); and
- evaluation of whole fish and fish body parts.

The \$250,000 per year allocated for special studies in Tier 4 would allow for gradual progress to be made on this list of topics, but it would likely take 10-15 years to make significant progress. While a Program budget of \$2 million per year would be a large improvement over the current funding level, it is still not adequate to address, in a timely manner, the many urgent data, information, communication, and meaningful tribal and community engagement needs related to the bioaccumulation problem in California.



# The Need for Robust and Comprehensive Bioaccumulation Monitoring in California

Bioaccumulation of multiple contaminants is negatively impacting the beneficial uses of many water bodies in California by making fish and shellfish unsafe for human and wildlife consumption. The [2024 California Integrated Report](#) (Clean Water Act Section 303(d) List and 305(b) Report) assessed over 19,000 water bodies for bioaccumulation-related beneficial uses and resulted in 51 water body-pollutant combinations being added to the 303(d) list of impaired waters due to elevated concentrations of mercury, PCBs, legacy pesticides, selenium, and other bioaccumulative contaminants. Only three water bodies were identified as Category 1, which means that none of the beneficial uses assessed were impaired. Mercury bioaccumulation is the most pervasive problem, and prompted a special [statewide mercury program](#) that set mercury limits to protect the beneficial uses associated with the consumption of fish by both people and wildlife, established three new beneficial use definitions for use by the State and Regional Water Boards (Tribal Traditional Culture, Tribal Subsistence Fishing, and Subsistence Fishing), and initiated an effort to develop a statewide control program for reservoirs. California's bioaccumulation problem has a strong connection to environmental justice, as many disadvantaged communities depend most heavily on consumption of fish from California water bodies, often in relatively contaminated locations, and as a result face disproportionately high contaminant exposure and health risks.

Contaminant bioaccumulation has also prompted the California Office of Environmental Health Hazard (OEHHA) assessment to issue more than 150 [fish consumption advisories](#) for California water bodies. Most of these are for specific water bodies, but the bioaccumulation is so pervasive that OEHHA has also issued statewide advisories for California water bodies without specific advice, including lakes and reservoirs; coastal locations; rivers, streams, and creeks; and for fish species that migrate. The statewide advisories recommend that the sensitive population (women age 18-49 and children 1-17) should not eat any amount of several fish species.

Bioaccumulation monitoring is crucial in identifying the extent of impairment in California, identifying and prioritizing management actions, tracking whether impairment is being reduced in response to management, and informing the public on how to minimize health risks related to consumption of wild-caught fish.

Since 2007 the [Bioaccumulation Monitoring Program](#) (Program), a component of the California State Water Resources Control Board's Surface Water Ambient Monitoring Program, has been the primary source of information in California to meet these needs. In 2024 the Program completed a second round of statewide monitoring and has

reached a point where priorities and long-term plans need to be established for the next phase of Program monitoring. In 2023 and 2024, the Program facilitated [Safe to Eat Workgroup](#) (STEW) participants through a thoughtful and deliberate process to determine those priorities and plans. This report documents that process and its outcomes.

## Statewide Bioaccumulation Monitoring in California To Date

The mission of the Program is to provide statewide monitoring data and information that is used to:

1. assess and contribute to the protection and restoration of fishing and aquatic life beneficial uses that are impacted by the bioaccumulation of pollutants in California's waterbodies, and
2. assess the human health risks associated with the consumption of contaminated fish and shellfish in California's freshwater and coastal ecosystems, and use that information to support the development of advisories that inform consumers of significant health risks associated with the consumption of particular species.

The design of the Program has evolved as it has responded to information needs and fluctuations in funding. The first five years of the Program focused on addressing the lack of systematic statewide assessment of bioaccumulation in sport fish. A relatively high level of funding at the beginning of the Program allowed it to perform robust statewide monitoring. The Program began with a quite extensive statewide survey of lakes and reservoirs in 2007 and 2008. In these two years, fish were collected from 272 lakes and analyzed for mercury, PCBs, dieldrin, DDTs, chlordanes, and selenium. The effort included a random sampling of 50 lakes to obtain an unbiased estimate of average condition, and targeted sampling of 222 lakes considered to be high priority locations for assessing bioaccumulation. This was followed in 2009 and 2010 by a survey of the same list of contaminants in fish from 68 coastal zones, and then a similar survey in 2011 of 63 river and stream locations.

Funding for the Program after these initial statewide surveys levelled off at approximately \$500,000 per year from 2012 through 2024 ([Figure 1](#)). The statewide surveys were followed by several years with a focus on special studies: a two-year statewide study of mercury accumulation and risks in grebes in 25 lakes in 2012 and 2013, a one-year study in 2014 of 23 lakes with relatively low concentrations of mercury

in fish to confirm the low levels and to try to identify factors associated with them, and a one-year effort in 2016 to sample 37 lakes that were identified as having data gaps.

Sampling from 2015 through 2024 focused on revisiting high priority locations to provide up-to-date information on contamination status and begin to build a dataset on long-term trends. A multi-year plan for sampling lakes with black bass was initiated in 2015. For this effort a set of 190 high priority lakes was identified based on input from the Regional Boards. To fit within the available budget, these lakes were divided into five subsets, with 36 lakes sampled every second year from 2015 through 2023. A second survey of the coast was initiated in 2018. This survey was spread over three years (2018, 2020, and 2024) to fit within the available budget and logistical limitations imposed during the COVID-19 pandemic.

Beginning in 2021, \$200,000 per year of the Program budgets were allocated to support the [Realignment Process](#) – a new direction for the Program with the goal of working with communities within Water Board Regions to fill data, information, and communication gaps and to characterize the exposure of communities that rely most heavily on fishing for consumption, subsistence, sustenance, and cultural purposes. The Realignment Process is based on engaging with these communities to build relationships, get a better understanding of data and information needs, and select the locations, species, and analytes to monitor. Given funding and staffing constraints, this work is being done one Water Board Region at a time, with three years spent per region: engagement and study design in year 1, monitoring in year 2, and reporting in year 3. The Realignment Process began with the San Diego Region in 2021 and was initiated for the San Francisco Bay Region in 2024.

With the completion of the 10-year bass lake effort in 2023 and the second round of coastal monitoring in 2024, the Program reached a point where there was a need to decide on a plan for the next phase of the Program for 2025 and beyond, in a manner that makes optimal use of the limited funding available to address information needs in relation to management of the state's bioaccumulation problem, and to support the protection and restoration of water quality to support all beneficial uses throughout the state.

