



California Voluntary Guidance for Response to HABs in Recreational Inland Waters

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This voluntary guidance will assist responding organizations, including environmental and public health officials, land and waterbody managers, citizen scientists, and others in responding to inland harmful algal blooms (HABs) in California. Resources specific for **PLANKTONIC** (water column) HABs and **BENTHIC MATS** (which typically grow as mats along bottom substrate) are included below. For more information on **BENTHIC MATS** (also referred to as **TOXIC ALGAL MATS** for the general public) and how they differ from **PLANKTONIC** blooms within the water column, check out the [FAQs on TOXIC ALGAL MATS](#) page.

This guidance does not address cyanotoxins in drinking water; State Water Board's Division of Drinking Water provides resources for addressing cyanotoxins in drinking water.



HAB Response Plan Summary and Key Resources

Table 1 below summarizes the current HAB Response Plan, the recommended actions, and key resources available on the California HAB Portal. This response plan can be adapted for a given incident, some steps may occur in a different order or simultaneously.

Recommended Actions¹ and Key Resources

Step 1: Surveillance and General Awareness

Responding organizations (Water Boards, land/water manager, local health agency and/or collaborator) should visually inspect publicly accessible rivers, lakes, and reservoirs during recreation season for potential HABs, including those in the water column (**PLANKTONIC**) and mats attached to the bottom, floating, or stranded along the shore (**BENTHIC MATS**).

Responding organizations can use general awareness signs to inform the public about potential **PLANKTONIC** HABs or **BENTHIC MATS**.

Resources:

- [Visual guide](#)
- [Field Guide: Health and Safety Guide](#)
- [Field Guide: Site Reconnaissance SOP](#)
- [FAQs for **TOXIC ALGAL MATS**](#)
- [General awareness sign for **PLANKTONIC** HABs](#)
- [General awareness sign for **BENTHIC MATS**](#)

Step 2: Initial Discovery and Reporting

Reports of potential HAB occurrences and any potentially related human or animal illnesses should be made to the HAB Hotline (managed by Water Boards) by using any of the following:

- Online: [Freshwater Bloom Incident Form](#)
- phone: 1 (844) 729-6466 (toll free)
- email: CyanoHAB.Reports@waterboards.ca.gov

Water Board staff will evaluate initial reports and post to the HAB portal incident map as appropriate.

Resources:

- [Freshwater Bloom Incident Form](#)
- [HAB incident map](#)
- [HAB-related illness tracking webpage](#)

Step 3: Interagency Response Coordination and Communication

As shown in Figure 1 below, Water Boards HAB coordinator coordinate with the reporting party and agency staff in responding to the HAB.

When potential HAB-related human or animal illnesses are reported, staff from an interagency HAB-related illness workgroup follow up to collect additional information and provide assistance.

If initial results indicate that cyanotoxins are present in a waterbody with a potential drinking water intake, report to the HAB Hotline immediately.

Water Boards Div. of Drinking Water will immediately notify the water purveyor.

Downstream users of the impacted waterbody should be informed since cyanobacteria cells and toxins can be transported many miles downstream.

Recommended Actions¹ and Key Resources

Resources:

- [Figure 1, Interagency Response Coordination](#)
- [Table 2, State Agency Contacts](#)
- [Division of Drinking Water's HAB Resources](#)
- [Resources for veterinarians and medical professionals](#)

Step 4: Field Screening Responding organization can use field screening methods for initial determination if cyanobacteria and cyanotoxins are present. As necessary, samples may be collected for lab analysis at this step (refer step 5). If visual indicators of **PLANKTONIC** HAB or **BENTHIC MATS** or a HAB-related illness is suspected, post corresponding advisory sign at the water body to inform recreationalists of potential health risks. Sign posting should be reported to the HAB Hotline.

Resources:

- [Visual guide](#)
- [Field Guide – Field Screening Methods](#)
- [Advisory Signs and Posting Guidance for **PLANKTONIC** HABs](#)
- [Trigger level sign posting guidelines for **BENTHIC MATS**/toxic algal mats](#)

Step 5: Sampling for Lab Analysis Responding organization should collect water, scum, or algal mat samples for laboratory analysis consistent with the Field Guide. Contact HAB Hotline to coordinate potential field support and/or laboratory analysis. Refer to Field Guide SOP for sample storage (refrigerated) and short holding time (< 5 days). Sample submitting party should report lab results to the HAB Hotline. Water Board staff will evaluate and post to the HAB portal map.

