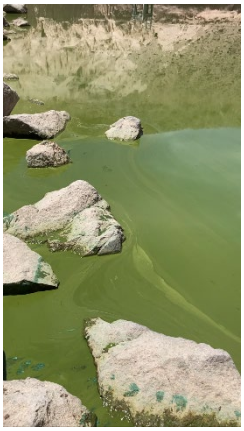
STATE OF CALIFORNIA | STATE WATER RESOURCES CONTROL BOARD



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Water Code Section 13182(a) Report

2023 ANNUAL REPORT

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Freshwater and Estuarine Harmful Algal Bloom Program

State Water Resources Control Board

Introduction

On September 27, 2019, the Governor approved Assembly Bill No. 834 (AB 834) requiring the State Water Resources Control Board (State Water Board) to establish a Freshwater and Estuarine Harmful Algal Bloom (FHAB) Program to protect water quality and public health from harmful algal blooms (HABs). As part of AB 834, the State Water Board FHAB Program is to consult with California Water Quality Monitoring Council (CWQMC), Office of Environmental Health Hazard Assessment (OEHHA), State Department of Public Health (CDPH), Department of Water Resources (DWR), Department of Fish and Wildlife (CA DFW), Department of Parks and Recreation, California Native American tribes, and other appropriate state and federal agencies. In response to AB 834, the fiscal year 2020/2021 budget act authorized five new staff positions to the Water Boards[1]. The staff positions were filled by June 2021 and were distributed among the State Water Board (two positions) and three Regional Water Quality Control Boards (one position each at Regional Water Boards 1, 5, and 6).

Background

AB 834 added requirements to California's Water Code, Section 13182(a):

On or before July 1, 2021, post on the State Board's internet website a report including the following information:

- *The incidence of, and response to, freshwater and estuarine harmful algal blooms in the state during the previous three years.*
- *Actions taken by the State Board including requirements pursuant to paragraphs (1) to (5)[2], inclusive.*
- *Recommendations, by the State Board and other entities participating in the Freshwater and Estuarine Harmful Algal Bloom Program, for additional actions, including preventative actions where possible, that should be taken to protect water quality and public health from harmful algal blooms, including recommendations for statutory or regulatory changes that are needed to achieve that goal.*

In accordance with the above requirements, the State Water Board posted the 2021 Legislative Report to the FHAB Program webpage in June 2021. The 2021 Legislative Report provided details as to how the Water Boards addressed HABs since the onset of

[1] Water Boards is used to refer to the collective of the State Water Board and the nine Regional Water Quality Control Boards.

[2] (1) Coordinate immediate and long-term event incident response, including notification to state and local decisionmakers and the public regarding where harmful algal blooms are occurring, waters at risk of developing harmful algal blooms, and threats posed by harmful algal blooms.(2) Conduct and support field assessment and ambient monitoring to evaluate harmful algal bloom extent, status, and trends at the state, regional, watershed, and site-specific waterbody scales.(3) Determine the regions, watersheds, or waterbodies experiencing or at risk of experiencing harmful algal blooms to prioritize those regions, watersheds, or waterbodies for assessment, monitoring, remediation, and risk management.(4) Conduct applied research and develop tools for decision-support. (5) Provide outreach and education and maintain a centralized internet website for information and data related to harmful algal blooms.

informal and unfunded efforts began in 2016 to track and coordinate responses to HAB events. It also thoroughly outlined the different requirements of AB 834 and identified the Water Boards' actions, infrastructure, and partnerships to meet those requirements. Within the 2021 Legislative Report, the State Water Board also established a phased approach to future reporting of FHAB Program updates to the legislature: (1) 2022 Comprehensive Report which would detail one full fiscal year of work supported by the program funds and permanent staff and (2) subsequent annual program reports.

The 2022 Comprehensive Report provided information regarding:

- The incidence of freshwater and estuarine harmful algal blooms in the state during the previous four years, and
- Actions taken from June 2021 to October 2022 in meeting the requirements of Water Code Section 13182(a) 1 & 2, and
- Recommendations for additional actions that should be taken, and associated resource needs to protect water quality and public health (California Water Code Section 13182(a)3) as documented in a comprehensive programmatic gap assessment.

This 2023 Annual Report will further outline the efforts of the FHAB Program in 2023 and identify continued resource needs to wholly implement the program as AB 834 mandates.

