



Delta Stewardship Council

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Dr. Keith Bouma-Gregson
California Freshwater Harmful Algal Blooms Program
State Water Resources Control Board
Office of Information Management and Analysis
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Delivered via email to Jayme Smith (jaymes@sccwrp.org) and Keith Bouma-Gregson (Keith.Bouma-Gregson@waterboards.ca.gov).

RE: California Water Boards' Framework and Strategy for Freshwater Harmful Algal Bloom Monitoring

Dear Jayme and Keith:

Thank you for providing us with the opportunity to comment on the California Water Boards' draft document *Framework and Strategy for Freshwater Harmful Algal Bloom Monitoring*.

We applaud your progress in this impressive document toward identifying the substantial considerations required to effectively monitor freshwater HABs (FHABs) across the state of California. The document justifies recommendations and special studies extremely well, noting the key knowledge gaps or efforts needed to proceed. Harmful Algal Blooms (HABs) are already a major concern in the Sacramento San Joaquin Delta, and we anticipate that the hazard they pose to the beneficial uses of water there will only increase as climate change progresses. The framework you provide makes it clear that much work must yet be done, but the document sets forth a clear vision for how the extent of the HABs problem in the Delta and throughout California can best be characterized by implementing open, collaborative science.



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The 2009 Delta Reform Act created the Delta Stewardship Council (Council) with a primary responsibility to develop and implement a legally enforceable, long-term management plan for the Delta. The Legislature required the Delta Plan to advance the coequal goals of protecting and enhancing the Delta ecosystem and providing for a more reliable water supply for California, and to do so in a manner that protects and enhances the Delta as an evolving place. The 2009 Delta Reform Act also established the Delta Science Program and its mission to provide the best possible unbiased scientific information to inform water and environmental decision-making in the Delta. That mission shall be carried out through funding research, synthesizing and communicating scientific information to policy- and decision-makers, promoting independent scientific peer review, and coordinating with Delta agencies to promote science-based adaptive management.

We recommend integrating an explicit peer review process into the development of status and trends monitoring plans as discussed in Chapters 3 and 4. Experts in statistics, monitoring design, HABs, etc. should provide structured feedback to the partner agencies through formal reviews of proposed monitoring plans to ensure they meet the guidelines and goals set forth in this document. The Council's Delta Science Program is a leading coordinator of [independent scientific peer review](#); our process uses independent scientific experts and established guidelines ([Delta Science Plan](#), Appendix H) to provide credible and legitimate science for water and environmental decision-making.

Strengths

The introductory chapter sets up well the framework for FHAB monitoring. We are encouraged to see that swimming, fishing, and fish and shellfish consumption by some groups were treated appropriately as environmental justice issues and that beneficial uses specific to tribal and cultural practices were considered explicitly.

The resource tiers provide helpful guidelines to encourage participation by diverse groups of stakeholders, and the monitoring guidance provided will be an invaluable resource for managers who need to identify and manage HABs. The tiered approach to partnership sampling is a productive way to support both local entities and to stretch State resources to benefit more recipients. The framework that discusses leveraging existing programs to reduce cost and increase efficiency is valuable and important in addressing HABs holistically (e.g., Clean Beaches Program).

Input from the Technical Advisory Committee (TAC) was well-utilized and integrated throughout the report. Readers with no knowledge of the TAC discussions will appreciate seeing TAC recommendations and the areas of agreement and disagreement. The utility and limitations of different approaches are explained clearly and thoroughly (e.g., remote



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sensing, web tools, and various sampling approaches), and the use of call-out boxes relays important supplemental information.

Weaknesses

Expanding the use of direct educational outreach (person-to-person) in the framework may be beneficial, and could allow groups to be aware of opportunities and be able to formulate their own outreach campaigns. A well-informed public could be an additional resource for incident reporting (e.g., boaters/fishers reporting incidents) and would be an excellent source of volunteers for non-governmental organizations (NGOs) and local agencies. In addition, an informed public can reach out to community leaders and advocate for the development of monitoring programs. The “Boating Safety and Education for All” outreach program led by the California Department of Parks and Recreation, Division of Boating and Waterways (DBW) is an example that could inform a HABs public outreach effort. Outreach could be conducted similarly at popular beach destinations, boat launches, and marinas. We recommend that the Water Boards work with DBW to include HABs awareness in their outreach, similar to how invasive mussels / species are included in their campaigns.