# Program Planning for 2025 - 2029

## Planning Process

The Program, through the STEW, initiated a "Long-term Monitoring Priorities Assessment Process" to develop a workplan for 2025 and beyond, beginning at the November 2022 STEW meeting. This very deliberate and thoughtful process was designed to gather input on bioaccumulation information needs from an array of state, federal, and local agencies, Tribal governments, and communities that are responsible for managing or are affected by California's bioaccumulation problem ([Table 1](#)). Extensive efforts were made to reach out to groups that were thought likely to be interested. These groups were asked to begin considering their information needs in early 2023 in preparation for a formal process of sharing and discussing them in late 2023 and early 2024.

The groups were asked to consider the following two main questions:

- What are your priorities over the coming years and how could the Program and STEW support?
- How can we most effectively use our SWAMP Bioaccumulation Monitoring Program funds and leverage other monitoring efforts and partnerships?

The desired outcomes of the process were to:

- get a better understanding of the long-term (5-10 years) monitoring and analysis needs and priorities of the bioaccumulation monitoring partners and larger community;
- make general plans for statewide SWAMP Bioaccumulation Monitoring over the next 5 years;
- make more specific plans for statewide SWAMP Bioaccumulation Monitoring for 2025 and 2026; and
- support the need for more advanced timelines for permitting process.

Two main written tools were used to obtain input. The first tool was a written template for [Regional Water Boards](#) or [External Partners](#) (i.e., Tribes, Agencies, or Community-Based Organizations). Groups interested in participating in the Long-term Monitoring Priorities Assessment Process were asked to fill in components of the template; Regional Boards were required to complete everything, and others could complete only those components that applied to them.

The template asked for information on the following items:

- contacts within their organization;
- recent monitoring conducted by that group;
- anticipated future monitoring that would be conducted by that group;
- monitoring wish list;
- Program sticking points; and
- additional information or resources.

The second written tool was a Google form. The Google form was intended to be used by those that may not have the interest, time, or capacity to complete template, but still wanted to provide feedback and participate in the process. The form asked respondents about their priorities for:

- water body types;
- specific water bodies;
- type of species (fish, shellfish, other);
- specific species; and
- contaminants.

In addition to providing this written input, the groups with active participation were asked to give presentations to the STEW on their priorities. A special series of five extra STEW meetings (in addition to the usual quarterly meetings) was held for these discussions. The special meetings were held from November 2023 through March 2024. Presentations were made by the nine Regional Boards, the State Water Board (Division of Water Quality), OEHHA, the California Department of Public Health (CDPH), and the San Francisco Bay, Southern California Bight, and Delta regional monitoring programs.

The links to relevant STEW meeting slides, notes and recordings are listed in [Appendix 1](#). Links to completed templates provided by presenters are provided in the meeting notes associated with each respective item.

Overall, a total of 27 groups provided input on their priorities ([Table 1](#)). A high-level summary of priorities across all these groups is shown in [Table 2](#). Interest was roughly equally distributed across the three major water body types (lakes and reservoirs, coastal areas, rivers and streams). Fish was the primary species type of interest, but shellfish were a priority for about half of the respondents. Metals and PFAS were the top two contaminant priorities, but there was also significant interest in algal toxins, microplastics, PCBs, and organochlorine pesticides. The two major sticking points were

lack of funding (cited by all respondents) and lack of information on consumption patterns.

Input from three partner agencies with a statewide perspective on bioaccumulation information needs are particularly noteworthy. The Standards and Assessment Section of the State Water Board's Division of Water Quality (DWQ) identified the following priorities in their presentation to the STEW on January 24, 2024.

1. Continue to sample waters with known bioaccumulation problems if there are control actions that might change conditions. Prioritize those sites where more people are likely to consume fish or shellfish.
2. Sample waters where we have some indication there is a bioaccumulation problem but not enough data to conclude if there is or is not a problem. Use the 303(d) Category 3 list (also known as the "Watch List") to identify waters with monitoring data gaps.
3. Support OEHHA fish consumption advisories. Ask OEHHA if there are waters for which a few more samples might provide enough data to determine if an advisory is necessary or to develop an advisory.
4. Sample waters that we have not monitored yet but where people are consuming fish or shellfish, especially if underserved or tribal communities, and consuming at subsistence level.
5. Continue sampling rivers and streams where people are eating resident fish species with greater bioaccumulation rates. For example, it's not as critical to sample rivers where people eat salmon, but more critical where bass are caught and consumed.
6. Compile documentation demonstrating that people are eating fish in waterbodies not currently assigned the Commercial and Sportfishing (COMM) beneficial use.

OEHHA, in addition to identifying many specific needs for particular water bodies, species, and contaminants, recommended the following two priorities as important for long-term monitoring statewide.

1. Collection and analysis of contaminants in shellfish that are consumed by humans from freshwater, estuarine, and marine waters.
2. Analysis of PFAS in both fish and shellfish.

CDPH made the following recommendations for statewide monitoring, based largely on their studies of consumption by Asian communities as part of their [Biomonitoring California](#) Program.

1. Measure levels of mercury and PFAS in paired fillet/whole fish samples and/or individual fish parts. Focus on salmon, often promoted as a low-contaminant fish and highly consumed by ACE participants.
2. Archive whole fish, heads, skin, and/or organs for future testing for mercury and PFAS.
3. Measure levels of mercury and PFAS in crab and other shellfish, which were highly consumed by ACE participants.

After the last special STEW meeting on this topic in March 2024, the information was presented to SWAMP management for them to make final decisions on priorities. These decisions were then reported back to the STEW at their April 2024 meeting.

## **Outcomes of the Planning Process**

Based on the input received during the long-term planning process, SWAMP management provided the following direction to the Program and STEW in April 2024.

- Opportunities for feedback and identifying specific monitoring and analysis requests will continue to be supported by the Program through the annual monitoring plan development, review, and feedback process.
- Bioaccumulation monitoring needs will continue to change and there is the expectation from SWAMP management that the Program will reassess priorities and revisit long-term monitoring plans on a five-year cycle. The plan resulting from the 2023-2024 planning process can be adapted as information needs and resources evolve.
- Given the current budget (as of March 2024), Realignment monitoring will continue at its present funding level (\$200,000 per year) and pace. After the effort currently underway in Region 2 (2024-2026), the Realignment process will begin in a third region that has not yet been selected.
- For the next five years the Program will focus on filling gaps and priorities identified during the planning process and addressing specific equity and management questions, rather than on sampling with a statewide or probabilistic design.