Incidence of Freshwater and Estuarine Harmful Algal Blooms

The following section details "the incidence of freshwater and estuarine harmful algal blooms in the state during the previous three years" per Water Code, Section 13182(a).

Public Incident & Illness Reports

The number of Incident Reports of HABs voluntarily submitted to the Water Boards by the public per year has continuously increased since the Water Boards began tracking them in 2018. This can be partly contributed to a growth in public awareness of HABs and the expansion of partnerships with other agencies, non-profit organizations, and California tribal communities. Climate change and anthropogenic sources are additional drivers that have led to the increase of reports across the state. Table 1 below summarizes the number of HAB incident reports voluntarily submitted by the public and coordinating agencies to the Water Boards per year between 2018-2022.

Table 1. Number of voluntary incident reports submitted through an On-Line Report Form per year from 2018-2022

	2018	**2019**	**2020**	**2021**	**2022**
Total Reports	190	241	370	603	684

In 2018, the voluntary Interagency HAB-related Illness Workgroup (Illness Workgroup) was developed to investigate and track potential HAB-related illnesses in humans and animals throughout California. HAB-related illness reports are received through the on-line report form and from California Poison Control Services. The number of reports of potential HAB-related illnesses in humans and animals investigated by the Illness Workgroup have also increased between 2018-2022. Table 2 summarizes the number of all illness reports received through 2022.

Table 2. Number of all illness reports* received (includes dog, livestock, wildlife, fish, and humans)

	2018	2019	2020	2021	2022
Illness Reports Received	40	49	42	91	80

*Note: These numbers reflect illness reports initially received. A report may include multiple individuals.

Actions Taken by Water Boards

The following section includes actions taken by the Water Boards to implement the FHAB Program and comply with each of the Water Code Section 13182(a) requirements from October 2022 to current. The actions taken are discussed in the context of the continued resource needs as identified by the comprehensive gap assessment included in the 2022 Comprehensive Legislative Report.

Incident Response

Section 13182(a)(1) Requirement: Coordinate immediate and long-term event incident response, including notification to state and local decisionmakers and the public regarding where harmful algal blooms are occurring, waters at risk of developing harmful algal blooms, and threats posed by harmful algal blooms.

HABs Incident Response

Despite limited dedicated staff for the FHAB Program, the Water Boards continues to respond to HAB incident reports from across the state. There are five dedicated staff for this program, two FHAB Program managers at the State Water Board and three regional FHAB Coordinators located at Regional Water Boards 1, 5, and 6. The other six Regional Water Boards do not receive funding for this program, so they provide support to the program voluntarily as resources are available. This has resulted in inconsistent or delayed response to HABs due to competing priorities. Additionally, it continues to be challenging to build relationships and coordinate with counties (environmental and public health departments) and waterbody managers to monitor and respond to HABs across the state when dedicated staff are not assigned to all Regional Water Boards.

Similarly, the Central Valley Regional Board is the biggest region in the state and experiences recurring and long term HABs in many waterbodies with one dedicated

FHAB Coordinator to manage such a large region. This has led to triaging priorities and many unrealized opportunities for education and outreach and enlisting new partners. The Water Boards are also facing the challenge of increasing numbers of HABs incident reports each year. Despite these continued challenges and resource constraints, the Water Boards was able to mostly maintain a response time of two business days for each incident report as standard practice. Though, the response process to these incident reports is often partially implemented by program staff due to resource constraints requiring triaging of response actions (e.g. sample analysis, advisory posting).

The FHAB Program is allocated $750,000 annually to address the mandates for Assembly Bill 834. Approximately 55% of the annual program budget is dedicated to a laboratory contract to analyze samples to inform recreational advisories that populate the statewide FHAB Incident Reports Map (HAB Web Map). Samples must be analyzed in a laboratory to determine toxin concentrations, which informs risk to public health. These analyses are expensive and often cost over $1000.00 per sample. As such, the current allocated budget only allows for a small portion of samples to be analyzed for public safety as staff must prioritize analyses of samples to locations with higher threat to public health. With staff limiting sample collection to more populated recreational areas, localized areas are left unmonitored and at risk.