Resources:

- [Field Guide: SOP for sample collection](#)
- [Monitoring and Laboratory analysis](#)
- [Freshwater Bloom Incident Form](#)
- [HAB incident map](#)

Step 6: Posting Advisory Sign If analyses or observations meet or exceed TRIGGER LEVELS for **PLANKTONIC** HABs or **BENTHIC MATS**, the responding organization should initiate coordination regarding sign posting by reporting to the HAB Hotline. Water Board will recommend that the corresponding **ADVISORY** sign be posted, and will coordinate posting and notification with the water agency, local health authorities, land and water management agency, and/or local

Recommended Actions¹ and Key Resources

county coordinators. In some circumstances, Regional Water Board staff may post signage.

Public notification by press and social media can be coordinated with the Water Boards, and outreach and communication tools are available.

Resources:

- Advisory Signs and Posting Guidance for **PLANKTONIC** HABs
- Trigger level sign posting guidelines for **BENTHIC MATS**/toxic algal mats
- Freshwater Bloom Incident Form
- Figure 1, Interagency Response Coordination
- HAB Outreach and Communication tools

Step 7: Continue Monitoring During an Advisory

While under an advisory, water should be observed approximately bi-weekly by the responding organization. If observations suggest that the bloom or algal mats are significantly increasing or decreasing, then the responding organization should conduct follow-up monitoring for cyanotoxins and/or cyanobacteria ².

Resources:

- Field Guide
- Field Guide: Visual guide
- Field Guide: Site Reconnaissance SOP
- Monitoring and Laboratory Analysis

Step 8: De-posting and Routine Monitoring

Once the visual indicators and/or cyanotoxin concentrations are below the de-posting criteria for **PLANKTONIC** HAB or **BENTHIC MATS** for minimum of two consecutive weeks, signage should be removed by the land and water management agency and/or local county coordinators. De-posting actions should be reported to the HAB Hotline. Public notification of de-posting by press and social media can be coordinated with the Water Boards, and outreach and communication tools are available. Routine monitoring should continue during the recreation season ².

Resources:

- Posting guidance for **PLANKTONIC** HABs
- Trigger level sign posting guidelines for **BENTHIC MATS**/toxic algal mats
- HAB Outreach and Communication tools

¹Notification and communication is a key component of each step in the process.

² While this guidance provides a response to current HABs, long-term plans are ultimately necessary to manage, mitigate, and prevent HABs. Contact the [SWRCB's Surface Ambient Monitoring Program \(SWAMP\)](#), and check out the California Cyanobacterial and Harmful Algal Bloom (CCHAB) Network Mitigation Subcommittee's [Resources for Mitigating HABs](#) page.

Interagency Response Coordination

Reports of HABs or potential HAB-related illnesses are received through the State Water Board's [reporting system](#). Once received, the report is investigated by the Interagency Task Force in a coordinated response with state and local representatives (see Figure 1 below) and displayed on the [HAB incident report map](#).

