Harmful Algal Blooms (HABs) in Montana

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9 HABs Principles

1. A HAB is a mass of cyanobacteria

   Not truly algae, but rather blue-green algae, subset of phytoplankton, a single-celled algae.

2. Cyanobacteria are common

   Native constituents of freshwater, estuarine, and marine environments

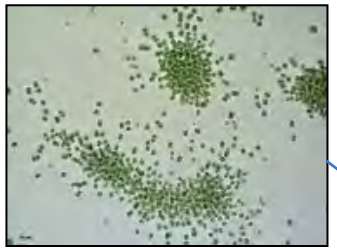
9 HABs Principles

3. Cyanobacteria can be toxic

- Liver, nerve, or skin toxins (cyanotoxins)
- Toxins are selectively produced by many genera—but not very predictable
- Widely distributed but not often at acutely toxic levels
- Exposure routes include ingestion, inhalation, and skin contact

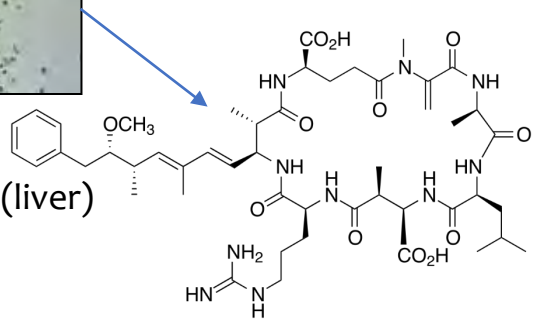
Anabaena or Dolichospermum

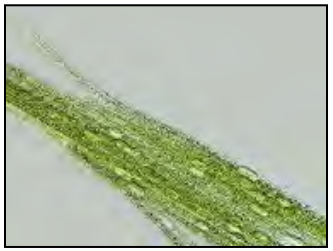
- Microcystins (liver)
- Anatoxin-a/a(s) (nerve)
- Saxitoxins (nerve)



Microcystis

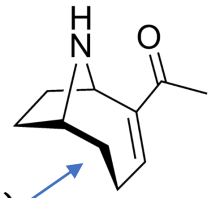
- Microcystin (liver)





Aphanizomenon

- Anatoxin-a (nerve)
- Cylindrospermopsins (liver)
- Saxitoxins (nerve)



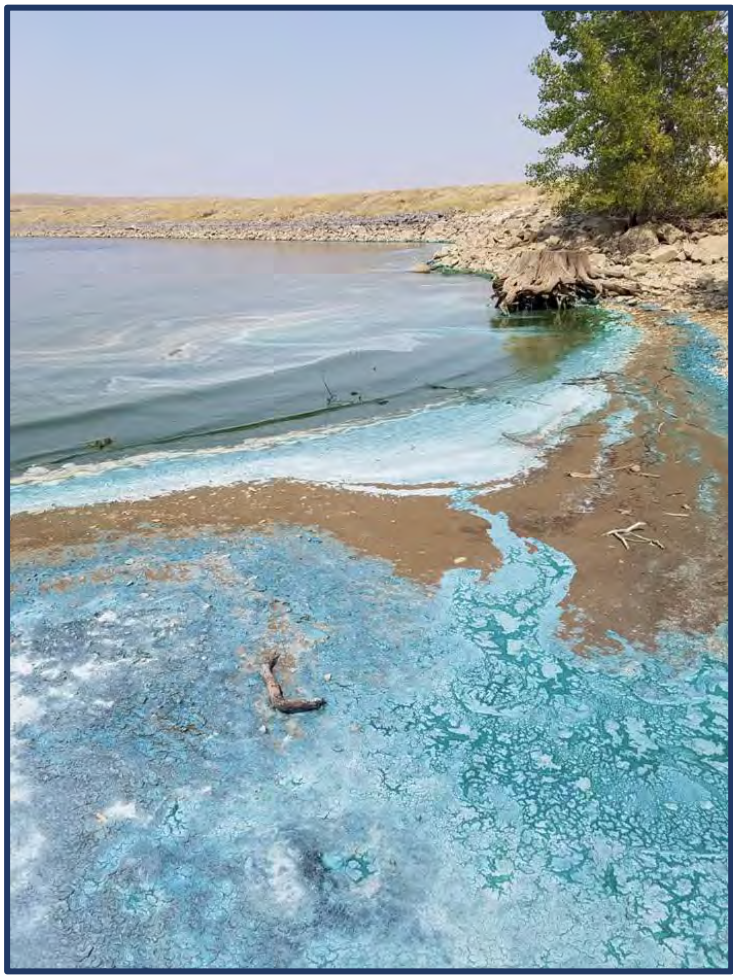
9 HABs Principles

4. Climate change effects HAB growth

- HABs have been observed with increasing frequency and in more locations in US
- Warmer waters results in more extensive HABs lasting into the early winter months

