



CCHAB Draft Updates to CyanoHAB Guidance

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Health Hazard
Assessment

Who we are ...

California CyanoHAB Network (CCHAB)

A Workgroup of the California Water Quality Monitoring Council

Government agencies; Tribal governments;
Academics, researchers and other stakeholders

Where to find us:

mywaterquality.ca.gov

- About the California Water Quality Monitoring Council
- Quick Links: Work Groups
 - California CyanoHAB Network

This group evolved out of the Statewide Blue-Green Algae Working Group – Which was established in 2006

CCHAB:

http://www.mywaterquality.ca.gov/monitoring_council/cyanohab_network/index.shtml

2010 Guidance

Draft Voluntary Statewide Guidance for CyanoHABs (2010)

For local, state, and tribal regulators

To protect people, pets, and livestock
from the effects of CyanoHABs in
recreation waters

CCHAB Webpage

→ Quick Links: Resources

→ 2010 Draft...



Draft Voluntary Statewide Guidance for Blue-Green Algae Blooms – July 2010 :

<http://www.cdph.ca.gov/HealthInfo/environhealth/water/Documents/BGA/BGAdraftvoluntarystatewideguidance-07-09-2010.pdf>

That Workgroup developed a draft Voluntary Guidance Document to help water managers and local health officials respond to toxic algal blooms. This draft document was last updated in 2010. Thresholds included in the document are based on the World Health Organization's guidelines

In 2012 the office of Environmental Health Hazard Assessment published Action Levels for common Cyanotoxins

Draft Voluntary Statewide Guidance for CyanoHABs (2010)

- Decision tree for posting signage about potential health risks
- Based on toxin concentration in water or cell density
- Includes sampling information
- Focused on microcystin



2016 Updates

2016 Draft Updates to the Voluntary Statewide Guidance

- Incorporate OEHHA's 2012 Risk Assessment
- Address additional cyanotoxins
- Expand and clarify risk management options
- Increase usability for new users

Draft Updates:

http://www.mywaterquality.ca.gov/monitoring_council/cyanoHab_network/index.shtml#resources

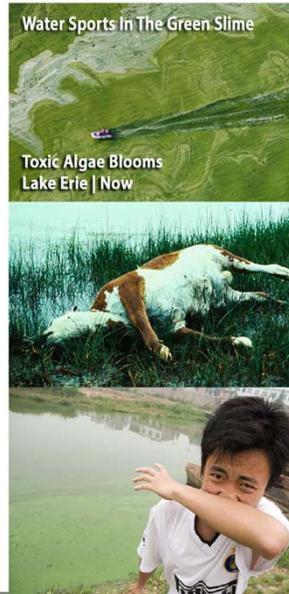
CCHAB Web Page:

http://www.mywaterquality.ca.gov/monitoring_council/cyanoHab_network/index.shtml

Core changes in draft:

- **Toxin triggers** for management action (3 cyanotoxins)
- Expanded **decision tree** with **narrative**
- Example **signage** to warn of potential health risks

CCHAB Webpage →
Resources



Draft Updates:

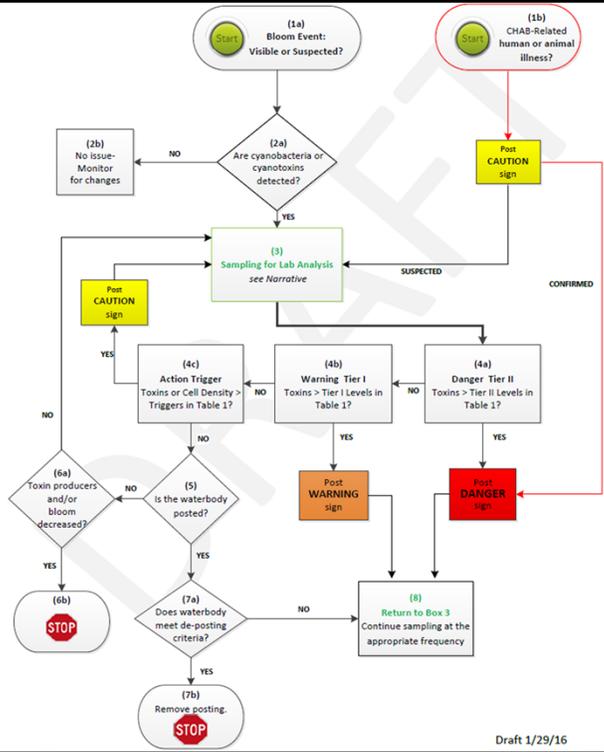
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2016 Draft Decision Tree