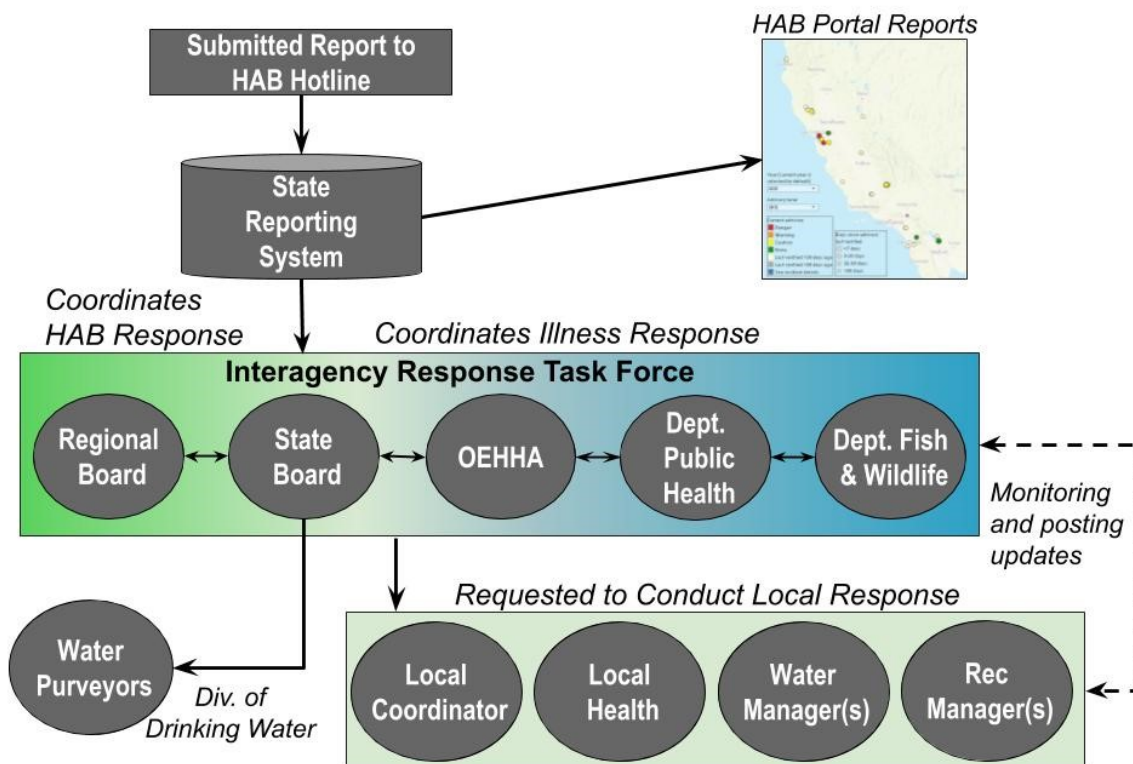


Figure 1. Interagency Response Coordination graphic (see Table 2 below for State agency contacts)

HABs Response Contacts Table

Table 2 below provides contact information for staff at state agencies participating in the interagency task force.

Table 2. State Agency contacts for HAB response and the HAB-related illness workgroup

Organization	Contact Information
HAB Hotline , State Water Resources Control Board (State Board)	cyanoHAB.reports@waterboards.ca.gov
<ul style="list-style-type: none"> State Board Lead HAB staff 	Carly.Nilson@waterboards.ca.gov ; Marisa.Vandyke@waterboards.ca.gov
<ul style="list-style-type: none"> State Board, Interagency Coordination Lead 	Greg.Gearheart@waterboards.ca.gov
<ul style="list-style-type: none"> State Board, Division of Drinking Water 	View this map to select appropriate district office contact
Regional Water Quality Control Boards (Regional Board) Map	View the map on left to select appropriate region listed below (Regions 1-9)
<ul style="list-style-type: none"> Region 1, North Coast 	Michael.Thomas@waterboards.ca.gov ; Rich.Fadness@waterboards.ca.gov
<ul style="list-style-type: none"> Region 2, San Francisco Bay 	Kristina.Yoshida@waterboards.ca.gov Rebecca.Nordenholt@waterboards.ca.gov
<ul style="list-style-type: none"> Region 3, Central Coast 	Melissa.Daugherty@waterboards.ca.gov
<ul style="list-style-type: none"> Region 4, Los Angeles 	Emily.Duncan@waterboards.ca.gov
<ul style="list-style-type: none"> Region 5, Central Valley 	Dana.Shultz@waterboards.ca.gov
<ul style="list-style-type: none"> Region 6, Lahontan 	Sabrina.Rice@waterboards.ca.gov Mary.Fiore-Wagner@waterboards.ca.gov
<ul style="list-style-type: none"> Region 7, Colorado River 	Jeff.Geraci@waterboards.ca.gov
<ul style="list-style-type: none"> Region 8, Riverside 	Barbara.Barry@waterboards.ca.gov Katie.Duprey@waterboards.ca.gov Paloma.Abell-oroSCO@waterboards.ca.gov
<ul style="list-style-type: none"> Region 9, San Diego 	Carey.Nagoda@waterboards.ca.gov Deborah.Woodward@waterboards.ca.gov

Organization	Contact Information
Cal EPA, Office of Environmental Health Hazard and Assessment	Regina.Linville@oehha.ca.gov; Shannon.Murphy@oehha.ca.gov
Tracking California / California Department of Public Health	Thomas.Hayashi@cdph.ca.gov
California Department of Fish and Wildlife, Statewide HAB Coordinator	Karen.Atkins@Wildlife.ca.gov (primary contact)
California Department of Fish and Wildlife, Wildlife Health Laboratory	WILab@wildlife.ca.gov (*general info); Krysta.Rogers@wildlife.ca.gov (bird specialist) Jaime.Rudd@wildlife.ca.gov (mammal specialist)

* Note that the WIL email will likely change to WHL at some point

Advisory Signs and Posting Guidance for Planktonic HABs

Participating state agencies - State Water Resources Control Board, Office of Environmental Health Hazard and Assessment (OEHHA), and California Department of Public Health (CDPH) - developed these guidelines for **PLANKTONIC** (water column) blooms. The [California Cyanobacteria and Harmful Algal Bloom Network \(CCHAB\)](#) under the California Water Quality Monitoring Council adopted them as voluntary guidance (not policy or regulation) in 2016, and recommends their use to promote consistency in public notification and risk communication throughout California. A [frequently asked questions \(FAQs\) on HAB signs](#) is available for the general public.