HABs Illness Response

Some incident reports received by the Water Boards are illness related. These come in from the on-line report forms and from the California Center of Poison Control Services. These reports are responded to by an interagency collaborative group of agencies including the Office of Environmental Health and Hazard Assessment (OEHHA), California Department of Fish and Wildlife (CA DFW), California Department of Public Health, and the State Water Board. The group investigates illnesses/death of wildlife, dogs, human, and cattle and reports to the Center of Disease Control's One Health Harmful Algal Bloom System (OHHABS). Currently only 16 states report to OHHABS. This Interagency HAB-related HAB Illness Workgroup, with a team consisting of only five members, operates completely voluntarily to investigate potential HAB-related illnesses across California.

HABs Data Systems and Notifications

The State Water Board has made significant strides in the efforts to modernize the FHAB Reporting System that provides 1) a public data entry for voluntarily reported blooms in California, 2) an internal FHAB management database for recording information about the bloom and investigative follow up, and 3) the HAB Web Map providing the bloom report, investigation findings, and any relevant advisory signage posted at the water body. Modernization includes more streamlined messaging in the on-line report form and functionality to include attachments, including photos, which assist in identification of blooms, although still without the ability to determine toxin concentrations, if any. The FHAB management database has undergone an entire

overhaul with the onset of the 2022 summer season. Updates, enhancements, and improvements are still ongoing to ensure streamlined information translation onto the HAB Web Map and for data management. The infrastructure supporting the HAB Web Map was enhanced to allow automated updates twice a day rather than manually once a day, allowing for better public transparency by displaying data in near-real time. The data is also publicly available on the California Open Data portal.

Advisory signage posting

Though the HAB web map publishes advisories when triggered by a standardized guidance, posting of HAB-related advisory signage at a waterbody is currently voluntary. There is no regulatory trigger to ensure advisory postings are on the ground at waterbodies with a confirmed HAB. In areas where there are regular voluntary advisory postings, the Water Boards FHAB Program staff have been receiving feedback from counties, waterbody managers, and stakeholders for months to years.

In previous years on the Russian River, the county has posted HAB signage at all beaches managed by the county when they receive information that a bloom is present at one part of the river system. This conservative approach of posting all beaches for the recreation season was used by the county since they do not have the resources to monitor to inform appropriate public health advisories at all county managed beaches. This type of posting may lead to sign fatigue by the public and potentially over posting when there wasn't a health risk. Long-term impacts include loss of trust by the local population and tourists. This is a similar issue at Lake Tahoe where one monitoring event at a public beach triggered an advisory posting, but because of a lack of city resources to continue monitoring, the signage stays up indefinitely, even when the risk has dissipated. In other cases, waterbody managers and counties chose not to post advisory signage based on Water Boards recommendation due to lack of personnel resources. Because staff are not funded through a fee program, there are no resources to physically go out to a waterbody to post. These inconsistent approaches to posting relevant advisories promote distrust by not conveying accurate information about public health risks and can increase the risk of exposure to HABs when recreating and fishing in waterways statewide. Inconsistent posting is a product of a lack of dedicated resources for these agencies and associated regulatory triggers to enforce posting on the ground.

Monitoring and Assessment

Section 13182(a)(2) Requirement: Conduct and support field assessment and ambient monitoring to evaluate harmful algal bloom extent, status, and trends at the state, regional, watershed, and site-specific waterbody scales.

FHAB Monitoring Strategy Implementation Status

In early 2021, SWAMP funded and closely collaborated with the Southern California Coastal Water Research Project (SCCWRP) to release the report, *California Water*

Boards' Framework and Strategy for Freshwater Harmful Algal Bloom Monitoring[3] (hereafter, FHAB Monitoring Strategy). This document lays the foundation for how to develop an ambient monitoring program for freshwater and estuarine HABs in California, a priority that was identified in SWAMP's 2016 FHABs Assessment and Support Strategy. A key strength of the FHAB Monitoring Strategy is its reliance on multiple approaches to collecting ambient FHAB monitoring data to inform management decisions that ultimately lead to better protections for public health and the environment. Specifically, the strategy integrates: a) a partner program that provides infrastructure to encourage FHAB monitoring by other federal, state and local agencies, tribal governments, citizen science groups, etc., b) field surveys developed and managed by SWAMP or its partners, and c) remote sensing approaches that build upon the current partnership that California has formed with federal agencies. Additionally, incident response will continue and will be strengthened via synergies with ambient monitoring approaches.

