

Colorado's collaborative approach to address harmful algal blooms

ASDWA webinar | July 24, 2023

David Dani, Colorado Department of Public Health and Environment



COLORADO
Department of Public
Health & Environment

Colorado Harmful Algal Bloom Workgroup

- Created to help Colorado water providers with a consistent approach to EPA's 2015 cyanotoxin drinking water 10-day health advisories
- Included utilities, industry, organizations, universities, experts
- Resources to help large and small water providers
 - Guidance, trainings, troubleshooting, lab support, data sharing




Drinking water monitoring and response guidance

5 Steps

1. Do you have a bloom?
2. Is it cyanobacteria?
3. Do you have toxins in your raw water?
4. Do you have toxins in your finished water?
5. Are lab results above the health advisory?



 **COLORADO**
Water Quality Control Division
Department of Public Health & Environment

April 2016

Harmful algal bloom monitoring guidance

For Colorado drinking water providers using surface water - from the Colorado Harmful Algal Bloom Workgroup.

Visually inspect source waters for algae blooms at least weekly during bloom season (typically late summer through early fall). Test and take events, filter or filter run, and change in source water quality may indicate the presence of a bloom. Before bloom season starts, be prepared and order cyanobacteria immunologic and cyanotoxin (microcystin) field tests, evaluate source and treatment options, and develop a monitoring, response, and communication plan.

Step 1: Observe and prepare:

- "If bloom observed continue to step 2.

Step 2: Field screen for blue-green algae:

- Immediately after observing bloom use microscopic examinations or phytoplankton analysis if available or use jar and disk tests¹ and field identification guide² for presence of blue-green algae which could produce cyanotoxins. Continue examinations at least weekly during presence of bloom.
- "If blue-green algae are present continue to step 3.

Step 3: Field screen for toxins present in raw water:

- Monitor raw water intake for presence of cyanotoxins using a field test for source drinking water (e.g., Microcystin Test) immediately after identifying blue-green algae and then at least weekly during presence of blue-green algae. You can use a field test for filtered drinking water if you freeze then than sample 3 times to release toxins within octa prior to analysis. Evaluate source and treatment options, identify and contact help in advance about sampling procedures and sample turnaround time in case toxins are detected in finished water.
- "If microcystin and/or cylindrospermopsin are present in raw water continue to step 4.

Step 4: Field screen for toxins present in finished water:

- Monitor finished water at entry point for presence of the cyanotoxins detected in raw water using a field test for finished drinking water (e.g., Algae's Strip Test) immediately after detecting cyanotoxin presence in raw water and then at least weekly during cyanotoxin presence in raw water. Evaluate source and treatment options, notify utility management about a response and communication plan in case cyanotoxins are present in the finished water above EPA's health advisory values.
- "If microcystin and/or cylindrospermopsin are present in finished water continue to step 5.

Step 5: Quantitative lab analysis for toxins in finished water:

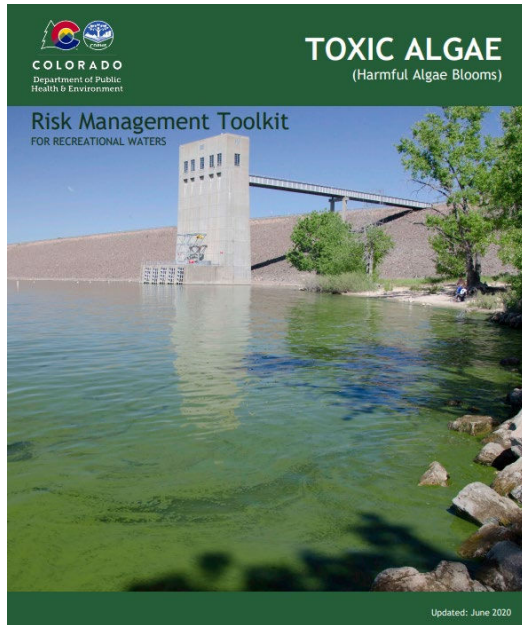
- Send finished water sample (after quenching chlorine residual) to lab for quantification of the cyanotoxins detected in finished water immediately after detecting cyanotoxin presence in finished water and then at least weekly during cyanotoxin presence in finished water. Evaluate source and treatment options.
- "If microcystin values are above 0.3 µg/L and/or cylindrospermopsin values are above 0.7 µg/L (EPA's health advisory values), consult CDPHE (1-877-518-5688) so they can assist. Take a confirmation sample of the finished water within 24 hours and send to lab. If confirmation sample results are above health advisory values, follow utility response and communication plan and notify consumers. Consider monitoring for taste or taste-potential throughout distribution to look for foam development and extent of impacted areas using a field test for finished drinking water. Notify consumers that water returns to acceptable levels after at least 2 consecutive finished water samples are below EPA's health advisory levels.