Planktonic HAB Posting Guidance

These trigger levels and decision tree for posting PLANKTONIC advisory signs (Caution, Warning, and Danger) were developed to protect human and animal (dogs and livestock) health from HABs. The trigger levels are based on the following criteria: concentrations of three major cyanotoxins in water, cell count of potential toxin producers, and site specific indicators. For more information on how these levels were derived, refer to Appendix A - Description of cyanotoxin trigger levels in recreational water bodies.

- [Trigger Levels and Response Decision Tree for Planktonic Blooms](#)
- [Appendix A - Description of cyanotoxin trigger levels in recreational water bodies \(PDF\)](#)

Table 3. CCHAB trigger levels for posting PLANKTONIC advisory signs.

Trigger Levels For Human and Animal Health				
Criteria*	No Advisory ^a	Caution (TIER 1)	Warning (TIER 2)	Danger (TIER 3)
Total Microcystins ^b	< 0.8 µg/L	0.8 µg/L	6 µg/L	20 µg/L
Anatoxin-a	Non-detect ^c	Detected ^c	20 µg/L	90 µg/L
Cylindrospermopsin	< 1 µg/L	1 µg/L	4 µg/L	17 µg/L
Cell Density of potential toxin producers	< 4,000 cells/mL	4,000 cells/mL	_____	_____
Site-specific indicator(s)	No site-specific indicators present	Discoloration, scum, algal mats, soupy or paint-like appearance. Suspected illness	_____	_____

* Action levels are met when one or more criteria are met.

^a For de-posting, all criteria for no advisory must be met for a minimum of 2 weeks. General awareness sign may remain posted and healthy water habits are still recommended.

^b Microcystins refers to the sum of all measured Microcystin congeners.

^c Must use an analytical method that detects $\leq 1 \mu\text{g/L}$ Anatoxin-a.