Meanwhile, the FHAB Monitoring Strategy relies on data management, data visualization, and decision support systems as a core part of the monitoring infrastructure necessary for managers to effectively use FHAB data for management decisions and timely communication to the public. These assessments would inform management decisions, regulatory measures (amend existing permits), forecasting tools, and mitigation actions. The FHAB Program dedicated nearly 27% of the annual $750,000 budget to fund Regional Water Board special studies and partner monitoring programs in 2023. The State Water Board is also collaborating with existing Water Board programs including the Surface Water Ambient Monitoring Program bioassessment monitoring programs to leverage existing monitoring throughout the state. However, current resources are insufficient to implement statewide water monitoring at scales described in the objectives of AB 834.

Need for Water Quality Objectives for Cyanotoxins

Currently, there are no water quality objectives to address HABs. In February 2019, Assembly Bill 835 was not approved, which would have required the Water Boards, in consultation with other agencies, partners, and tribes, to develop minimum standards for HABs for the safety of recreational waterbodies. This bill has yet to be reinvigorated. The State Water Board's Division of Water Quality is in the process of developing policy to address biostimulatory conditions to be incorporated into Water Quality Control Plans and permits. However, it is still uncertain if water quality thresholds for cyanotoxins will be included in the provisions or a timeline for completion. Without water quality thresholds to evaluate the quality of surface waters across the state of California, it is challenging to assess and include monitoring requirements in permits and other regulatory measures.

[3] Smith, J., Sutula, M., Bouma-Gregson, K., & Van Dyke, M. (2021). *California Water Boards' Framework and Strategy for Freshwater Harmful Algal Bloom Monitoring: Full Report with Appendices* (SCCWRP Technical Report 1141.B). Southern California Coastal Water Research Project.

The Water Board's FHAB Program is currently collaborating with the State Water Board's Division of Water Quality in a formal consultation process with the OEHHA to re-evaluate their published 2012 suggested action levels for three cyanotoxins. These recommended action levels are over ten years old, and the state of the science has grown, so it is in the best interest of the state to evaluate the appropriateness of these action levels and investigate whether they should be updated, especially for human recreation uses. It is still unclear how the Water Board will be able to fund this work by OEHHA and how any updates to OEHHA's suggested action levels will be incorporated into Water Board regulatory programs. The State Water Board leads a subcommittee in the CCHAB[4] Network and will make recommendations to integrate the updated OEHHA action levels into the CCHAB Network's advisory framework, although response to HABs is voluntary and not regulatorily required.

The lack of regulations continues to cause fragmented local health department response to HAB events resulting in inconsistent advisory postings on the ground to inform the public that does not match the advisories published to the HAB Web Map. Also, the lack of regulatory measures has impaired the effectiveness of addressing AB 834 objectives including immediate and long-term event response to HAB events, statewide monitoring, as well as collecting data to inform management decisions to begin addressing the causes of HABs, reoccurring impacts, and mitigation efforts.

The FHAB Strategy is shelf ready for implementation, but water quality objectives and funding to incorporate into regulatory measures are necessary to trigger monitoring. The data obtained from regulatory measures would help the state to begin collecting the baseline data needed for many types of assessments and work towards management actions to mitigate HABs.

Annual Holiday Assessments

To protect Californians when water recreation is at the highest during the warm season and when HABs peak, the Water Boards and partner organizations perform pre-holiday assessments to monitor some of the more popular California lakes and rivers. The first year of three consecutive pre-holiday assessments started in May 2021 to proactively monitor popular recreational waterbodies prior to the Memorial, Independence, and Labor Day holiday weekends. Water quality conditions and relevant recreational advisories are shared through the HAB Web Map. For 2023, a similar program was performed and dedicated 20% of the FHAB Program's annual budget. However, approximately 30% fewer sites were sampled this year due to budgetary constraints. Laboratory costs increased with the execution of a new laboratory contract in December 2022. Regional Boards supplemented the laboratory contract and a couple Regional Boards performed additional pre-holiday assessments with their funding contributions. Overall, approximately 70 sites were sampled for pre-Memorial Day, 80 sites sampled for pre-Fourth of July, and 120 sites sampled for pre-Labor Day. The FHAB Program is

[4] California Cyanobacteria and Harmful Algal Bloom (CCHAB) Network, webpage at: California Water Quality Monitoring Council (SB 1070)

grateful for the Regional Boards supplementing the FHAB laboratory contract, although with often changing regional priorities, this approach is not assured for future contracts.