5. Human activities are responsible for increase

- Increased nitrogen and phosphorus from sewage treatment, animal feeding operations, runoff from agricultural fields, roads and stormwater



9 HABs Principles

6. No EPA *standards* for cyanotoxins

EPA DRINKING WATER *GUIDANCE*

Cyanotoxin	Drinking Water Health Advisory (10-day)	
	Bottle-fed infants and pre-school children	School-age children and adults
Microsystins	0.3 µg/L	1.6 µg/L
Cylindrospermopsin	0.7 µg/L	3 µg/L

EPA RECREATIONAL *GUIDANCE*

Microcystins	Cylindrospermopsin
8 µg/L	15 µg/L

9 HABs Principles

7. You can't tell toxicity by just looking—blooms can be deceiving!

9 HABs Principles

8. Pets, livestock, and wildlife deaths reported
   - No human deaths attributed to cyanotoxins in the US

9. When in doubt, stay out
   - Do not drink, swim, touch, or inhale water affected by cyanobacteria
   - If you, your child, or your pet does go in water that has a bloom, wash off immediately with tap water

Montana's State HAB Program

- Primary goal: the public is aware of HABs, the health risk posed, how to identify them, and how to help prevent their prevalence.
- Launched July 2017- Online HAB reporting system
- Developing **effective communication** with managing jurisdictions

HAB.mt.gov

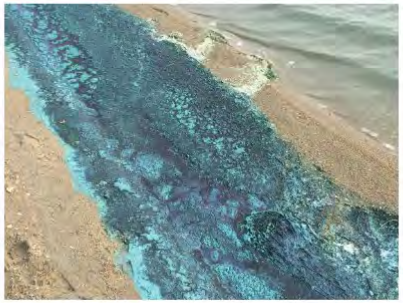
dphhs.mt.gov/publichealth/Epidemiology/hab/

Public Health & Safety / Epidemiology / HAB / Harmful Algal Blooms

Public Health & Safety: Harmful Algal Blooms

Click to Report and Track a Possible Harmful Algal Bloom

These are public reports of algal blooms. Reports do not represent a comprehensive list of all HABs. Therefore, this map does not show the full potential of waterbodies experiencing blooms, nor can we accurately know the health risk at any given time. Advisories (caution or closure) are issued by experts, but it is impossible to keep the status of each report perfectly up to date. Toxin production may occur or dissipate at any moment. Please use your best judgment to determine if a bloom is in the area, and **if in doubt, stay out.**



- **What are Harmful Algal Blooms (HABs)**
- **FAQ**
- **HABs Guidance and Advisory Signs**
- **Videos and Resources**