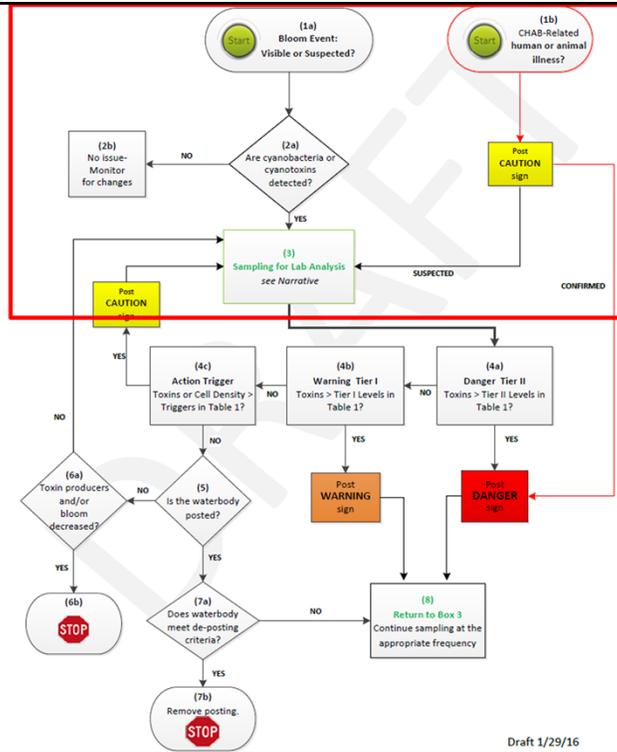
- 2 entry points
- Tiered response
- Iterative approach
- Clear exit points