Availability of Data

The FHAB Program is also working towards uploading the data collected for incident response, holiday assessments, special studies, and partner monitoring into the California Environmental Data Exchange Network (CEDEN). This ensures this data is readily available to agencies, researchers, and the public for evaluation as part of the Integrated Report process for evaluating impairments in California's waters. This effort has not always been prioritized in previous years due to a lack of staff resources to ensure this data submitted for inclusion in the CEDEN. Rather, staff resources have been prioritized for data entry to a separate database that is connected to the HAB Web Map. Therefore, there is backlogged data to comb through and upload, although it is still unclear how this data will be evaluated in future years of the Integrated Report that informs the 303(d) List of Impaired Waters due to lacking water quality objectives.

Additional Regional Monitoring Collaborations

Although the Water Boards FHAB Program stretches its funding to the best of its ability, there is no comprehensive HAB monitoring program across the state. The State Water Board FHAB Program staff participated as part of the planning committee for the Delta Science Council's November 2022 Delta HAB Workshop. The intent was to receive stakeholder and agency feedback in developing a Delta Harmful Algal Bloom Monitoring Strategy. Key discoveries that prevent developing an effective monitoring strategy include the following: data collection is not consistent, there are different monitoring needs with different management questions which makes the data not comparable, data is stored in many different repositories making data sharing a challenge, and there is no dedicated funding to clearly understand the drivers of HABs in the Delta to inform appropriate management actions. This is a consistent issue across the state where data comes from a grant funded or limited term project, data is from existing monitoring stations that do not inform on HAB indicators, data is stored in different repositories, data is not comparable, or data is not collected to evaluate status or trends at a statewide level.

Risk Assessment

Section 13182(a)(3) Requirement: Determine the regions, watersheds, or waterbodies experiencing or at risk of experiencing harmful algal blooms to prioritize those regions, watersheds, or waterbodies for assessment, monitoring, remediation, and risk management.

To identify regions, watersheds, or waterbodies at risk, it is important to note the type of risk. There are a multitude of beneficial use risks including recreational, drinking water, agricultural, tribal, fish consumption, aquatic life, among others. To identify areas or waterbodies at risk of experiencing HABs, coordination within the Water Boards with the Division of Water Quality, Division of Drinking Water, Division of Water Rights and

outside the Water Boards with waterbody managers, Department of Water Resources, counties, researchers, tribes, and community groups, among others is necessary.

FHAB Program staff have assisted inter- and intra-agency staff when requested by providing technical support with the Division of Water Rights planned HAB Monitoring Plan for the Delta, developing guidance on incorporating HAB monitoring into permits, and developing internal guidance on sampling small water systems for HABs this past year.

A conceptual model for risk development is included in FHAB Monitoring Strategy. The model lays out the foundation of a risk assessment tool to support identification of at-risk areas statewide. It is important to leverage the FHAB Monitoring Strategy to adequately determine waterbodies and watersheds at risk and to provide data into forecasting models and tools. As such, a comprehensive evaluation of satellite imagery and tools should be completed to determine waterbodies that are impacted by HABs. The Water Boards should explore the ability to use other satellite tools to evaluate smaller waterbodies and the cost effectiveness of employing these tools as recommended by the FHAB Monitoring Strategy. The Water Boards should implement the field-based monitoring strategy to collect base line ambient data for development of forecasting models and risk assessment tools – base line data from field-based monitoring is considered complementary to satellite data and necessary for quality models.

Currently, there is no dedicated funding to address HAB-impacted waters and it is rare for mitigation projects to be funded and implemented. However, with ongoing nutrient runoff, drought conditions, and increasing impacts from climate change, HABs occurrences are predicted to worsen. Therefore, the FHAB Program sees this as a major vulnerability for the state.