Response Decision Tree for Planktonic Blooms

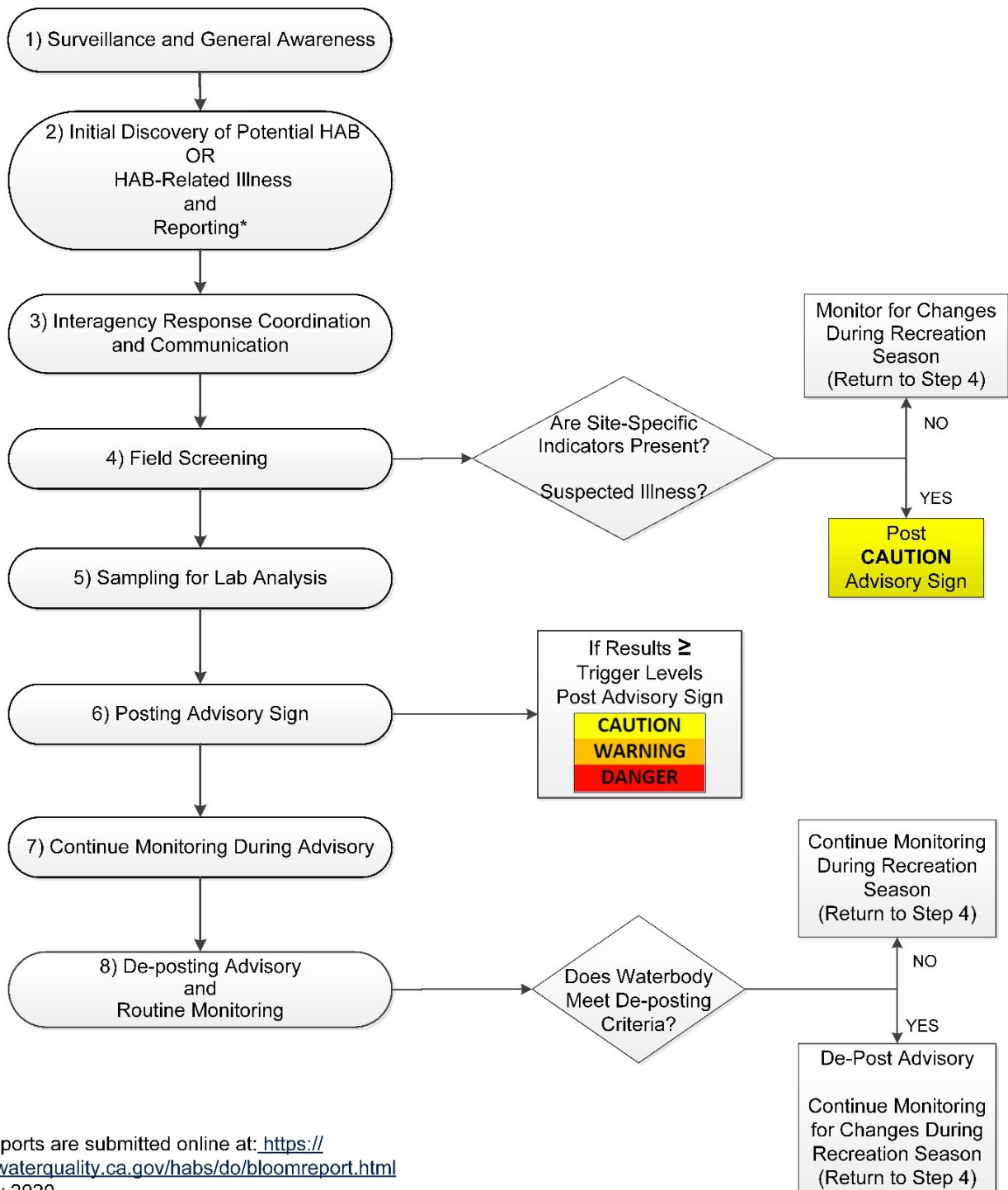


Figure 2. Response Decision Tree for Planktonic Blooms

Planktonic HAB Advisory Signs

The Planktonic HAB advisory signs are available in both English and Spanish, either as an individual signs in a single language or as a combination with both languages on one sign.

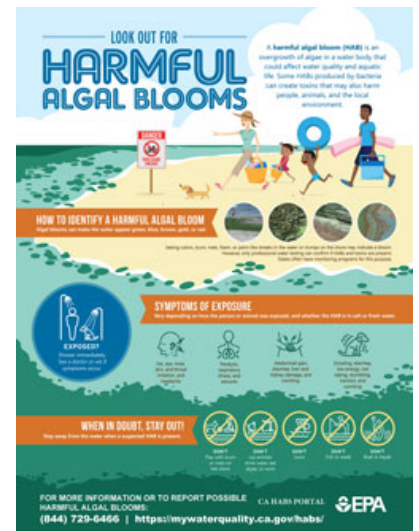


- The PDF format provides pre-made planktonic HAB advisory signs and space to insert local agency contact information. The English, Spanish, and English/Spanish combination versions of all three signs (Caution, Warning, Danger) in PDF format are combined into a single file.
- The PowerPoint format allows customization of signs by deleting individual icon/text message components that are not appropriate for a specific water body, such as messaging specific to an activity that is not otherwise permitted. However, text with each component cannot be changed. Components can be moved to allow more space for local agency contact information (text box at the bottom of each sign). The English and Spanish versions of all three signs (Caution, Warning, Danger) in PowerPoint format are combined into a single file.
- The individual signs and icons (in PowerPoint format) are also available as supplemental information.

Planktonic General Awareness HAB Signs

The **PLANKTONIC** general awareness HAB signs below are two templates provided by the US EPA that have been customized for California.