- Data gaps for lakes and reservoirs will be monitored in 2025 and 2026, followed by rivers and streams in 2027, and the coast in 2028 and 2029 (Figure 2). Focusing on lakes and reservoirs first aligns well logistically with existing contracts. Monitoring rivers and streams in 2027 will give the Regional Boards time to determine whether and how they would like to augment that effort. Coastal monitoring will focus on data gaps in the Southern California Bight in 2028 to allow alignment with the Bight Program. Monitoring in 2029 will cover the rest of the coast (i.e., the Central and North Coast regions).
- Monitoring for trends and to update older data can be included based on specific requests shared by STEW partners during annual feedback process, as budget allows.
- The Program should consider reducing the emphasis on mercury, and only analyze for mercury for water bodies and species where OEHHA or the DWQ indicate more samples are needed for advisories or listing decisions, or STEW partners explicitly request it during the annual feedback process to address data gaps.
- The plan that is in development for analyzing PFAS in archived samples should be implemented. In addition, PFAS should be analyzed in water bodies that are close to known PFAS sources (e.g., industrial complexes and airports). More extensive statewide PFAS monitoring will be considered after completion of the archive study.
- Statewide designs and trend monitoring will be reconsidered after interpretive reports on the 10-year bass lake study and the second round of coast monitoring are completed (in 2025 and 2026, respectively).

SWAMP management directed the Program to develop a plan for 2025-2029 based on these considerations and the current understanding of anticipated funding (i.e., \$650,000 per year for the next five years). In addition, the Program was directed to consider what could be accomplished under other funding scenarios, including reduced funding and increased funding.



## Program Design Options for Different Funding Tiers

Uncertainty and limitations regarding the annual availability of funding are among the primary challenges facing the Program. SWAMP management directed the Program to consider what could be accomplished under several funding scenarios, including reduced funding and increased funding.

Funding for the Program in the first few years of the Program (FY 06/07 through FY 10/11) fluctuated from year to year. In the first two years \$2.1 million was allocated to cover the extensive lakes survey. Funding for the next three years averaged about \$750,000 per year. From FY 11/12 through the current fiscal year (FY 24/25) the annual allocations ranged between \$450,000 and \$650,000 ([Figure 1](#)). Beginning in FY 21/22, \$650,000 was allocated annually to the Program, with \$200,000 going to the Realignment effort.

Given the uncertainty surrounding future funding, SWAMP management directed the Program leads to develop a series of monitoring design options for different funding levels, including a scenario where Program funding is reduced below the current level.

This approach is similar to what was done for a previous report on recommendations for SWAMP bioaccumulation monitoring that was prepared in the early years of the Program (Davis 2008). The Davis (2008) report provides useful context for the present consideration of funding and design options for 2025 and beyond. The 2008 report described three tiers of funding.

- **Tier 1 was \$500,000 per year**, which was considered a low level of funding in 2008, especially given the much larger scope of the program during the initial lakes survey in 2007 and 2008 (\$2.1 million over two years, allowing monitoring of 272 lakes for the full suite of contaminants - mercury, PCBs, organochlorine pesticides, and selenium). In 2008, \$500,000 (\$750,000 in 2023 dollars) was considered enough to sample 40 targeted sites per year.
- **Tier 2 was \$1.5M per year** (\$2.25M in 2023 dollars). Funding at this level was considered sufficient to cover the 40 targeted sites from Tier 1, plus a series of other suggested elements: more intensive monitoring in a region, statewide random sampling (which had been a component of the 2007-2008 lakes survey), prey fish monitoring and bird egg monitoring to assess status and trends in regard to wildlife, and additional special studies.
- **Tier 3 was \$3.3M per year** (\$5M in 2023 dollars). This level was described as being "commensurate with the task of monitoring and reducing risks from bioaccumulation in a state as large and diverse as California." Tier 3 included

increased scopes of the elements of Tier 2 with the additions of shellfish monitoring and a major environmental justice-oriented component that would integrate monitoring with advisory development and risk communication and include the funded participation of representatives of affected communities. The vision was that stepwise region-by-region effort would develop consumption advice with complete coverage of the State in a 10-year period, along with risk communication efforts integrated into the program that could reduce human health risks significantly in a 10-year period without necessarily reducing fishing or fish consumption (through directing anglers to less contaminated fish species and locations). This concept was similar to the Realignment effort that the Program is currently implementing.

The Tier 1 funding level is what actually was approximately available from 2012-2024, ranging from \$450,000 to \$650,000 per year ([Figure 1](#)). The number of sites that could be sampled each year over this period gradually decreased due to inflation - \$650K in 2023 dollars would have been \$460K in 2012. The Realignment effort was initiated in 2021, which reduced the funds available for statewide monitoring. From 2015 through 2023 the Program was able to sample approximately 35 lakes per year to complete statewide, systematic, "long-term" bass lakes monitoring effort that began in 2015 (with five rounds of sampling over a 10-year period). However, with inflation and Realignment, 35 lakes or stations per year is not sustainable at the current funding level. At present, the funding projected for the next five years is sufficient to cover Realignment sampling plus approximately 15 water bodies (lakes, river stations, or coastal zones) for statewide sampling per year.

Four scenarios for future Program funding are presented here. A description of the plan for the current funding level (\$650,000) is presented first ("Tier 2"), followed by consideration of designs at a reduced funding level (\$375,000) and two increased funding levels (\$1M per year and \$2M per year).

## **Tier 2: Current Funding (\$650,000 per year)**

This is the current funding level for the Program. The general distribution of the funds each year would be as follows.

- Realignment: \$200K for monitoring and honoraria for tribal and community participants
- SFEI: \$100K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors

- Moss Landing Marine Laboratories (MLML) and chemistry lab: \$350K for role in Program management plus sampling and analysis for statewide monitoring

This level of funding would allow the Realignment to continue at approximately the same level of effort as the last three years, although inflation would gradually reduce the amount of sampling that occurs over the next five years.

For statewide monitoring, \$350K per year to MLML and the chemistry lab would be enough to sample approximately 15 lakes, river stations, or coastal zones per year. This level of effort is not sufficient to support a systematic sampling design across the hundreds of sampling locations of interest across the state. The best application of this level of funding to statewide monitoring is to sample locations with high priority data gaps.

Thoughtful prioritization will be key to maximizing the value of all of the designs presented in this report, but even more important for lower levels of funding. As part of the planning process, survey participants provided input on specific water bodies that they consider to be high priorities for sampling ([Feedback Synthesis Table](#)). The highest priority subset of these water bodies should be sampled.