Research and Tools

Section 13182(a)(4) Requirement: Conduct Applied Research and Develop Tools for Decision-Support

Remote Sensing

The FHAB Program leverages satellite imagery data available from federal agencies. With this data, Water Boards and a contractor developed a web-based FHAB satellite tool that displays remotely sensed bloom data, which is used as a screening level analysis tool by the Water Boards and coordinating agencies. The satellite tool presents processed satellite imagery for approximately 250 waterbodies in California large enough to be detected by the satellite. The remotely sensed data can be used to support applied research and tool development such as informing risk models and status and trends assessments. The FHAB Program also allocates resources to streamline and standardize data evaluation and sampling procedures to ensure quality and comparable data.

This past summer, State Board FHAB Program staff worked with the contractor to add chlorophyll-a (photosynthetic pigment to detect algal blooms) data to the web based FHAB satellite tool as an additional screening measure. This was prompted after the unprecedented 2022 San Francisco Bay red tide event so that the Water Boards would have chlorophyll-a satellite data readily available for coastal and estuarine areas to timely screen and surveil for red tides on a near daily basis. Red tide events are now also posted on the HAB Web Map to ensure holistic messaging to the public on all types of harmful algal blooms occurring in coastal, estuarine, and freshwater environments.

The State Board FHAB Program has a contract with the SCCWRP to further refine how satellite imagery is applied and define parameters for application of different uses including surveillance, regulatory, and for determining trends. In 2023, a technical advisory committee and a technical user group were convened to gain insights as to the current science and the user needs for application. The State Board FHAB Program staff has been working with SCCWRP in developing the draft report for this effort. Considering the differing ecoregions and spatial extent of waterways in the state, the report will present novel approaches to begin informing important management questions.

Given the vastness of California and the thousands of waterbodies, the FHAB Program understands the value of investing in remote sensing technologies. This has been implemented through several pathways including:

- continued updates to the web based FHAB satellite tool,
- developing a report to articulate how the satellite imagery should be evaluated and used for different purposes, including documentation of known quality and metrics, and
- continued coordination with the National Oceanic and Atmospheric Administration and academic fellows in further pushing the envelope on uses of Sentinel-2 satellite data for application in California for detection and prediction of HABs in thousands of waterbodies.

Given the investment by the FHAB Program, there are still advances left untapped with the limited programmatic resources to invest monetarily and with technical expertise to support national efforts.

Benthic Cyanobacteria Research

The science on HABs continues to evolve and this year the North Coast, Central Valley, and Lahontan Regional Boards FHAB Program staff and State Water Board FHAB Program staff partnered with U.S. Environmental Protection Agency Office of Research and Development to implement a study evaluating sampling protocols for benthic HABs in wadable creek/river systems to inform public health threat and to evaluate ecosystem compositions. The Water Boards FHAB Program has also recognized this need to evaluate sampling protocols and invested in updating standard operation procedures for this type of sample collection to inform public safety and reconvened the CCHAB

Network's benthic subcommittee in the spring 2023. The subcommittee has brought together volunteers from academia and technical experts to review recent science and literature to develop revised processes to address benthic HABs. The North Coast Regional Board also complimented previous benthic HAB studies this past summer to help inform future protocol recommendations and corresponding advisory recommendations. Altogether, the findings from these projects will be used to improve benthic HAB event response and monitoring targeted for implementation in late 2024.

Outreach and Education

Section 13182(a)(5) Requirement: Provide outreach and education and maintain a centralized internet website for information and data related to harmful algal blooms

The FHAB Program continues to maintain and update the My Quality Portal which houses the HAB Web Map, educational materials for the public, and guidance and standard operating procedures for agencies in responding to HABs. Updates this past year include making news advisories and weekly report updates readily available for download through the portal. This way, the public can keep apprised of all available information in one repository. The FHAB Program continues to support counties, tribes, and community groups by prioritizing training and informal meetings to onboard them as partners. This includes the development of a streamlined wiki in the past year to guide interested partners in different types of monitoring and ways they can coordinate with the FHAB Program.

But with limited FHAB Program resources, targeted and more robust outreach efforts are not conducted, and few resources are available to support our partners in addressing HABs. Funding for analyses is limited and earmarked primarily for incident response which leaves no support to fund follow up sampling to inform appropriate public health advisories, as well as assisting partners in getting monitoring programs initiated. The HAB Web Map is also maintained internally by the Office of Information Management and Analysis and so improvements are implemented only when there is capacity and continues to not meet the needs of the FHAB Program and partners. For example, desired improvements to the recreational advisory map includes publishing relevant photos of HAB events and displaying water testing data with each report.