Toolkit for recreational water managers

- Collaboration: CO Parks and Wildlife, Toxicology, Water Quality



Advisory value (µg/L)	Microcystin	Cylindrospermopsin	Anatoxin	Saxitoxin
No Contact Advisory (post “DANGER” signage)	8	15	15	8




DANGER

LAKE IS CLOSED TO FULL-BODY CONTACT

Toxic algae is present!



Fishing permitted - rinse fish with clean water and properly dispose guts
Boating permitted - avoid algae

Water contact can cause illness

- ▶ Keep kids out
- ▶ No pets in water (death may occur)
- ▶ Do not drink water
- ▶ No water recreation (swimming, skiing, paddle-boarding, wading, etc.)
- ▶ If exposed, shower immediately

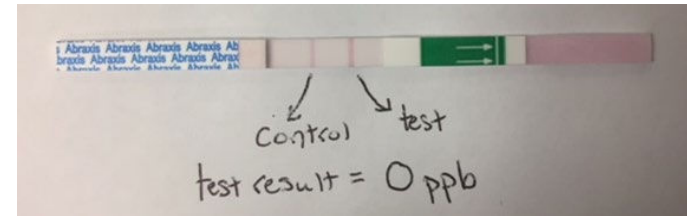
If you or your animals have nausea, vomiting, diarrhea, rash, irritated eyes, seizures or breathing problems, call Poison Control: **1-800-222-1222**



COLORADO
Department of Public
Health & Environment

Coordinated response and assistance

- ToxCall hotline receives algal bloom call
 - Poison control, dead dog report, taste and odor complaint, media, EPA inquiry
- Assess and notify drinking water program, clean water program, toxicology, Parks and Wildlife designated contacts
- Coordinate and follow up with caller and assist waterbody manager
 - Guidance on next steps
 - Assess waterbody
 - Provide test strips and training
 - Help with response plans
- Coordinate with state lab for testing
 - EPA may help with quick turnaround



Collaborate on website information and resources

<https://cdphe.colorado.gov/toxic-algae>

Toxic algae in Colorado

Algae is common and natural to our waters in Colorado. But some algae can multiply rapidly, form blooms or scums, and create toxins that can harm people, animals, and the local environment.



When in doubt, stay out!

Don't go in the water if toxic algae is present.



- No swimming or wading in toxic algae.
- Keep kids and animals away from the water. Don't let them eat or play with toxic algae.
- Don't drink water that may contain toxic algae.
- Boating permitted: avoid areas with toxic algae.
- Clean fish well & discard guts appropriately.

Toxic algae can

- Make the water look green, turquoise, gold, or red.
- Look like thick pea soup or spilled paint on the water's surface.
- Be made up of small specks or blobs floating at or just below the water's surface.

Toxic algae is typically not

- Stringy in appearance.
- Mustard yellow in color (this likely is pollen).

Learn more

- For questions about the health effects of toxic algae, call poison control at 1-800-222-1222.
- For more information about toxic algae, visit [CDPHE's Toxic Algae website](#).


Exposed?

Shower immediately. See a doctor or vet if symptoms occur.



Symptoms

 <h4>Pets</h4> <ul style="list-style-type: none">• drooling• diarrhea• vomiting• low energy• not eating• stumbling• tremors	 <h4>People</h4> <ul style="list-style-type: none">• skin irritation, rashes• nausea, vomiting• diarrhea, stomach cramps• fever, headache, sore throat• liver damage• allergic reactions• asthma flareups
--	--




Toxic Algae (Harmful algae blooms)

Frequently Asked Questions

1. What is toxic algae?


Toxic algae or harmful algae blooms are made up of what many people call blue-green algae. Technically, these organisms are a special type of bacteria called cyanobacteria or cyanobacteria. Although these organisms naturally occur in Colorado waters, they become a problem when they multiply rapidly, resulting in a dense cyanobacteria concentration or "bloom". The blooms become harmful when the cyanobacteria produce toxins.



2. What causes toxic algae?

Blooms tend to occur when the ecosystem gets out of balance and the cyanobacteria are able to outcompete other phytoplankton. Excess nutrients, high temperatures, and standing or slow-moving water provide an optimal environment for cyanobacteria to reproduce. The peak season for toxic algae is during the hot summer months of June to September.