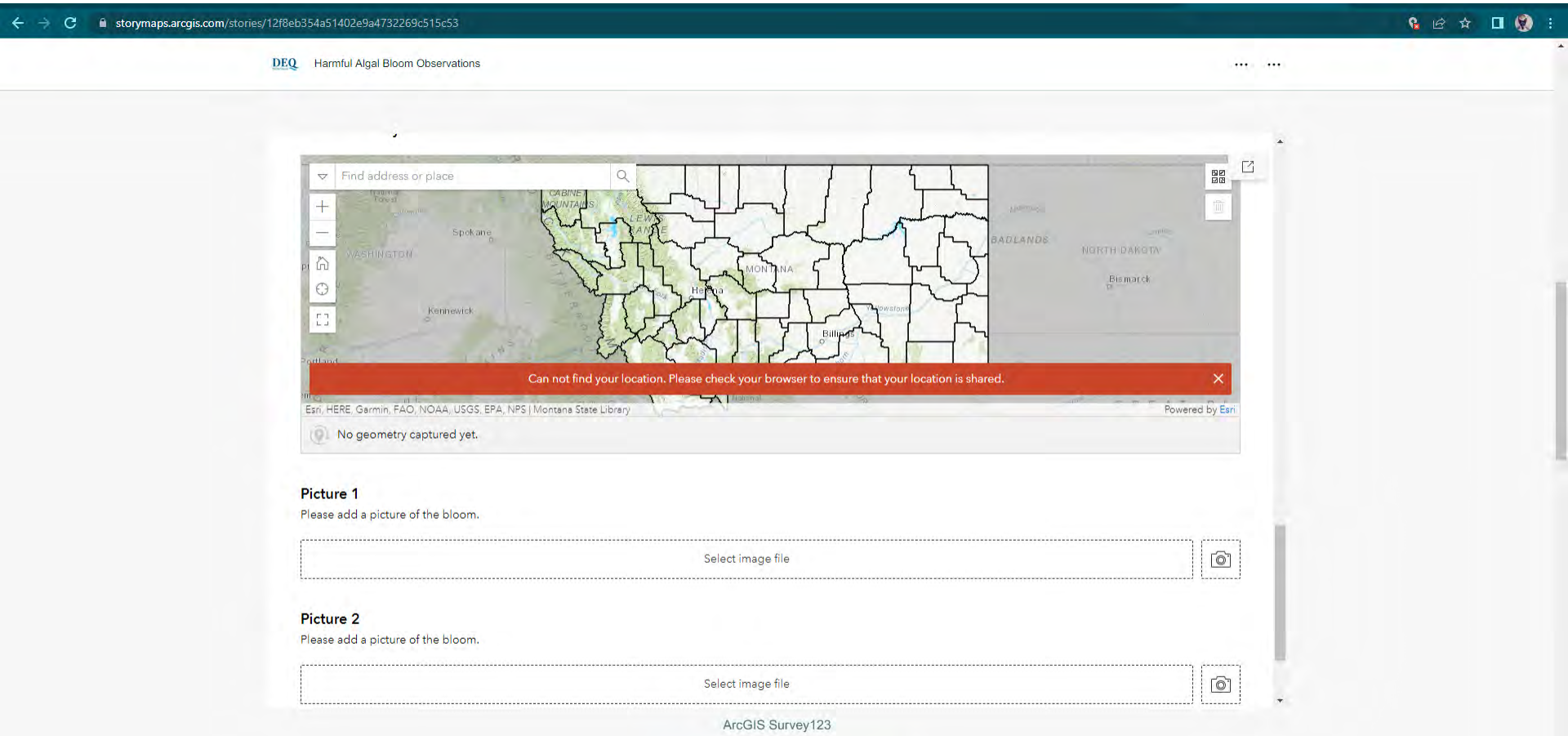
Think you or an animal have been exposed to a HAB?

- Talk to your health provider or veterinarian
- Call poison control 1-800-222-1222
- Call animal poison control 1-888-426-4435 (fee based)

Think you see a HAB?