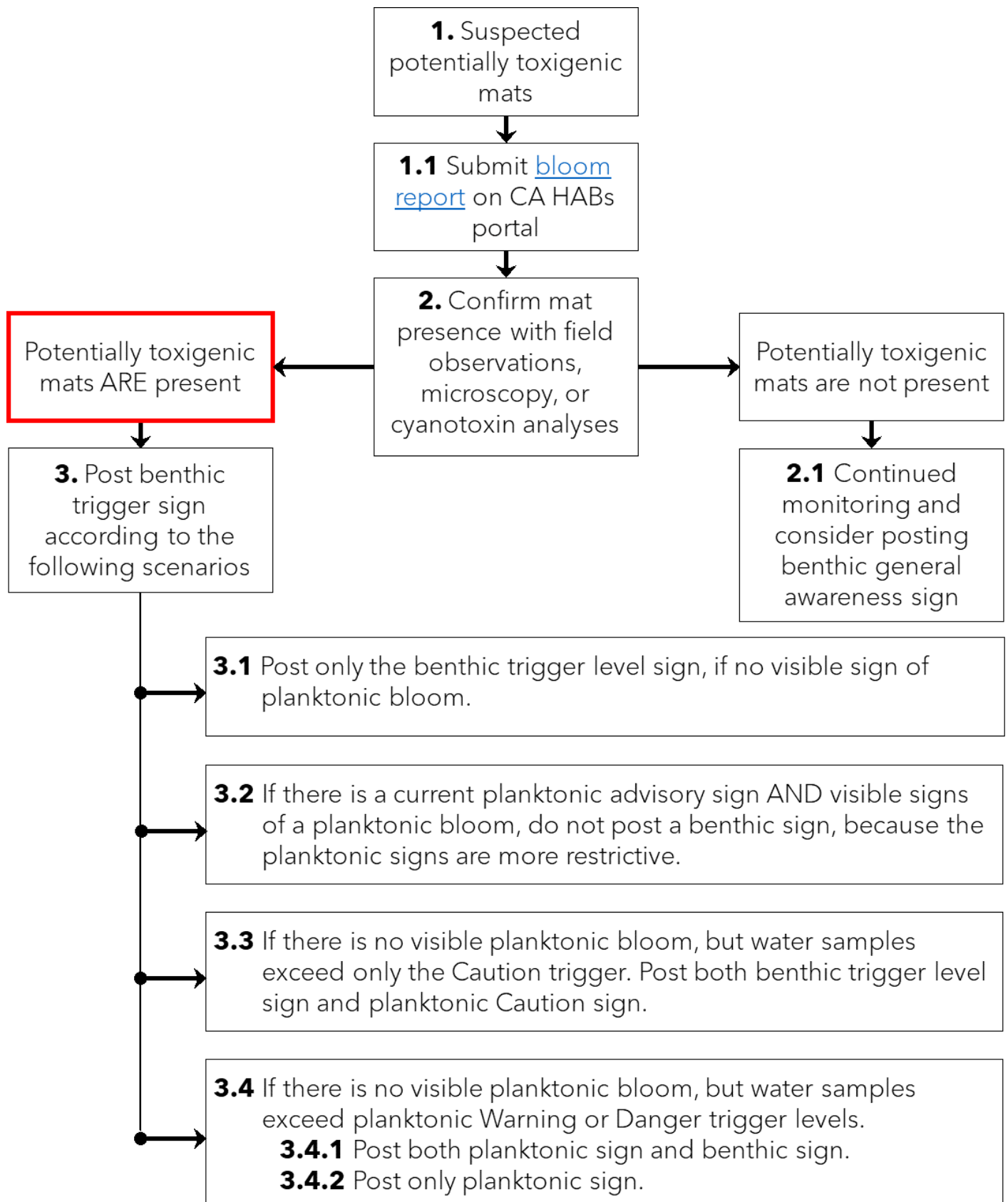
- Abbreviated infographic (PDF)
- Detailed infographic (PDF)
- General awareness signs or infographics can be used to inform the public of the potential for **PLANKTONIC** HABs, how to identify them, potential symptoms, healthy water habits, and where to find additional resources.
- These signs can be posted permanently at waterbodies where **PLANKTONIC** HABs may occur and used in combination with advisory signs triggered by specific visual observations or water column cyanotoxin results as described above.
- These signs are not intended to replace advisory signs or preclude water testing for cyanotoxins.



Benthic Cyanobacteria (Toxic Algal Mats) Signs and Posting Guidelines

The CCHAB Network Benthic Signage Subcommittee developed signs (general awareness and BENTHIC trigger level) and posting guidelines for BENTHIC MATS, also referred to as TOXIC ALGAL MATS. These resources were reviewed and adopted for use by CCHAB Network in 2020.

