



California Freshwater & Estuarine Harmful Algal Blooms (HABs)



WHAT ARE CYANOBACTERIA AND HARMFUL ALGAL BLOOMS?

Cyanobacteria (also known as blue-green algae) and algae occur in freshwater and estuarine waterbodies. Algae and cyanobacteria have been around for billions of years and are natural components of ecosystems. They perform many roles that are vital to our aquatic communities, by being a food source and producing oxygen. However, when certain conditions are favorable for these organisms, algae and cyanobacteria can rapidly grow causing “blooms.” Algae and cyanobacteria can produce harmful compounds, such as toxins and taste and odor compounds, that cause health risks to humans and animals. When blooms pose a risk to humans, animals, and the environment, they are referred to as harmful algal blooms (HABs).

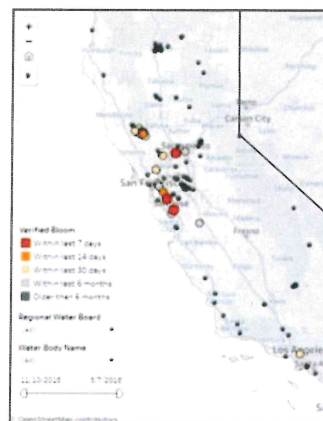
HOW DO I KNOW IF THERE IS A HAB IN THE WATER?

Sometimes the bloom is easily visible, forming a “scum” or discoloration on the water surface. Other times, it is less visible, floating beneath the surface or on the bottom of a water body (benthic). Blooms can appear green, blue, yellow, red, or brown. Cyanotoxins, produced by cyanobacteria, cannot be visually detected in water or tissues. Several guidance documents are available

to aid identification of algae and cyanobacteria ([Fact Sheet 1](#) & [Visual Guide](#)²), and the [California Freshwater HAB Field Guide](#)³ is available to assist in monitoring.

WHERE AND WHEN ARE HABs OCCURRING IN CALIFORNIA?

Voluntarily reported HABs are posted on the [HAB Reports Map](#)⁴. In recent years, HABs have been increasing in incidence, duration, and toxicity statewide, and as a result, human, domestic animal (dogs and livestock, in particular), and wildlife health impacts are on the rise. In 2017, almost 200 HABs were reported in drinking water and recreational water bodies; a two-fold increase from 2016. In some areas, the duration of HABs are increasing from predominantly summer blooms to year-round blooms in some areas.



WHAT CAUSES HABs?

Increased inputs of nutrients like nitrogen and phosphorus (from fertilizers and human or animal wastes), promote cyanobacterial growth

1— https://mywaterquality.ca.gov/habs/what/visualguide_fs.pdf

2— <https://drive.google.com/file/d/0B40pxPC5g-D0R2QtUVZhYzNlaXc/view>

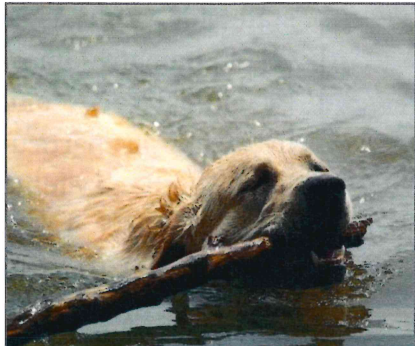
3— <https://mywaterquality.ca.gov/habs/resources/field.html>

4— https://mywaterquality.ca.gov/habs/where/freshwater_events.html

and can lead to increased occurrences of HABs. Low flows, stagnant water, increased intensity and duration of sunlight, and sustained high temperatures create the ideal conditions for HABs. Current research suggests that the rising temperatures and changing precipitation patterns caused by climate change are a catalyst for their growth.

WHAT ARE THE POSSIBLE HEALTH CONCERNS OF HABs?

Cyanotoxins and algal toxins pose risks to the health and safety of people and pets, drinking water, and recreating in water bodies affected by blooms. They can also accumulate in fish and shellfish to levels posing threats to people and wildlife. Symptoms of HAB-related illness⁵ in people and animals are available from the Centers for Disease Control and Prevention (CDC), and by contacting the California Poison Control Center (1-800-222-1222). Of the reported HAB-



related incidents in 2017, there were 25 domestic animal deaths, numerous fish and wildlife, and 8 human incidents of illness.