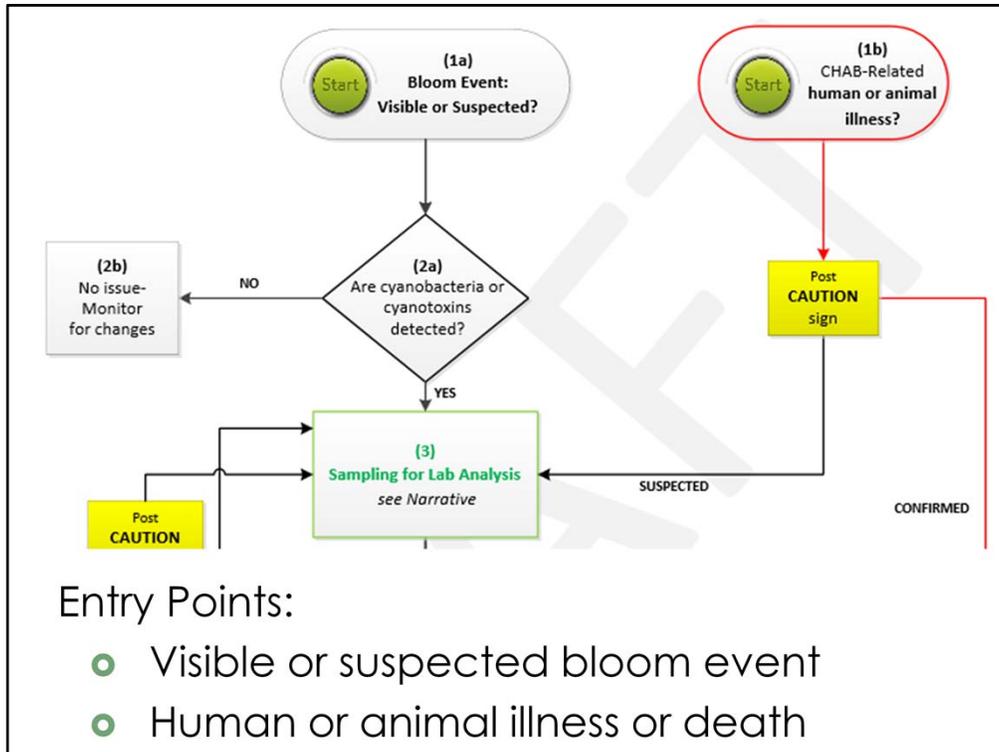


Draft 1/29/16

2016 Draft Decision Tree

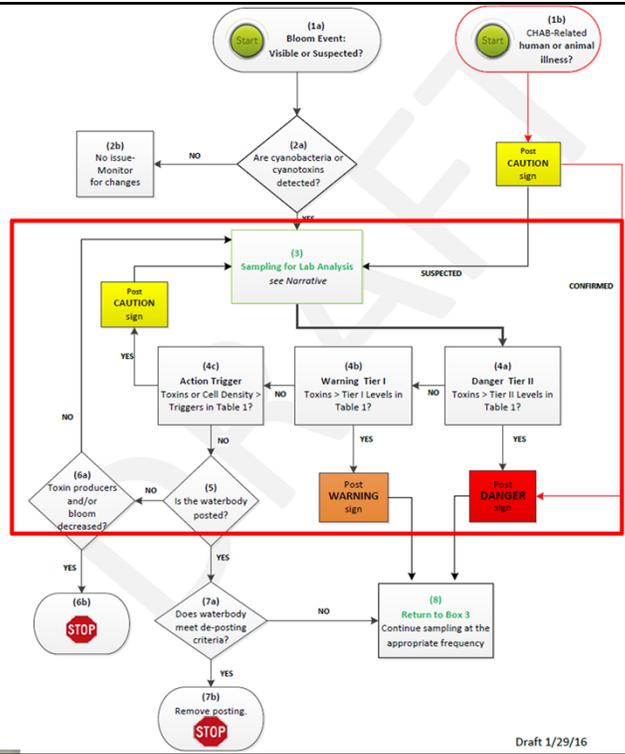
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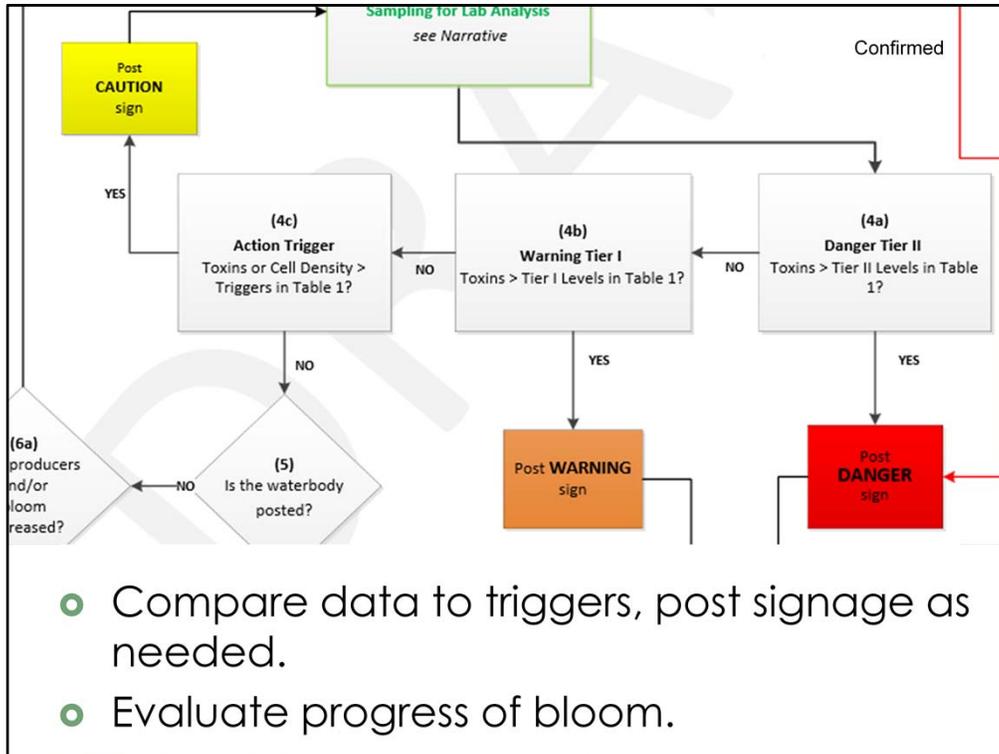