- Submit a Report Online
- Call 1-888-849-2938; or
- Email HAB@mt.gov

HAB.mt.gov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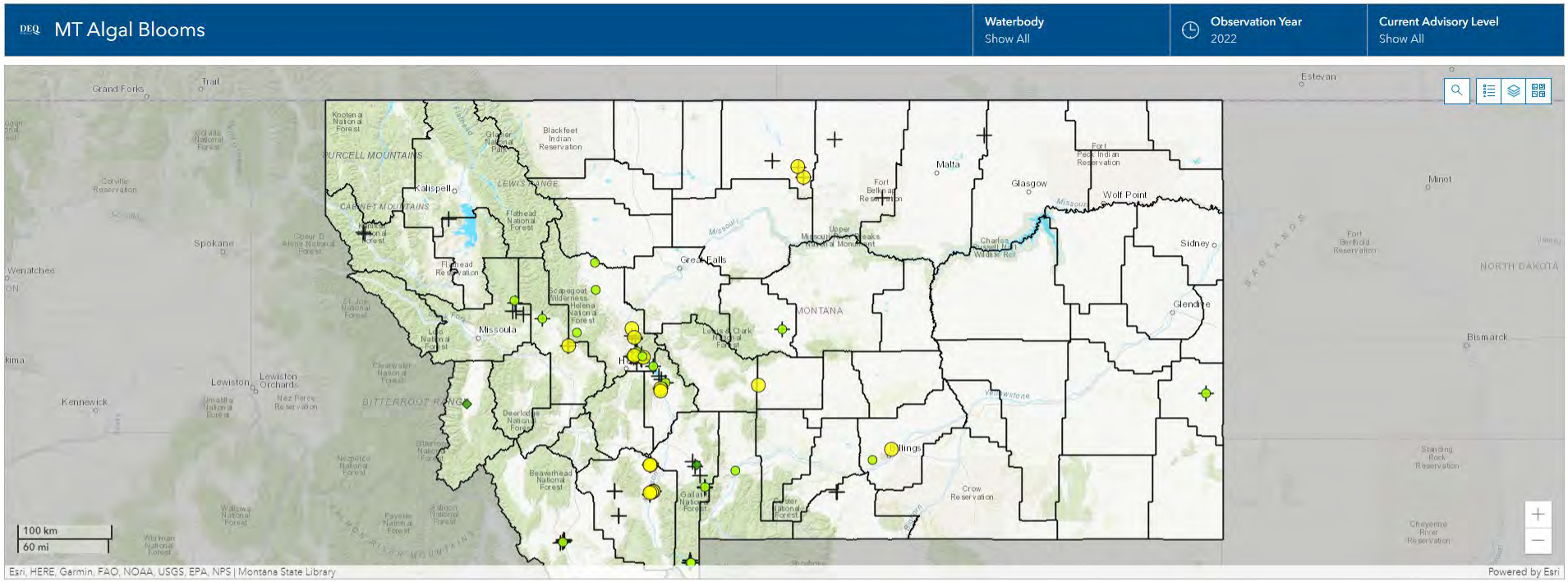
DEQ
Harmful Algal Bloom Observations
Find address or place
Spokane
WASHINGTON
Kennewick
MONTANA
Helena
Billings
BADLANDS
NORTH DAKOTA
Bismarck
Can not find your location. Please check your browser to ensure that your location is shared.
Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | Montana State Library
Powered by Esri
No geometry captured yet.
Picture 1
Please add a picture of the bloom.
Select image file
Picture 2
Please add a picture of the bloom.
Select image file
ArcGIS Survey123

HAB.mt.gov

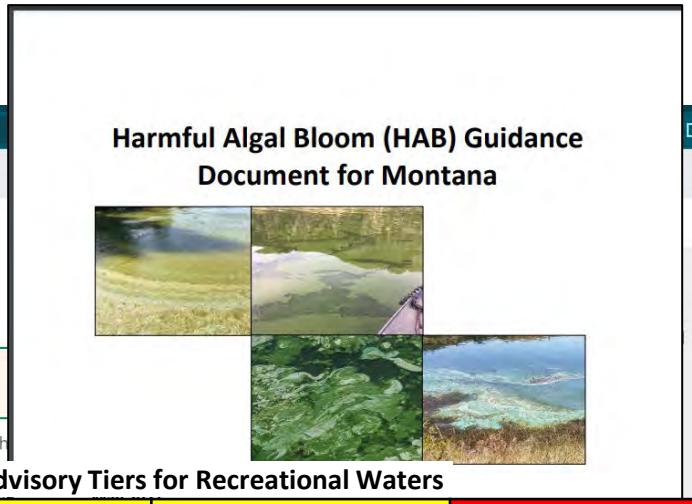
(As of 09/12/2022)



Recent Observations

- Ennis Lake - 9/6/2022 (Caution)
- Harrison lake - 9/2/2022 (Caution)
- Beaver Creek Reservoir - 8/31/2022 (Caution)
- Ennis Lake - 8/30/2022 (Caution)
- Ennis Lake - 8/30/2022 (Caution)
- Martinsdale Reservoir - 8/30/2022 (Caution)
- Canyon Ferry - 8/29/2022 (Caution)
- Ennis Lake - 8/23/2022 (Caution)

HAB.mt.gov



dphhs.mt.gov/publichealth/Epidemiology/hab/

Public Health & Safety / Epidemiology / HAB / Harmful Algal Blooms

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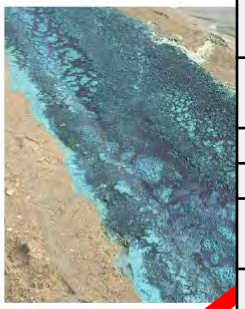

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- FAQ
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- Videos and Resources