CAN ANIMALS BE AFFECTED?

Pets, especially dogs, are susceptible to HABs because they swallow more water while swimming and playing in the water. They are also less deterred by green, smelly water that may contain HABs. Animals can experience symptoms within minutes of exposure to the toxins. These symptoms include vomiting, diarrhea, weakness, diffi-

culty breathing, and seizures. In the worst cases, animals have died. If your pet experiences these symptoms after exposure, contact your veterinarian immediately. A veterinarian fact sheet⁶ and an outreach letter to veterinarians⁷ are available. For additional info refer to the Domestic Animals web page⁸.

WHAT GUIDELINES DOES CALIFORNIA USE FOR HABs?

Currently, there are no federal or state regulatory standards for cyanotoxins in recreational waters or drinking water. Participating state agencies have developed suggest-



ed guidelines for addressing health concerns for cyanotoxins in recreational waters⁹. The Department of Public Health, county health departments, and water body managers are encouraged to use this guidance for posting water bodies when HABs pose a health threat. Guidance is also available for addressing cyanotoxins in drinking water¹⁰.

WHAT CAN I DO?

- ! Report any suspected HAB or potential HAB-related illness¹¹
- 🏊 Practice Healthy Water Habits at your local lake, river, or stream!¹²
- 🌱 Help reduce nutrients in in your local lake, rivers, and streams by modifying some daily activities¹³

FOR INFO ON MARINE HABs PLEASE REFER TO THE CAL HAB MONITORING AND ALERT PROGRAM (CALHABMAP)¹⁴

5 — <https://www.cdc.gov/habs/illness-symptoms-freshwater.html>

6 — <https://oehha.ca.gov/risk-assessment/fact-sheet/blue-green-algae-veterinarian-reference>

7 — <https://oehha.ca.gov/risk-assessment/document/veterinarian-outreach-letter-interagency-working-group-harmful-algal-bloom>

8 — https://mywaterquality.ca.gov/habs/resources/domestic_animals.html

9 — https://mywaterquality.ca.gov/habs/resources/habs_response.html

10 — <https://mywaterquality.ca.gov/habs/resources/index.html#drinking>

11 — <https://mywaterquality.ca.gov/habs/do/bloomreport.html>

12 — <https://mywaterquality.ca.gov/habs/do/>

13 — <https://www.epa.gov/nutrientpollution/what-you-can-do>

14 — <http://www.habmap.info/>

IDENTIFYING A HARMFUL ALGAL BLOOM (HAB)

This quick guide provides a visual comparison of appearance and color and odor that can be helpful in distinguishing non-toxic green algae and aquatic plants from potentially toxic cyanobacteria blooms or harmful algal blooms (HABs).