- Full description of the benthic algal mat signs and [advisories](#)
- [FAQs on Toxic Algal Mats](#)
- [Posting Guidelines for Benthic Mats Signs](#)
- General Awareness Sign
- Benthic Trigger Level Sign



CHECK FOR ALGAE

Toxic algal mats may be present in this water
Mats can be attached to the bottom, detached and floating, or washed up on shore

Common examples



If you see algal mats:

 **Do NOT let children or adults touch, eat, or swallow any algal mats.**

 **Do NOT let dogs eat algal mats or drink from the water.**

Call your doctor or veterinarian if you or your pet get sick after contacting or ingesting algae. For more information on toxic algae visit: mywaterquality.ca.gov/habs
For local information, contact:

TOXIC ALGAE ALERT

Toxic algal mats ARE present in this water
Mats can be attached to the bottom, detached and floating, or washed up on shore

 **Do NOT let children or adults touch, eat, or swallow any algal mats.**

 **Do NOT let dogs eat algal mats or drink from the water.**

Common examples




Call your doctor or veterinarian immediately if you or your pet get sick after contacting or ingesting algae. For more information on toxic algae visit: mywaterquality.ca.gov/habs
For local information, contact:
Date posted:

HAB Outreach and Communication

In addition to signage, other forms of outreach and communication may be appropriate, both during a current incident and to increase awareness of potential HABs and their potential health impacts. Resources available on the CA HABs Portal are summarized below. US EPA also provides general HAB communication tools.

Public notifications and press communications for a current HAB incident

- State Water Resources Control Board can assist with notifications and press communications, and has developed templates (including press and social media templates and talking points) available upon request. For details contact the HAB Hotline at CyanoHAB.Reports@waterboards.ca.gov or 844-729-6466 (toll free).
- Protocol for Publicizing Harmful Algal Blooms (HABs) in State Waterbodies (06/25/2018).



Media Release

**Water Boards Ramp Up Testing For Harmful Algal Blooms
Waterways Targeted Statewide Ahead of Busy Labor Day Weekend**

For Immediate Release: Thursday August 28, 2019 **Contact:** Keith Bouma-Gregson 916-322-8430
Greg Gearhart 916 341-6892

SACRAMENTO – The State Water Board and nine regional water boards have ramped up testing for harmful algal blooms at popular lakes and streams throughout the state in time for the latest data to be posted ahead of the busy Labor Day weekend, when many Californians will be seeking guidance about which waterways offer safe and healthy recreation options.

With awareness of this emerging trend at an all-time high in 2018, the heightened scrutiny comes as harmful algal blooms, or HABs, have made news statewide and throughout the nation with reports of dogs falling ill or even dying shortly after swimming in waters with suspected blooms.

In 2018, 190 reports of potential blooms were received, and state and local agencies posted approximately 145 public health alerts at waterbodies throughout California. The interagency HAB-related illness Working Group received 44 reports of potential HAB-related human and animal illnesses in 2018. Following further evaluation of the available environmental and health related information, the California Department of Public Health (CDPH) reported 19 cases to the Centers for Disease Control's (CDC) One Health Harmful Algal Bloom System (OH-HABS) as suspected, probable, or confirmed link to HAB exposure. These reported cases included 8 human, 4 domestic animal, and 7 fish or wildlife incidents.

Best identified by its blue-green, slickly appearance in water but sometimes not readily detected visually, HABs can be a danger to humans and animals. Cyanotoxins in the algal blooms can trigger a range of health concerns, including irritation to the respiratory system, as well as skin, nose, eye, and throat discomfort.

Dogs and children are most vulnerable, as they tend to spend more time playing in the water and are more likely to swallow it.

Last week, the Water Boards gathered testing samples at many of the state's most visited lakes and streams with a history of HABs, part of an annual collaborative effort with state and local agencies to gather data and share it with the public. This is the third consecutive year of heightened testing prior to Labor Day. The Water Boards, the

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Resources for use with the general public

- Frequently Asked Questions (FAQs) on Freshwater and Estuarine Harmful Algal Blooms
- FAQs on Human Health
- FAQs on Dogs and Dog Owner factsheet

- [FAQs on Livestock and other Large Animals](#)
- [FAQs on Fish](#)
- [FAQs on Wildlife \(Wild Birds and Mammals\)](#)
- [HAB-Related Illness Tracking factsheet and webpage](#)
- [FAQs on HAB signs](#)
- [FAQs on toxic algal mats](#)
- [FAQs on HABs in Drinking water](#)

PROTECT YOUR PETS FROM HARMFUL ALGAL BLOOMS

How can I keep my dog safe from HABs?

- Do not let your dog drink, wade, or swim in water with a HAB present.
- Check if a waterbody has a reported bloom by viewing the [HAB Bloom Map](#), contacting the waterbody manager, and looking for [cyanobacteria signs](#).
- Check for visual signs of a HAB.¹
- If you are still unsure whether a bloom is a HAB, keep pets away from the water.
- Never let your dog eat scum or algae.
- Always wash your pets with clean water after water contact.