Coordination with other monitoring programs would be another way to maximize and expand the monitoring performed for both Realignment and statewide monitoring. The Realignment effort in the San Francisco Bay Region (Region 2) in 2024 focused on gathering and documenting information on monitoring priorities of communities and tribes. The [Regional Monitoring Program for Water Quality in San Francisco Bay](#) (Bay RMP) is conducting Bay-wide fish monitoring in 2024 and is monitoring one of the locations (Hunters Point) identified through the Realignment discussions. In addition, in 2025 the Bay RMP will begin a new program element to monitor in partnership with communities, with community members collecting fish. This work is intended to complement and expand on the priorities identified in the Region 2 Realignment Monitoring Plan.

For the rivers sampling in 2027, the [Delta Regional Monitoring Program](#) (Delta RMP) has expressed interest in coordinated sampling of stations in the Delta. This collaboration would allow the Program to have greater overall coverage of river stations, including Delta stations, that have exhibited some of the highest mercury concentrations observed in the state. The Delta RMP would benefit from not having to pay for project management, QA, data management, and reporting.

Since its beginning the Program has collaborated with the [Southern California Bight Regional Monitoring Program](#) (Bight Program) for monitoring 27 zones that span the Bight. The Bight Program contributes substantial resources toward chemical analysis of

the samples and led reporting for the 2018 effort. With \$350,000 per year for statewide monitoring, however, sampling the Bight would take approximately the entire two-year allotment of Program funding for the coast in 2028 and 2029. The Program would need to decide whether to use this allotment to sample the 27 Bight zones or to reduce the effort in the Bight to allow inclusion of zones in the North and Central Coast regions.

If funding for statewide monitoring is lower than the Tier 2 amount, a point will be reached where the value of the information generated does not outweigh the effort that goes into planning, coordinating, managing, providing QA, managing data, reporting, and peer-reviewing. The \$350,000 funding level, with sampling of approximately 15 locations per year, is quickly approaching that point.

If the Regions are able to contribute funds to augment the statewide monitoring that would help to improve the ratio of information generated relative to project management.

Given the limited funding, another option suggested in the planning process was to drop the Realignment effort and apply those funds toward statewide monitoring until the funding situation improves. However, SWAMP Management has made clear that doing so is unlikely.

### **Tier 1: Reduced Funding (\$375,000 per year)**

For a reduced funding scenario, options for a 50% decrease (i.e., \$375,000 per year) are considered. A starting point for the discussion is to assume that the priorities expressed in the current \$650,000 plan would also apply, with a balance between Realignment monitoring and statewide monitoring. Based on these priorities, the budget could be distributed as follows.

- Realignment: \$150K for monitoring and honoraria for tribal and community participants
- SFEI: \$50K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors
- MLML and chemistry lab: \$175K for role in Program management plus sampling and analysis for statewide monitoring

The Realignment is given a higher relative priority in this limited funding scenario (i.e., only reduced 25% rather than 50% like the other elements). This may or may not be enough to keep the Realignment effort moving forward at a level that the community and tribal partners find satisfactory.

With \$175K for statewide monitoring it would only be possible to sample approximately seven or eight lakes, river stations, or coastal zones per year. At this level of annual sampling the value of the information generated would not be worth the investment of effort that would go into planning, coordinating, managing, providing quality assurance and data management, reporting, and peer-reviewing (these activities will be referred to collectively below as "management"). One way to have a better balance of sampling to management would be to perform the statewide sampling every other year or every third year. At this pace of sampling, only the very highest priority data gaps could be filled. A significant drawback of less frequent sampling would be maintaining the engagement of the various people and organizations involved for such a low level of activity and impact, and with significant gaps between active periods. At this level of funding, it would probably not be worth the effort required to coordinate and manage statewide monitoring. This level of monitoring activity would also fall far short of addressing the information needs of water quality and public health agencies to manage the significant impairments of beneficial uses and health risks in California due to bioaccumulation.

This low level of effort would also make it challenging to collaborate with and leverage the efforts of other monitoring programs. The possibility of coordinating with the Delta RMP on rivers sampling would have to be evaluated relative to other statewide priorities. Collaboration with the Bight Program as has been done in the past (i.e., covering 27 zones) would require three- or four-years' worth of the statewide monitoring funding allocation. Therefore, in this funding scenario, the number of zones would likely need to be pared back.

In a reduced funding scenario, it may be preferable to focus on funding one primary program element relatively well rather than two at insufficient levels. Options for this would include the following.

### ***Option 1A - \$325K for Realignment***

This would allow an increase in Realignment monitoring relative to what has been done or is being done in the San Diego and San Francisco Bay Regions, respectively. Since the Realignment work is geographically focused (i.e., one region at a time), this would support a robust sampling of areas of interest to communities and tribes. At the present rate of Realignment progress, however - three years per region - each region would only be sampled by the Program once every 27 years. With the increased funding for Realignment this rate could possibly be increased to two years per region, which would allow each region to be sampled once every 13-14 years. State Board staff time and support from third party facilitation would also need to be increased for coordinating the effort.

### ***Option 1B - \$325K for Statewide Monitoring***

This amount of funding would allow statewide monitoring to continue at a slightly reduced level compared to the current plan described under Tier 2. All the same considerations discussed for statewide monitoring in that section would apply for this scenario as well.

### ***Option 1C - \$325K for Consumption Surveys***

Information on fish consumption was identified as a priority need by eight of the nine regional Water Boards. This amount of funding could support a robust effort to plan and implement a project to collect consumption information across the state. Multiple years of funding at this level would be needed, but the funding would be adequate to address this high-priority, longstanding information gap. Ideally such a project would obtain information from both the general fishing population and tribal and subsistence fishers. Engaging, or, even better, partnering with community organizations and tribal governments would allow this work to be done in a manner that addresses environmental justice. The funding would primarily go to a contractor with expertise in conducting fish consumption surveys to lead and coordinate the overall effort.

### **Tier 3: Moderate Funding Increase (\$1,000,000 per year)**

A moderate increase in funding for the Program would allow the Program to continue the level of statewide monitoring that was conducted from 2015-2023, covering about 30 locations per year, while continuing Realignment monitoring at its current level. To a large degree, this funding increase would allow the Program to keep up with the inflation that has occurred over the last 14 years while the budget for the Program has remained essentially flat. A few options are described below for how this level of funding could be used to address priority information needs.

### ***Option 3A: Statewide Monitoring Focus***

This option basically continues the overall design that has been implemented since Realignment began in FY 21/22. The approximate general distribution of the funds each year for Option 3A would be as follows.