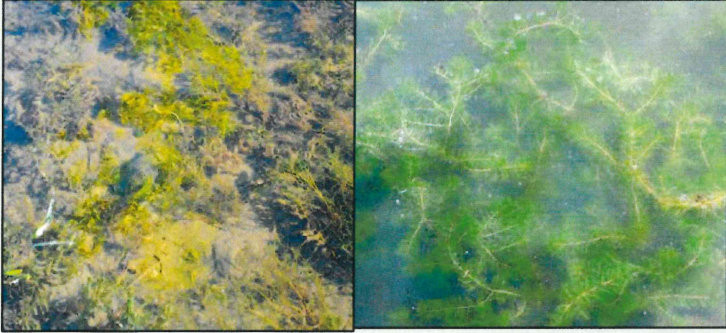
Non-toxic Algae & Plants

Cyanobacteria/HAB

APPEARANCE



Rooted Plants



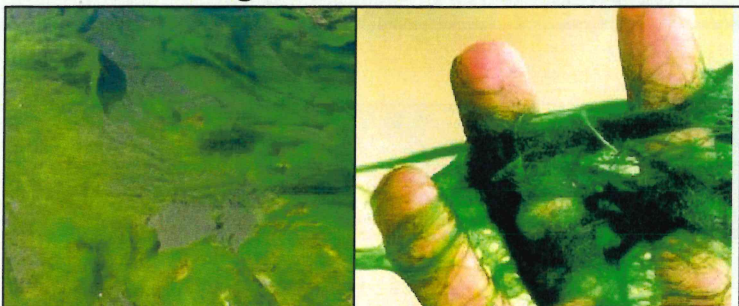
Floating Plants



Plant-like Algae



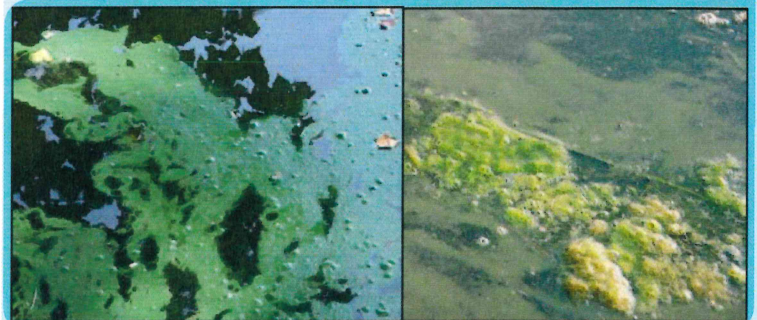
Filamentous Algae



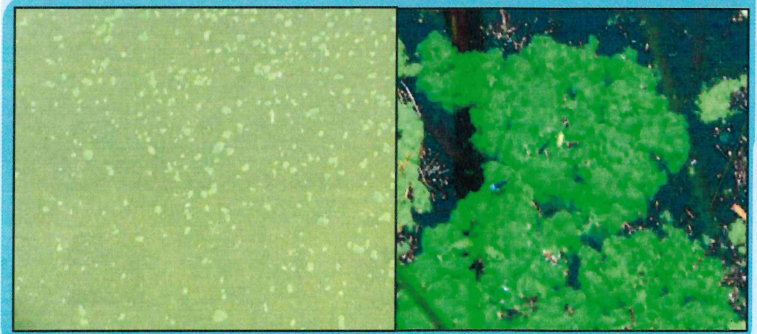
Paint or Soup



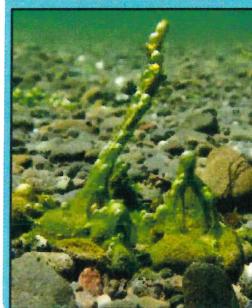
Scum, Bubbling or Spit-like Floating Foam



Lettuce or Chopped Grass



Spires



Mats



Blobs



ATTENTION: Cyanobacteria blooms/HABs can produce toxins that are harmful to humans and animals.