2016 Draft Decision Tree

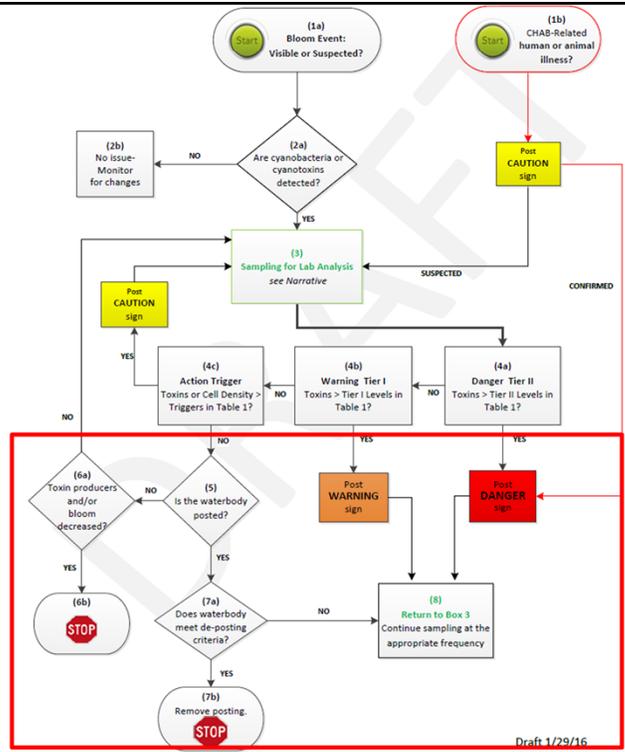
- Sampling
- Analyses
- Posting
- Re-evaluate