The State Water Board has recently adopted new beneficial water uses specific to CA native tribal, cultural, and subsistence uses. To identify relevant waterbodies across the state to adopt these uses, targeted engagement is needed to ensure those uses are protected from HABs as they may impact tribal culture uses and subsistence through bioaccumulation of HAB toxins in fish and shellfish tissues. Development of new policy will also include coordination with tribes to gain better insight as to waterbodies of cultural significance to then prioritize HAB monitoring and collection of data to inform a cultural use exposure assessment, a key element to develop human health risk assessment to derive protective thresholds.

Consultation with Other Agencies and Tribes

13182 (a) Requirement: Consult with the CWQMC, OEHHA, CDPH, DWR, CA DFW, Dept. of Parks and Recreation, other appropriate state agencies, and CA Native American tribes

The FHAB Program has five dedicated staff in the Water Boards. The FHAB Program is often requested for technical expertise regarding review of reports, potential monitoring plan developments, historical data or anecdotal knowledge of waterbodies, and general support of programs. In cases where there is in-house expertise, there is often just one staff member, which creates challenges to implement the many tasks that are necessary for this ever-growing program. There has been opportunistic outreach and or collaboration with many of the above-listed entities but limited in targeted outreach. In addition, opportunistic collaboration is temporary and requires formal agreements, such as memorandum of understandings, to work towards shared goals. As mentioned, responding to HAB incidents is voluntary and not funded beyond the AB 834 mandate. Therefore, many partnering inter- and intra-agency partners and counties are unable to prioritize it due to limited resources and its voluntary nature.

The State Water Board FHAB Program staff hosted Board briefings in February 2023 to introduce the new FHAB Program, share what the program is doing to address HABs, what improvements are necessary, and the findings from the comprehensive gap assessment (included in the 2022 Legislative Report) to keep the Board apprised to successes and constraints of the program. The FHAB Program recognizes that there could be better consultation and mechanisms in place to foster better collaboration and communication for HABs across the state, but it is often challenging to pursue with limited staff resources.

Conclusion

The FHAB Program has been funded with five Water Board staff and $750,000 annually since 2021, with staff on-boarded in June 2021. With the FHAB Program formally operating for the last two and half years, it is estimated that FHAB Program staff, both dedicated and undedicated, have responded to almost 2,000 HAB incident reports across the state, developed a dozen new partner monitoring programs, some still ongoing, performed three years of holiday assessments, launched an entirely new web-based data system, and encumbered over $2.25 million into contracts including laboratory services and HAB research. Given the successes, it’s important to acknowledge the shortfalls.

The FHAB Program has strived for improving coordination and collaboration in addressing HABs across the state, but the limited resources have imposed triaging these types of partnerships based on threat to public health. Water quality standards and thresholds are critical to implement monitoring and management of HABs effectively. HAB incident response is often inconsistent due to the voluntary nature and

so the public is not kept well informed as to the health risk. Even with the improvements to the Water Boards FHAB web-based data system, compiling and collating statewide data remains a challenge due to differing repositories and data ecosystems. The updates necessary to the FHAB data system to ingest outside data would necessitate dedicated Water Board Division of Information and Technology resources. As much as the FHAB Program has tried to implement the FHAB Monitoring Strategy in developing partner monitoring programs, additional resources are necessary for consistent, funded, and robust programs across the state. The FHAB Program also would like to see continued improvement in collaborating with those groups most affected by HABs, including tribes and disadvantaged communities, in both resources and Water Board technical support.

With the rising reports of HABs across California, and unknown consequences of long-term climate change, California needs a fully implemented FHAB program at this critical juncture. To fully realize the objectives of AB 834, as well as further enhance California's ability to protect its people, action must be taken to allow for enhancement and expansion of the program, including formalized partnerships with other agencies and integration into other Water Boards programs for determining FHAB impairments and informing regulatory measures to prevent and address FHAB impairments. Additional information on prior legislative reporting that contains more granular information on previous programmatic efforts and the 2022 comprehensive gap assessment that outline additional resources and funding needed to implement AB 834 can be found on the SWAMP FHAB Programmatic webpage.