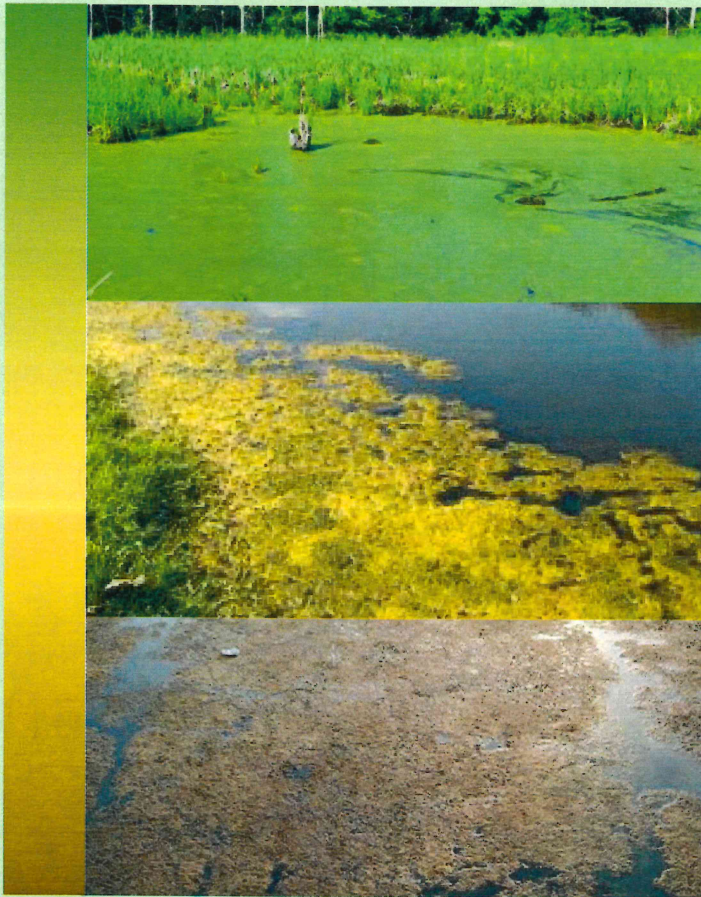
Non-toxic Algae & Plants

Cyanobacteria/HAB

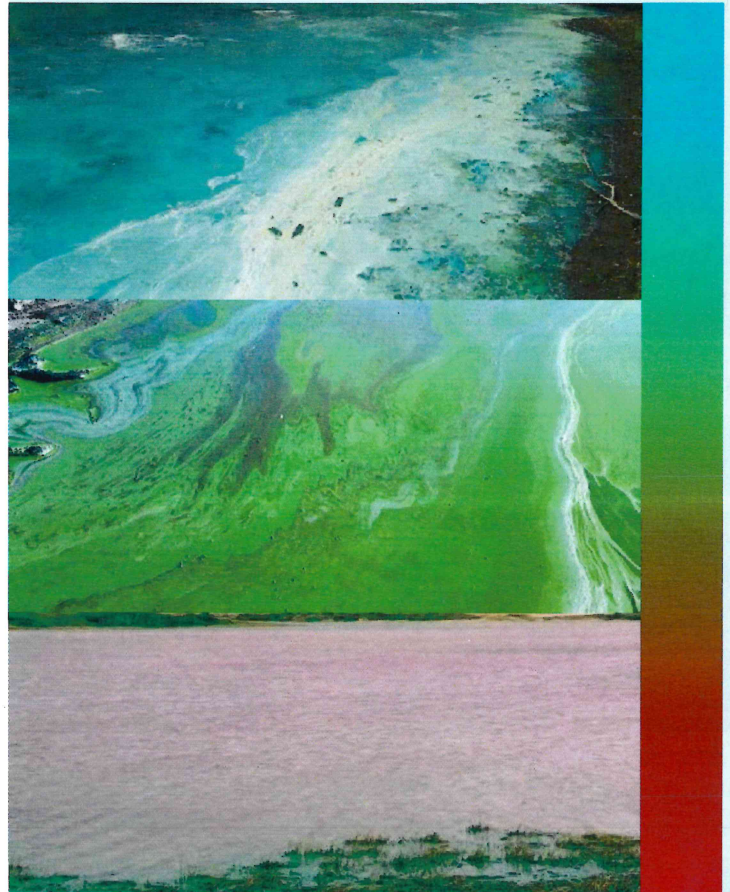
COLOR



Algae and aquatic plants are usually green but can appear yellow or brown as they die down.



Cyanobacteria get their name from their blue-green pigment but blooms can often look green, blue-green, green-brown, or red.



ODOR



Algae and aquatic plants are usually neutral or leafy in scent, but when dying or dead smell musty/rotting.



Cyanobacteria blooms can have a distinctive smell, sometimes described as gasoline, septic or fishy.

Have you seen a HAB?

Report HABs online! <http://mywaterquality.ca.gov/habs/do/bloomreport.html>

Or call 1(844) 729-6466

Find out more on the California HABs Portal <http://mywaterquality.ca.gov/habs>

Need more help with identification? <http://mywaterquality.ca.gov/habs/resources/field.html>



State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Surface Water Ambient Monitoring Program
Information Management and Quality Assurance Center