- Realignment: \$250K for monitoring and honoraria for tribal and community participants
- SFEI: \$100K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors

- MLML and chemistry lab: \$650K for role in Program management plus sampling and analysis for statewide monitoring

This option would continue the Realignment Process at approximately the same level of effort as the last three years, although inflation will gradually reduce the amount of sampling that occurs over the next five years. Additional funds could be shifted to the Realignment to allow that element to keep pace with inflation.

This option would allow the statewide monitoring element to catch up to some degree with the inflation that has occurred while the Program budget has been fixed over the last 14 years. \$700,000 per year would be enough to sample approximately 30 lakes, river stations, or coastal zones per year. This level of funding for statewide monitoring could support a multi-year statewide systematic sampling design for lakes, like the one implemented from 2015-2023 where 190 lakes were sampled across the state through five rounds of sampling (38 lakes per round). The lake sampling could continue to address data gaps identified by STEW partners, and with advance planning possibly include an element of randomization that would allow for tracking of statewide trends. Monitoring of the coast on a 10-year cycle could also continue, with a two- or three-year effort sufficient to cover the 65 zones sampled in two previous rounds. One or two years' worth of effort could also be allocated to a statewide sampling of priority river stations. The statewide monitoring could include targeted sampling of mercury, PCBs, and PFAS, and prey fish.

With this option, continued collaboration with the Bight Program would be similar to past collaborations in 2009 and 2018. The coordinated sampling effort could be completed in one year.

### ***Option 3B: Realignment Focus***

The approximate general distribution of the funds each year for Option 3B would be as follows.

- Realignment: \$500K for monitoring, facilitation support, and honoraria for tribal and community participants
- SFEI: \$100K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors
- MLML and chemistry lab: \$400K for role in Program management plus sampling and analysis for statewide monitoring

This would allow a major increase in Realignment monitoring relative to what has been done or is being done in the San Diego and San Francisco Bay Regions, respectively. Since the Realignment work is geographically focused (i.e., one region at a time), this would support a robust sampling of areas of interest to communities and tribes. At the present rate of Realignment progress, however - three years per region - each region would only be sampled by the Program once every 27 years. With the increased funding for Realignment this rate could possibly be increased to two regions every three years, which would allow each region to be sampled once every 13-14 years. The more than doubling of the funds going to Realignment (from \$200K to \$500K per year) would allow for more extensive monitoring each year and for keeping pace with inflation. State Board staff time and third-party facilitation support would also need to be increased for coordinating the effort.

Statewide monitoring would be increased by a limited amount to allow this element to keep pace with inflation. Aside from that, the same considerations described for Option 2 would apply to this option.

### ***Option 3C: Consumption Survey Focus***

The approximate general distribution of the funds each year for Option 3B would be as follows.

- Realignment: \$250K for monitoring and honoraria for tribal and community participants
- SFEI: \$100K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors
- MLML and chemistry lab: \$400K for role in Program management plus sampling and analysis for statewide monitoring
- Contractor: \$250K for a special project - a statewide consumption survey

This option would slightly increase the budgets for Realignment and statewide monitoring to allow them to continue at the current level of effort (i.e., the Option 2 level) and keep pace with inflation. This option would also include a significant additional element: a robust statewide project to plan and implement an effort to collect consumption information across the state.

Multiple years of funding at this level would be needed, but the funding would be adequate to address this high-priority, longstanding information gap. Ideally such a project would obtain information from both the general fishing population and tribal and



subsistence fishers. Engaging, or, even better, partnering with community organizations and tribal governments would allow this work to be done in a manner that addresses environmental justice. The funding would primarily go to a contractor with expertise in conducting fish consumption surveys to lead and coordinate the overall effort.

### ***Option 3D: Shellfish Focus***

The approximate general distribution of the funds each year for Option 3D would be as follows.

- Realignment: \$250K for monitoring and honoraria for tribal and community participants
- SFEI: \$100K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors
- MLML and chemistry lab: \$650K - \$400K for role in Program management plus sampling and analysis for statewide fish monitoring, and \$250K for adding statewide shellfish monitoring.

This option would slightly increase the budgets for Realignment and statewide monitoring to allow them to continue at the current level of effort (i.e., the Option 2 level) and keep pace with inflation. This option would also include a significant additional element: a robust statewide project to plan and implement an effort to conduct a statewide survey of contaminants in shellfish.

From the late 1970s through the 1990s, California conducted extensive statewide monitoring of contaminants in bivalves (reviewed by Melwani et al. [2013]). California initiated the State Mussel Watch Program (SMW) in 1977 to provide the State and Regional Boards with an indication of the spatial and interannual trends in selected toxic pollutants, principally heavy metals, PCBs, legacy pesticides, and PAHs, in the California coastal zone (Martin 1985). The SMW continued to conduct annual monitoring until 2003. The Program yielded a wealth of useful information on water quality in California (Stephenson et al. 1995, Davis et al. 2007, Tetra Tech 2008). Many instances of severe contamination were identified, leading to cleanup actions to reduce exposure of humans and wildlife. In addition, many relatively uncontaminated areas were identified. SMW documented the successful management of many pollutants that posed serious threats to wildlife and human health in the 1970s and 1980s. The SMW was instituted just in time to document the rapid improvements in water quality that resulted from bans on PCBs and legacy pesticides, reductions in metals due to wastewater treatment, and other improvements. The SMW was discontinued when

plans for the State Board's new statewide Surface Water Ambient Monitoring Program (SWAMP) for water quality began to take shape.

Statewide shellfish monitoring has not been conducted since the State Mussel Watch ended. This has been the case despite the long-recognized concern and need for understanding the impact of bioaccumulation in shellfish on beneficial uses. In 2006, SWAMP formed the STEW to develop plans for and to guide the implementation of SWAMP's statewide Bioaccumulation Monitoring Program. In 2009 the California Water Quality Monitoring Council designated the STEW as its workgroup for assessing the question: "Is it safe to eat fish and shellfish from our waters?" The stated mission of the STEW is "to assess the impacts of contaminants in fish and shellfish on beneficial uses in California water bodies through statewide monitoring." The STEW developed a Safe to Eat portal that is intended provide access to data and information on contaminants in fish and shellfish.