What are cyanobacteria and harmful algal blooms?

Cyanobacteria (also called blue-green algae) and algae can form harmful algal blooms (HABs) in lakes, ponds, and rivers. Many HABs produce toxins that can harm animals and people. The water may have a scum or be discolored (e.g., green, blue, yellowish, red, or brown). Some blooms may occur along the bottom of the waterbody or become detached and float to the surface or along the shoreline. A [visual fact sheet](#) is available to help the public identify HABs.² To learn more, visit the [California HABs Portal](#).

How can dogs be exposed to HABs?

- By swimming in lakes, rivers, ponds, or any affected water body, drinking the water, or eating algal material. Animals are attracted to the taste and smell of HABs. Dogs lick algae caught in their coat after being in the water. Dogs that scavenge around the shore may ingest drying clumps of algae.
- By consuming water and algal material from residential pools or decorative ponds.
- By ingesting health supplements containing blue-green algae, which may unintentionally include HAB toxins.

What are signs of possible cyanobacterial toxin poisoning in dogs?

Animals can experience symptoms within minutes to days following exposure to the toxins. Symptoms include vomiting, diarrhea, weakness, difficulty breathing, seizures, or death. In 2017, there were 18 reported dog deaths from suspected HAB-related exposures in California.

How can I report a suspected bloom or potential HAB-related illness?

Please report any suspected HAB or potential HAB-related illness using the [online report form](#)³, by calling (844) 729-6466, or by emailing ca.water@waterboards.ca.gov.

Additional information:

¹ Visual fact sheet: <https://mywaterquality.ca.gov/habs/hab-visual-fact-sheet>
² California HABs portal: <https://mywaterquality.ca.gov/habs/> HAB report map, advisory signs, online report form, other HAB information.
³ Veterinarian fact sheet: <https://mywaterquality.ca.gov/habs/hab-veterinarian-reference>

CalEPA Office of Environmental Health Hazard Assessment 2018

Resources for use with medical professionals and veterinarians

- Doctors and veterinarians may not be familiar with the symptoms of cyanotoxin exposure, potential treatment, and how to report potential HAB-related illnesses in humans, pets, and livestock.
- The online pages linked above include resources that can be shared with local medical providers and veterinarians to assist in appropriate diagnosis, treatment, and reporting, and to share with their clients.
- The [HAB-related Illness Tracking webpage](#) summarizes previously reported human and animal illnesses related to HABs in California.

Blue-Green Algae: A Veterinarian Reference

IDENTIFYING ILLNESS DUE TO BLUE-GREEN ALGAE

Exposure History | Clinical Signs | Diagnosis | Treatment | Reporting

DESCRIPTION OF THE PROBLEM

Blue-green algae (also known as cyanobacteria) are non-pathogenic photosynthetic bacteria that grow in outdoor water bodies and produce toxins such as microcystin, cylindrospermopsin and anatoxin-a. They can grow quickly and form large blooms, especially in warm weather.

Scope of the problem in California:

- Toxic blooms occur throughout California and are increasing in number, frequency and severity.
- Dog and livestock deaths in California have been linked to blue-green algal toxins.

EXPOSURE

Animals can be exposed to blue-green algae and its toxins by:

- Contacting any infected water body including lakes, rivers, ponds, etc. Because animals are attracted to blue-green algae, they drink the water and eat algal material. Dogs in particular lick algae caught in their fur after being in the water.
- Consuming water and algae from residential pools or decorative ponds.
- Ingesting blue-green algae health supplements.

CLINICAL SIGNS, DIAGNOSIS and TREATMENT: See page 2 and https://mywaterquality.ca.gov/habs/resources/clinical_signs_and_treatment_vets. For additional assistance contact the ASPCA Animal Poison Control Center: (888) 426-4435. Available 24 hours/day, 365 days/year. Limited funding may be available to cover physical examination of ill dogs with suspected poisoning.

REPORTING: Reporting confirmed or suspected cases will help prevent other animal and human exposures to blue-green algal toxins. Please complete the Illness Information Section on the Report Form available at <https://mywaterquality.ca.gov/habs/abdo/bloomreport.html>. For questions, call the State Water Resources Control Board at (844) 729-6466.

From the California Cyanobacteria and Harmful Algal Blooms Network. For more information see: www.mywaterquality.ca.gov/habs/

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