3. What should I look for?



Toxic algae may resemble thick pea soup, spilled paint on the water's surface, and/or create a thick mat of foam along the shoreline. Toxic algae is generally green, red, gold, or turquoise. You may also see small specks or blobs floating at or just below the water surface. Toxic algae is typically not stringy or mustard yellow in color (the latter is probably pollen).

4. Can I tell if a bloom is toxic by looking at it?

No. Laboratory testing or test strips are necessary to confirm the toxin levels. If you suspect toxic algae, the best advice is to avoid contact with the water until laboratory testing or test strips confirm the absence of or a safe level of toxins. See question number 5 below for more information about testing for algae.



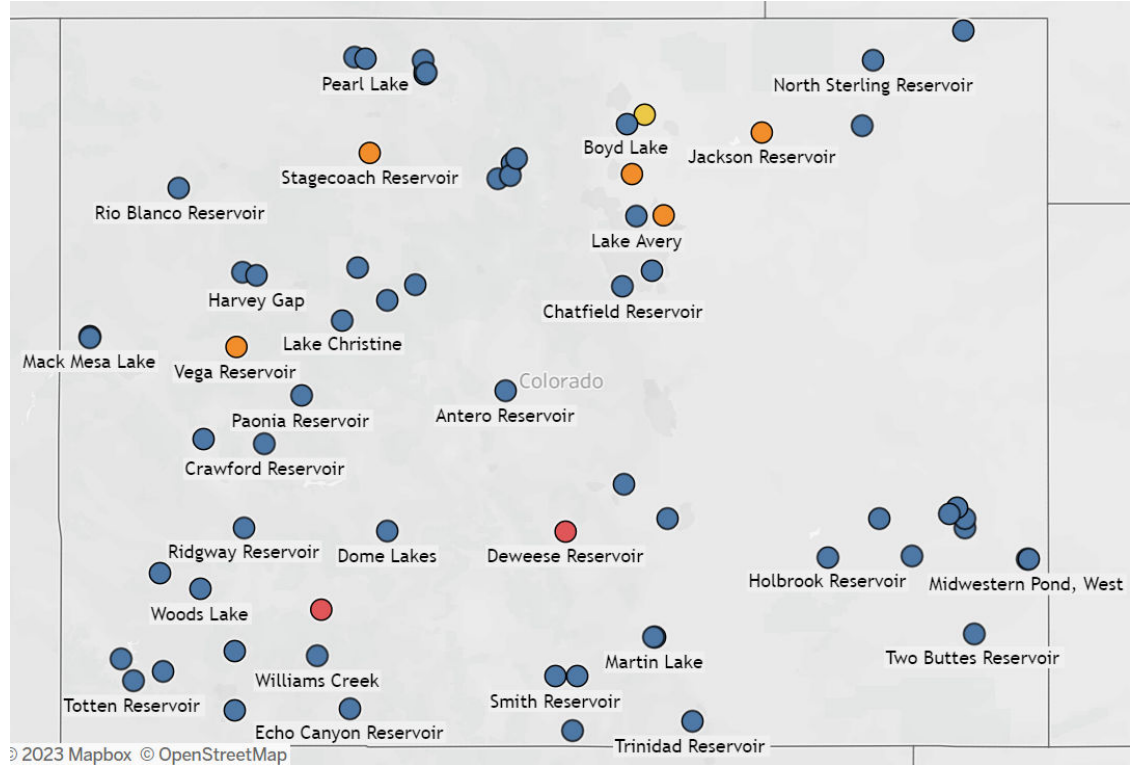
Map of recent conditions

Waterbody name

(All)

Condition Category

- No bloom reported
- Caution
- Warning
- Third party



Coordination importance and challenges

- Increased public awareness and expectations
 - Calls about golf course, stormwater, private ponds, ditches
- Limited resources and not regulated
- Terminology consistency: harmful algae blooms, HCBs, cyanoHABs, cyanobacteria, blue-green algae, toxic algae
- Can be confusing to explain: Not all blooms produce toxins, toxins can be present without a visible bloom
- Need for coordinated education: “when in doubt, stay out!”, pet owners, how people can help reduce nutrients
- Encourage caution not panic
- Keeping momentum in off-season





Thank you!

David Dani

david.dani@state.co.us

cdphe.colorado.gov/toxic-algae



COLORADO
Department of Public
Health & Environment