Despite being explicitly included in legislation that created the Program ([Assembly Bill No. 2872](#), 2000) and the mission of the Program and STEW, statewide shellfish bioaccumulation monitoring has not been conducted for over 20 years. Furthermore, even the monitoring that was done by the SMW prior to the Program was focused only on bivalves (not including other shellfish species) and not on characterizing human exposure (but rather on spatial and temporal trends in contamination). Both of the public health agencies that actively participate in the STEW have expressed strong interest in and need of information on contaminant bioaccumulation in shellfish. OEHHA recommended "contaminants in shellfish that are consumed by humans from freshwater, estuarine, and marine waters" as a priority for statewide monitoring, and recommended including PFAS in this monitoring. CDPH also identified a need for information on bioaccumulation in multiple types of shellfish, including clams, crab, crayfish, lobster, and mussels. Four regions, two tribes, and the Division of Water Quality also expressed a need for shellfish monitoring.

This option would include \$250K per year to support a statewide shellfish monitoring effort. With this level of funding, over the course of several years, a statewide assessment of bioaccumulation in shellfish could be obtained. Ideally, the effort would focus on locations and species with high consumption rates (i.e., popular shellfish gathering areas), and additionally examine areas that are anticipated to have high contaminant exposure (i.e., contaminated areas). Shellfish species in freshwater (crayfish and clams) and estuarine and marine waters (clams, mussels, oysters, crabs, and lobsters) should be included. Tissues that are popular for consumption (e.g., lobster tail) or that pose high risk (e.g., crab hepatopancreas) should be examined. The common bioaccumulative contaminants of concern (mercury, PCBs, and PFAS) should be included. Mercury would need to be analyzed as methylmercury because the fraction

of mercury present as methylmercury in shellfish tissue is variable. As with Program sport fish monitoring, one of the primary goals would be to generate the data OEHHA needs to include shellfish species in advisories. This would be a new element for the Program that would require a significant initial effort to develop a quality assurance project plan (QAPP) that articulates plans for sampling, analysis, quality assurance, and data management for shellfish monitoring and data management.

#### **Tier 4: Robust Funding (\$2,000,000 per year)**

A more robust level of funding (e.g., \$2,000,000 per year or more) would be more commensurate with the legislatively mandated task of monitoring, managing, and communicating the substantial risks to humans and aquatic life from bioaccumulation in a state as large and diverse as California. Contaminant bioaccumulation is causing widespread and significant impairment of beneficial uses related to human and wildlife health in California. Information on bioaccumulation is needed to support impairment assessments, to track trends and short-term and long-term responses to management actions, to support implementation and assessment of Tribal Beneficial Uses throughout the state, and to support development and updating of advisory information so consumers can minimize their exposure and risk. Bioaccumulation impact on fishing beneficial uses has a strong connection to environmental justice, which heightens data needs and calls for a more expensive but important approach to monitoring that includes strong community engagement and partnership. Data gaps continue to exist for legacy contaminants (mercury and PCBs), while data needs are growing due to the emergence of PFAS as a contaminant of significant concern and the need for surveillance for other emerging contaminants (e.g., microplastics) and algal toxins.

Tier 4 outlines a plan for how an annual budget of \$2 million could be used to address the most urgent bioaccumulation information needs.

An approximate general distribution of the funds each year for Tier 4 could be as follows.

- Realignment: \$600K for monitoring, facilitation support, and honoraria for tribal and community participants
- SFEI: \$150K for role in co-chairing STEW and lead scientist for the Program, honoraria for advisors
- MLML and chemistry lab: \$1,000K for role in Program management plus sampling and analysis for statewide monitoring

- Contractors to-be-determined: \$250K for special studies on a variety of priority topics

This level of funding for the Realignment could allow the Program to increase the pace of Realignment monitoring so that one Region is monitored per year. This would allow statewide coverage in a nine-year period, which is more in line with the importance and urgency of this environmental justice-related work. State Board staff time and third-party facilitation support would also need to be increased to support this accelerated effort.

The amount of funding for SFEI to lead this larger program and provide honoraria would need to be increased.

\$1 million per year to MLML and the chemistry lab for statewide monitoring would be enough to bring the Program back to monitoring approximately 40 water bodies per year as was done in the bass lake monitoring effort from 2015-2023.

The funding for special studies could be applied to a series of priority topics, some of which were described above, and are summarized again below.

- A coordinated, multi-year statewide effort to obtain consumption information (described under option [1C](#) and [3C](#)).
- A multi-year statewide shellfish monitoring survey, including PFAS (described under option [3D](#)).
- Further development of open and interactive data resources. Some work along these lines is already underway or planned. The [SWAMP Data Dashboard](#) was recently released and provides access to Program data. A plan for developing a fish harvest and consumption application for tribes and subsistence fishers is awaiting funding. Easy access to advisories and Program information via smartphones would greatly enhance the use of the information by fishers when they are out fishing.
- Monitoring of bioaccumulation impacts on aquatic life. A 25 lake Program statewide survey in 2012-2013 showed significant risks of mercury impact on reproduction of grebes, with 24% of the lakes having a high risk of impact (Ackerman et al. 2015). Other limited studies have found contaminants above thresholds for concern in marine mammals, including seals, sea lions, and sea otters (e.g., Kannan et al. 2006, Meng et al. 2009, Sedlak et al. 2017). No further monitoring of wildlife has been done by the Program since the grebe study.
- Monitoring of contaminants of emerging concern (CECs). The Program is just beginning to move (with PFAS work) beyond the list of legacy contaminants that

it has been monitoring since 2007, and that were monitored before that by earlier programs (Toxic Substances Monitoring Program, State Mussel Watch) since the 1970s. Even within the PFAS class, there is a need to move beyond analysis of legacy PFAS. Including monitoring of CECs in the Program would support a more proactive and effective approach to protection of beneficial uses related to bioaccumulation.

- Evaluation of whole fish and fish body parts. CDPH surveys have shown that fish consumers commonly eat more than just skinless fillets, including skin, heads, eyes, and organs. Consumption of whole fish is also a common practice. Studies to assess contaminant levels in whole fish and fish body parts would support exposure reduction through more detailed consumption advice.

This Tier 4 outline allocates \$250,000 per year for these special studies. This amount of funding would allow for gradual progress to be made on this list of topics, but it would likely take 10-15 years to make significant progress. While a Program budget of \$2 million per year would be a large improvement over the current funding level, it is still not adequate to address, in a timely manner, the many data, information, communication, and meaningful tribal and community engagement needs related to the bioaccumulation problem in California.