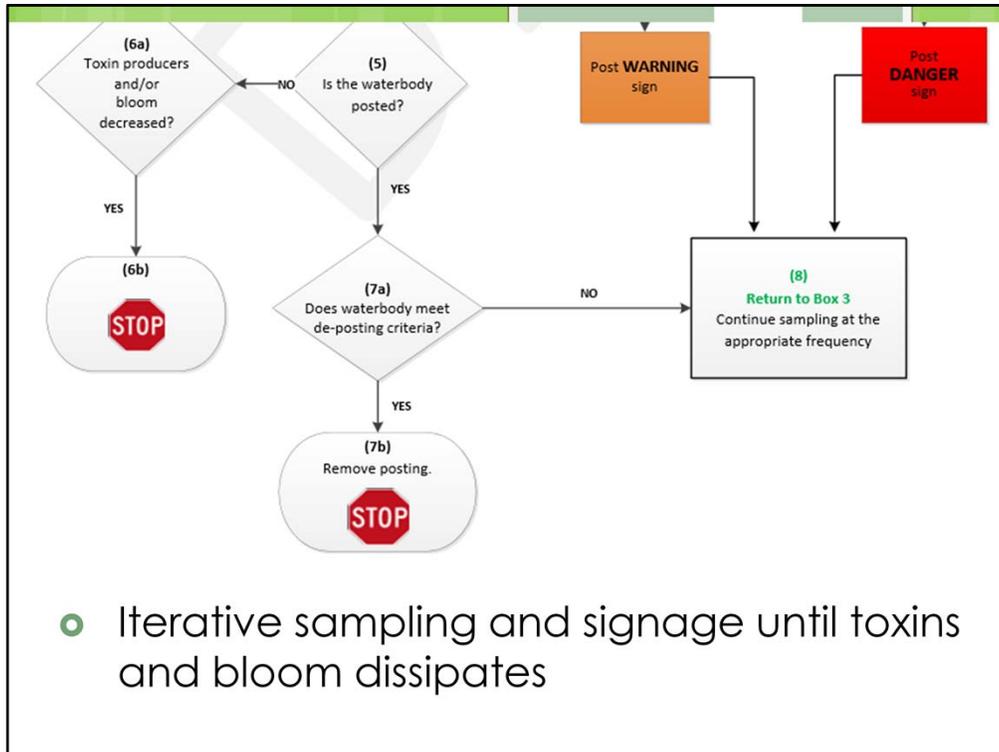




2016 Draft Decision Tree

- Iterative approach
- Sample, analyze, evaluate
- De-posting





Narrative of Decision Tree

- Succinct explanation of each step
- Refers to other sources for details
- Local interpretation and professional judgement is expected
- Voluntary guidance to assist local managers

CAUTION

**Harmful algae may be present in these waters.
For your family's safety:**



DO NOT SWIM OR WADE
near algae or scum



DO NOT let pets or livestock
go into or drink the water, or
eat scum on the shoreline.



KEEP CHILDREN AWAY
from algae in the water or
on the shore.



For fish caught here, **THROW
AWAY GUTS AND CLEAN
FILLETS** with tap water or
bottled water before cooking.



DO NOT drink this water or
use it for cooking.



DO NOT eat shellfish from
these waters.

Call your doctor or veterinarian if you or your pet get sick after going in the water.
For more information, contact:

The Caution sign points out: HABs MAY be present, for your Families safety...

WARNING

Toxins from algae in these waters can harm people and kill pets and livestock



NO SWIMMING



STAY AWAY from scum, and cloudy or discolored water.



DO NOT use these waters for drinking or cooking. Boiling or filtering will not make the water safe.



DO NOT let pets or livestock go into or drink the water, or go near the scum.



DO NOT eat shellfish from these waters.



For fish caught here, **THROW AWAY GUTS AND CLEAN FILLETS** with tap water or bottled water before cooking.

For people, the toxins can cause:

- Skin rashes, eye irritation
- Diarrhea, vomiting

For animals, the toxins can cause:

- Diarrhea, vomiting
- Convulsions and death

Call your doctor or veterinarian if you or your pet get sick after going in the water.

For more information, contact:

The big changes are:

- Take out the “May be present” because they are present
- “No Swimming” rather than “Don’t swim or wade near algae or scum”
- and the addition of symptoms.

DANGER

Toxins from algae in these waters can harm people and kill pets and livestock



STAY OUT OF THE WATER UNTIL FURTHER NOTICE. Do not touch scum in the water or on shoreline.



DO NOT let pets or livestock drink or go into the water or go near the scum.



DO NOT eat fish or shellfish from these waters.



DO NOT use these waters for drinking or cooking. Boiling or filtering will not make the water safe.

For people, the toxins can cause:

- Skin rashes, eye irritation
- Diarrhea, vomiting

For animals, the toxins can cause:

- Diarrhea, vomiting
- Convulsions and death

Call your doctor or veterinarian if you or your pet get sick after going in the water.
For more information, contact:

Additions are “Stay out of the Water” and “Do not eat fish”.

In the future we can add QR codes and web links that can take people to sites where they can get more information on cyanotoxins and the threat to health in their area.