Table 2. Montana HAB Public Health Advisory Tiers for Recreational Waters

	Tier 1: Caution	Tier 2: Caution	Tier 3: Consider Closure
Relative Probability of Acute Health Effects[1]	Low	Moderate	High
Cyanobaceterial Cell Density (cells/mL)[1]	<20,000	20,000 – 100,000	>100,000
Microcystins (ug/L)[1,2]	<8	8 – 24	>24
Anatoxin-a (ug/L)[3]	Non-Detect	Detect – 20	> 20
Additional Factors	Visual presence but no reported illness	Reports of animal illness or death	Reports of human illness
Health Risks[1]	Negligible	Short-term effects such as skin irritation nausea, vomiting, diarrhea. Potential for long-term effects.	Short-term effects such as skin irritation nausea, vomiting, diarrhea. Potential for long-term effects and acute poisoning.
Recommended Actions	Post caution signs, visually monitor for changes	Post caution signs, notify private water users and media with advisory	Post closure signs, notify private water users and media with advisory, closures

HAB Monitoring Resources

Monitoring is not mandated but recommended

1. Visual (via photograph)
2. Field test strips
3. Laboratory Analysis (water sample under microscope)

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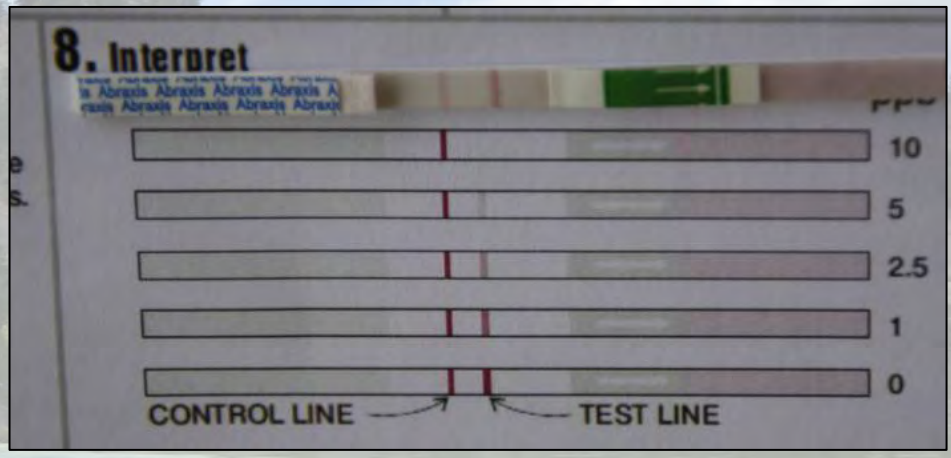
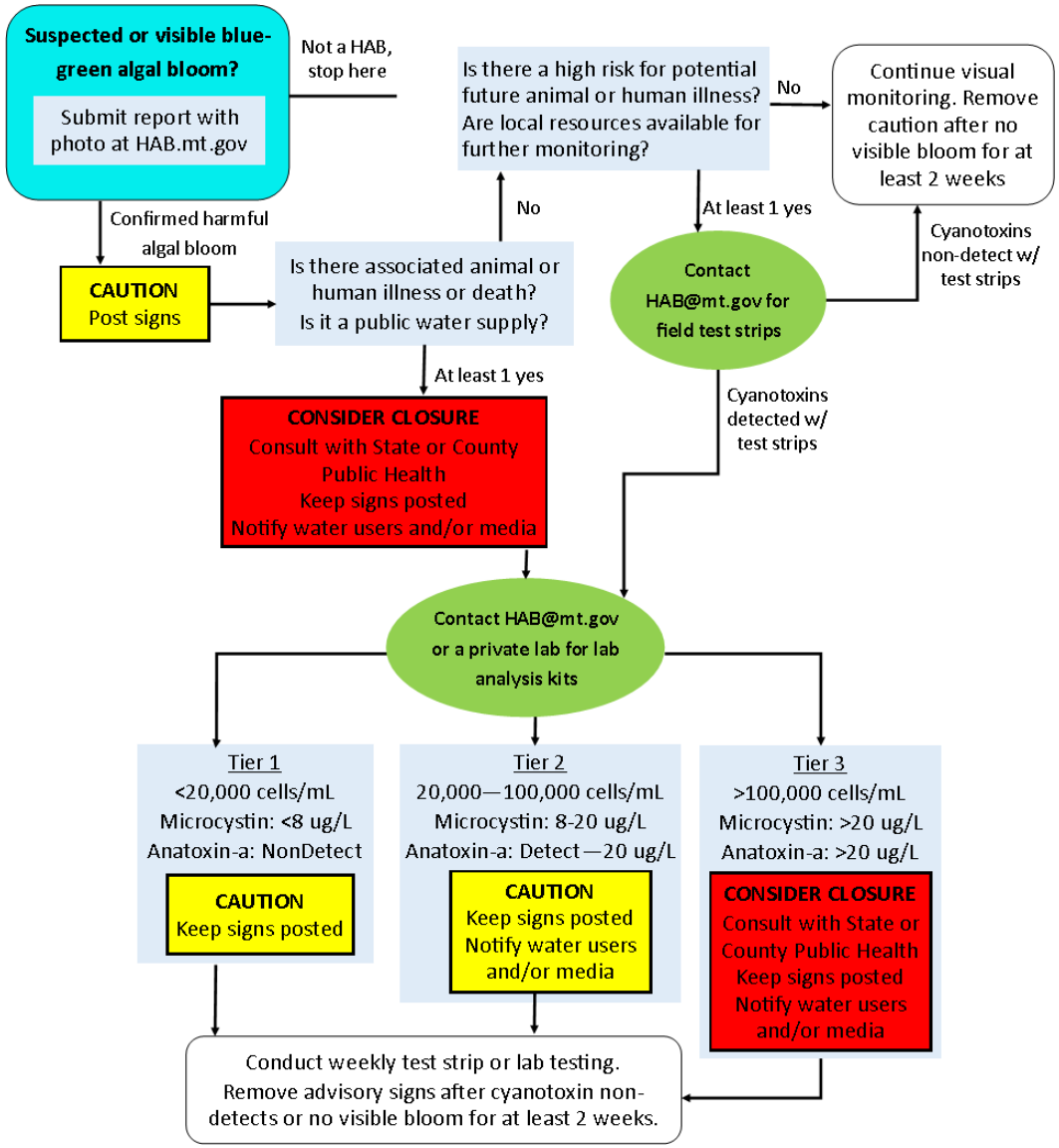
Water sample kits sent to EPA-Denver (48 hours turn-around once received)