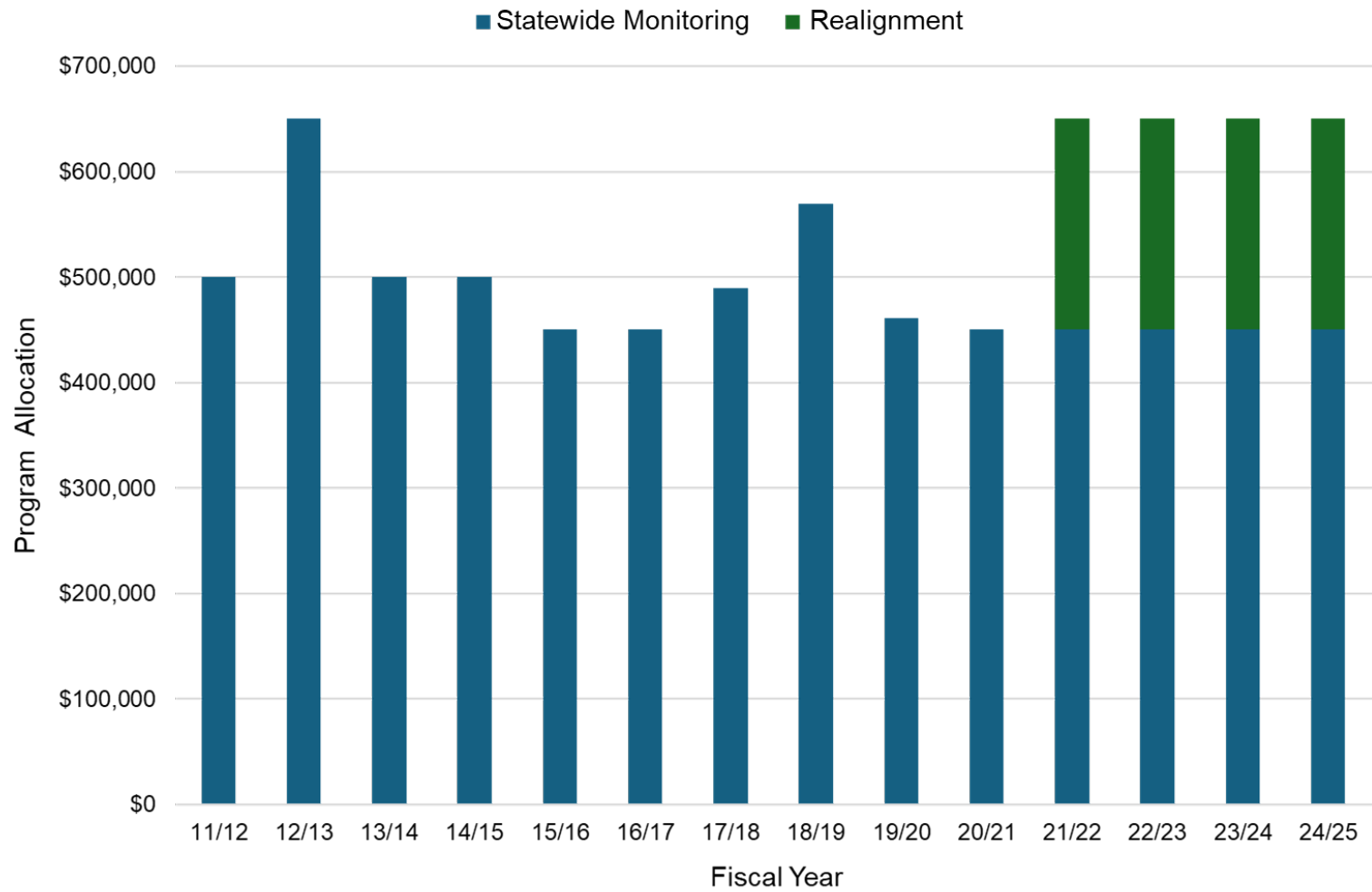
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# Figures

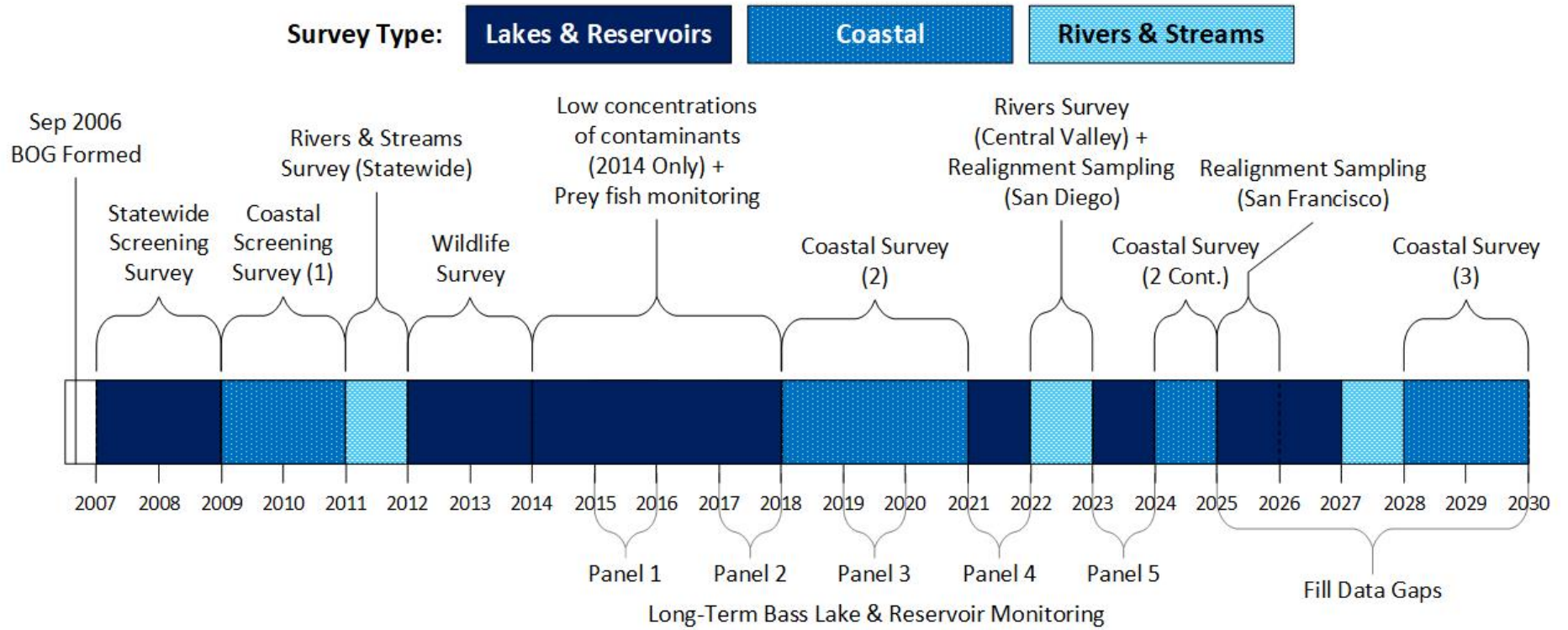
**Figure 1. Annual Program Funding Allocations.**

Program allocations from FY 2011/2012 through FY 2024/2025.