To improve the document's readability and promote action, use more concise language and active verbs throughout. For example, the sentence on page one "While HAB species are naturally occurring, human activities can alter the environment in ways that promote HABs to increase their magnitude" would be much clearer as "While bloom-promoting species exist naturally, humans alter the environment in ways that promote HABs or increase their magnitude." We noted many minor typos and some unclear text throughout; these are highlighted as comments in the attached PDF. We also noted that an inset box titled “Status of Marine Monitoring” is referenced but not included.

Consider using stronger wording or giving additional attention to key findings in the narrative such as the need to focus financial support to under-served communities disproportionately affected by HABs (p. 42) or that current cyanotoxin trigger levels do not adequately protect against the dangers of benthic mats (p. 38).

Comments on recommendations and/or special studies

From the Council's perspective, most, if not all the recommendations and/or special studies are beneficial because of the wide-ranging impacts of HABs. The social and health effects of HABs are of particular concern, as they are already impacting Delta communities.

Recommendations #1, 2, 4, and 5 relate directly to the Delta Plan's [Harmful Algal Bloom performance measure](#) (PM 6.10). Increased monitoring quality, data management, and



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transparency combined with increased use of remote sensing will greatly improve HABs tracking and reporting within the Delta. Special Studies pertaining to those recommendations would be an added benefit. We agree that the Special Studies discussed are high priorities.

Our stakeholder engagement during ongoing efforts to develop the 2022-2026 Science Action Agenda has affirmed the importance of HABs and HABs management to the Delta community. We engaged a broad group of Delta scientists and stakeholders to update this agenda by identifying the science actions that are needed to inform management decisions to better serve the diverse interests of Delta groups. For HABs, community input has identified this high-ranking and cross-cutting question: “How can factors (e.g., water flow and residence time, turbidity, water temperature, nutrient concentrations) be managed to encourage productivity in lower trophic food webs while also preventing harmful algal blooms, taste and odor issues, and macrophyte growth?” We hope to engage with the California Cyanobacteria and Harmful Algal Bloom Network and to use the list of high-priority recommendations and Special Studies to inform the highest-priority science needs for the Delta.

Potential leveraging opportunities

Estuaries pose unique monitoring challenges; the Delta Stewardship Council and others (including Delta Regional Monitoring Program, US Bureau of Reclamation, and the State Water Contractors) have funded work to improve monitoring capabilities within the San Francisco Estuary. For example, the Council supports research by the United States Geological Survey (USGS) piloting the use of advanced, multispectral fluorometers to collect data on the composition of the phytoplankton community in real-time. This work includes installing these instruments at three fixed stations in the Delta, collecting discrete phytoplankton samples in parallel to verify measurements of community composition, and adding a fluoroprobe and Solid Phase Adsorption Toxin Tracking (SPATT) sampler to several high-frequency cruises that cover a vast spatial domain. The results offer a synoptic look at the phytoplankton community structure, FHAB toxins, and their environmental drivers. More information about this project is [available at the California Water Science Center's website](#).

While still in the early stages, USGS is also developing a sensor to detect microcystin and other HAB toxins in the field and collect high-frequency measurements. Incorporating emerging methodologies such as these into future FHAB monitoring plans is another area that would benefit substantially from independent expert peer review.

Thank you for considering our comments. We look forward to working with you and supporting implementation of this Strategy.



**Delta
Stewardship
Council**

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Sincerely,

Louise Conrad

Louise Conrad

Deputy Executive Officer for Science

Delta Stewardship Council

Delta Science Program

Attachment: Council_comments_1141_FHABStrategy_FullReport.pdf