Semi-quantitative results within 1 hr

Figure 3. Decision Flow Chart for Harmful Algal Blooms in Recreational, Publicly Accessed Waters



DEQ MONTANA

WELCOME TO

Canyon Ferry

Harmful algal blooms commonly occur on Canyon Ferry. Water may be unsafe for people and pets.

Avoid all contact with water that :

- Looks like spilled paint or pea soup
- Is discolored green and/or blue
- Has globs, surface films or scum

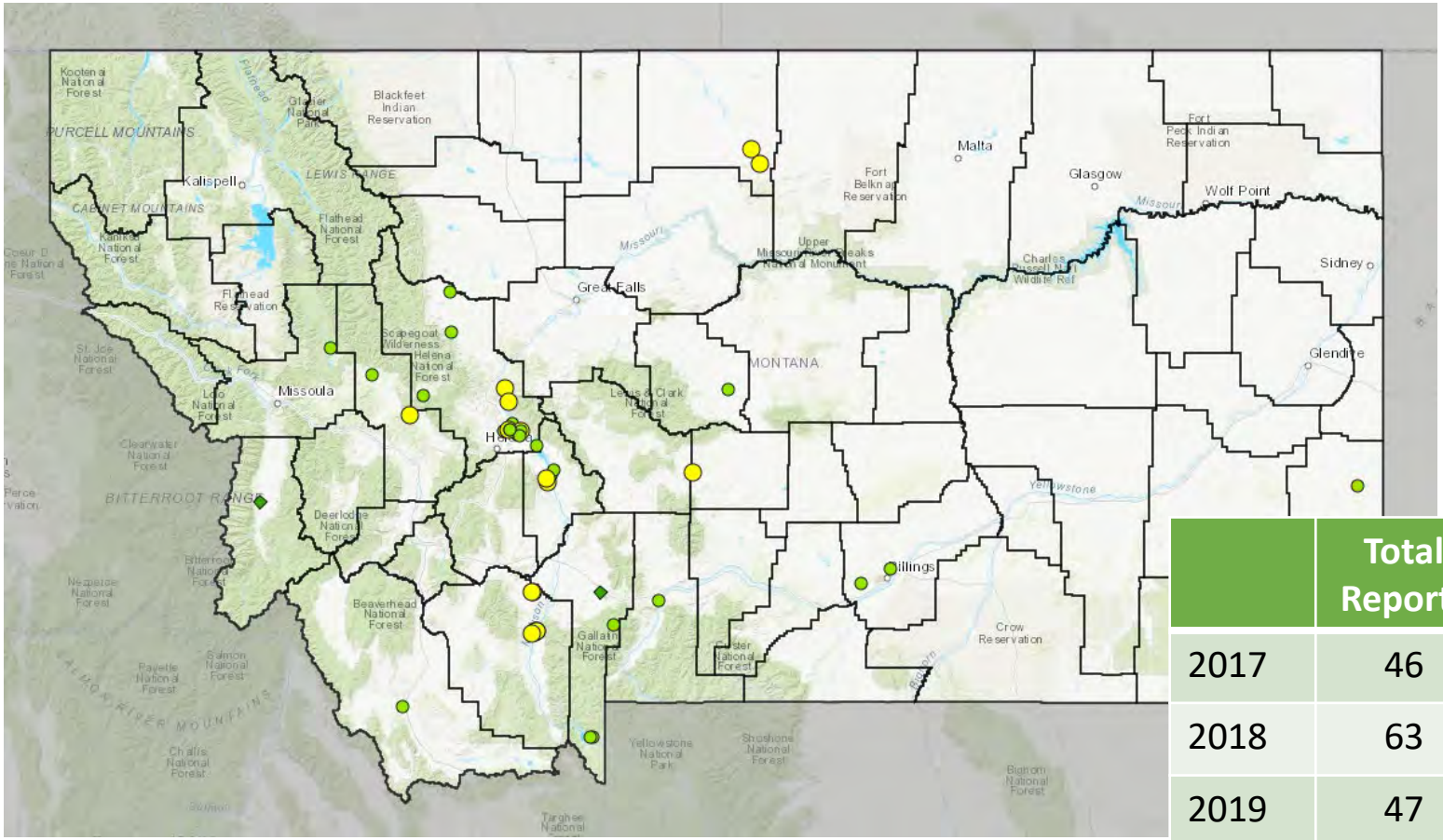
Submit photo reports and learn more information by visiting **HAB.mt.gov**

DEQ

MONTANA DPHHS

Advisory Level: Caution

2022 HAB season recap

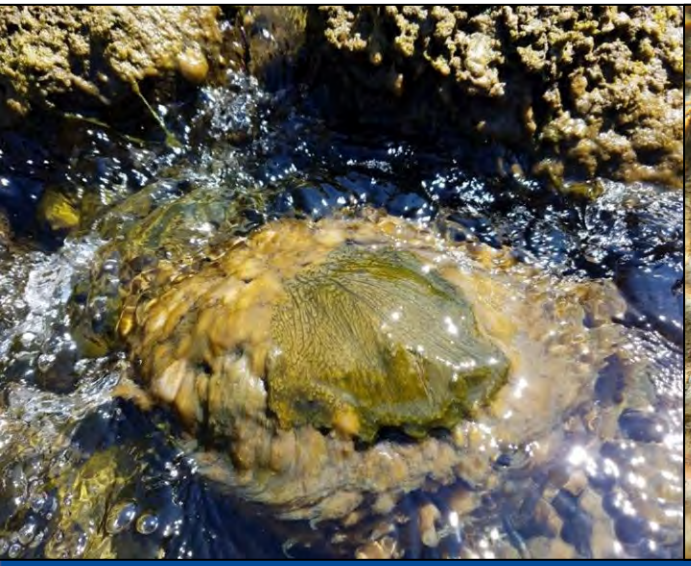


	Total Reports	Confirmed Cyanobacteria
2017	46	NA
2018	63	50
2019	47	26
2020	64	42
2021	47	29
2022*	50	38

*as of Sept. 14, 2022

Benthic HABs

- Benthic (“bottom”) HABs are gaining more attention
- Exposure through ingestion of mat material
- Benthic HABs like clear water with stable flows and substrate



Questions?

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