**Figure 2. Timeline of Program Monitoring.**

Actual elements shown for 2007 through 2024, planned elements for 2025 through 2029.





# Tables

**Table 1. Long-term Monitoring Priorities Assessment Process Participants**

<b>Participant Category</b>	<b>Participant Name</b>
California Water Boards	Nine Regional Water Quality Control Boards
	State Water Board Division of Water Quality
Other California State Agencies	California Office of Environmental Health Hazard (OEHHA)
	California Department of Public Health (DPH)
	California Department of Fish and Wildlife (CDFW)
Other Bioaccumulation Monitoring Programs	San Francisco Bay RMP
	Bight Program
	Delta RMP
California Native American Tribal Governments	Big Valley Band of Pomo Indians
	Habematolel Pomo Of Upper Lake
	Resighini Rancheria
	Tolowa Dee-ni' Nation
	Pinoleville Pomo Nation
Community Based Organizations	Concerned Citizens of Lake Arrowhead
	APA Family Support Services

**Table 2. Summary of Priorities from Long-term Monitoring Priorities Assessment Process Participants**

Percentage Legend: **Dark Purple** > 70%; **Dark Blue** = 50 - 70%; **Blue** = 25 - 49%; **Light Blue** < 25%

	Priority Recommendation Category	Percent of Participants that Identified Category as a Priority
<b>General Priority Recommendations</b>	<b><i>Water Body Types</i></b>	
	Lakes and Reservoirs	64%
	Coastal Areas	55%
	Rivers & Streams	64%
	<b><i>Species Types</i></b>	
	Fish	95%
	Shellfish	45%
	Other	14%
	<b><i>Contaminant Classes</i></b>	
	Algal Toxins / Cyanotoxins	55%
	Dioxins	18%
	Metals (Arsenic, Mercury, Selenium)	82%
	Microplastics	45%
	OC pesticides (e.g. DDT, dieldrin)	41%
	PBDEs	14%
	PCBs	41%
	PFAS	64%
	Other	9%

	Priority Recommendation Category	Percent of Participants that Identified Category as a Priority
<b>Sticking Points</b>  Percentages calculated for Regional Water Boards Responses Only	Lack of Funding	100%
	Lack of Staff	44%
	Lack of Time / Bandwidth / Capacity	22%
	Lack of Subject Matter Expertise	56%
	Lack of Info on Consumption Patterns (aka want a consumption survey)	89%
	Lack of coordination	22%
	Lack of outreach to affected communities	22%
	Time between monitoring & advisory development	11%
	Other	33%

# Appendices

## Appendix 1. Long-term Monitoring Priorities Assessment STEW Meetings.

Links to completed templates are provided in the meeting notes associated with each respective item.

Meeting Date	Key Agenda Items	Meeting Documents
Jan. 18, 2023	Item 6. Planning for 2024 Long-term Monitoring Priorities Assessment	<a href="#">Slides</a> (pg. 32 - 35) <a href="#">Notes</a> (pg. 7 - 8) <a href="#">Recording</a>
Oct. 18, 2023	Item 7. 2024 Long-term Monitoring Priorities Assessment Process	<a href="#">Slides</a> (pg. 72 - 82) <a href="#">Notes</a> (pg. 8 - 10) <a href="#">Recording</a>
Nov. 29, 2023	Item 2. Long-term Monitoring Priorities Assessment Process - Overview & Update Item 3. Long-term Monitoring Priorities Assessment Process - Q&A / Open Forum	<a href="#">Slides</a> <a href="#">Notes</a> <a href="#">Recording</a>
Dec. 20, 2023	Item 3. San Diego Regional Water Quality Control Board (Region 9) Monitoring Priorities Item 4. Los Angeles Regional Water Quality Control Board (Region 4) Monitoring Priorities Item 5. Lahontan Regional Water Quality Control Board (Region 6) Monitoring Priorities	<a href="#">Slides</a> <a href="#">Notes</a> <a href="#">Recording</a>
Jan. 24, 2024	Item 3. North Coast Regional Water Quality Control Board (Region 1) Monitoring Priorities Item 4. San Francisco Regional Water Quality Control Board (Region 2) Monitoring Priorities Item 6. Central Valley Regional Water Quality Control Board (Region 5) Monitoring Priorities Item 7. Colorado River Basin Regional Water Quality Control Board (Region 7) Monitoring Priorities Item 8. Santa Ana Regional Water Quality Control Board (Region 8) Monitoring Priorities Item 9. State Board Division of Water Quality (DWQ) Monitoring Priorities	<a href="#">Slides</a> <a href="#">Notes</a> <a href="#">Recording</a>

Meeting Date	Key Agenda Items	Meeting Documents
Jan. 31, 2024	Item 4. Office of Environmental Health Hazard Assessment (OEHHA) Monitoring Priorities	<a href="#">Slides</a> <a href="#">Notes</a> <a href="#">Recording</a>
Feb. 28, 2024	Item 3. Biomonitoring California Monitoring Priorities Item 4. Regional Monitoring Program for Water Quality in San Francisco Bay (Bay RMP) Monitoring Priorities Item 5. Southern California Bight Regional Monitoring Program (Bight RMP) Monitoring Priorities Item 6. Delta Regional Monitoring Program (Delta RMP) Monitoring Priorities Item 7. Central Coast Regional Water Quality Control Board (Region 3) Monitoring Priorities	<a href="#">Slides</a> <a href="#">Notes</a> <a href="#">Recording</a>
Mar. 27, 2024	Item 2. Long-term Monitoring Priorities Assessment Process - Overview & Update Item 3. Long-term Monitoring Priorities Assessment Process - Feedback Synthesis Item 4. Long-term Monitoring Priorities Assessment Process - Priority Discussion & Open Forum	<a href="#">Slides</a> <a href="#">Notes</a> <a href="#">Recording</a>
Apr. 24, 2024	Item 3: Long-term Monitoring Priorities Assessment Process - Decisions & Next Steps	<a href="#">Slides</a> (pg. 11 - 33) <a href="#">Notes</a> (pg. 4 - 6) <a href="#">Recording</a>