Table 1. CyanoHAB Trigger Levels for Human Health

	Caution Action Trigger	Warning TIER 1	Danger TIER 2
<i>Primary Triggers</i> ^a			
Total Microcystins ^b	0.8 µg/L	6 µg/L	20 µg/L
Anatoxin-a	Detection ^c	20 µg/L	90 µg/L
Cylindrospermopsin	1 µg/L	4 µg/L	17 µg/L
<i>Secondary Triggers</i>			
Cell Density	4,000 cells/mL	--	--
Site Specific Indicators	Blooms, scums, mats	--	--

- a. The primary triggers are met when ANY toxin exceeds criteria
- b. Microcystins refers to the sum of all measured microcystin variants. (See Box 3)
- c. Must use an analytical method that detects $\leq 1\mu\text{g/L}$ Anatoxin-a

Cyanotoxin Triggers for Action

	2010		2016	
Toxin	Conc. (µg/L)	Public health action	Conc. (µg/L)	Public health action
MC	≥8	Advisory sign	0.8*	Caution sign
			6	Warning sign
			20	Danger sign
ANA-α	detect	Advisory sign	detect	Caution sign
			20	Warning sign
			90*	Danger sign
CYN	-	-	1	Caution sign
	-	-	4*	Warning sign
	-	-	17	Danger sign

* OEHHA action level for protection of human health

OEHHA Action Levels

- For ongoing, repeated **exposures over weeks to years**
- **Animal study** → MC dose where adverse impacts begin to appear (**POD**)
- **Uncertainty Factors:**
 - Animals → humans
 - Average → sensitive human
 - Incomplete data
- **Safe Dose in Humans: $POD \div UF$**

OEHHA Action Levels

- **Exposure estimate**
 - Child swimming in recreational waters
5 hrs each day
- **Action Level:**
 - Safe Dose in Humans
 - Exposure to Recreational Water
 - *Cyanotoxin Concentration in Water*
- **Conservative Assumptions**

Microcystin

Basis	Trigger (µg/L)	POD (µg/kg-d)	Total UF	Exposure	Study / Endpoint
CAUTION: OEHHA's Action Level	0.8	6.4 ^b	1000	5 hrs/day (250 ml)	Heinze 1999 / Liver Impacts
WARNING: Modified OEHHA AL ^a	6	6.4 ^b	300^c	2 hrs/day (100 ml)	Heinze 1999 / Liver Impacts
DANGER: Risk Management	20	--	--	--	--

^a OEHHA's BMDL with UF = 300 and lower exposure.

^b Calculated BMDL for liver impacts from Heinze (1999) data.

^c The UF is lower because a factor of 3 was used to account for limited database.

Anatoxin-a

Basis	Trigger (µg/L)	POD (µg/kg -d)	Total UF	Exposure	Study / Endpoint
CAUTION: Precautionary Approach	Detect	--	--	--	--
WARNING: OHA's Guideline	20	100	1000	2 hrs/day (100 ml)	Fawell et al. 1999 / Neurotox
DANGER: OEHHA's Action Level	90	2,500	1000	5 hrs/day (250 ml)	Fawell et al. 1999 / Neurotox

OHA: Oregon Health Authority

Cylindrospermopsin

Basis	Trigger (µg/L)	POD (µg/kg -d)	Total UF	Exposure	Study / Endpoint
CAUTION: Precautionary Approach	1	--	--	--	--
WARNING: OEHHA's Action Level	4	33 ^b	1000	5 hrs/day (250 ml)	Humpage & Falconer 2003 / Kidney Impacts
DANGER: Modified OEHHA AL ^a	17	33 ^b	600 ^c	2 hrs/day (100 ml)	Humpage & Falconer 2003 / Kidney Impacts

^a OEHHA's BMDL with UF = 600 and lower exposure.

^b Calculated BMDL for kidney impacts from Humpage & Falconer (2003) data.

^c The UF is lower because a factor of 6 was used to account for limited database.

Join us . . .

Next Steps

- CCHAB Network Meeting: April 13, 2016
- Work with the CCHAB Network to complete the update to the Voluntary Guidance Document (2016)



CCHAB Web Page:

http://www.mywaterquality.ca.gov/monitoring_council/cyanohab_network/index.shtml

Contact us . . .

Questions and Comments



For questions contact:

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