Harmful Algal Bloom (HAB) Monitoring Program

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Cyanobacteria

- Formerly known as blue-green algae
  - Cyano = **blue**
  - Cell makeup is more closely related to a prokaryotic bacteria than eukaryotic algae, but obtain their energy through photosynthesis
- Microscopic organisms that can form visible colonies; referred to as blooms
- Naturally present in waterbodies and are an integral part of our ecosystems
  - Can tolerate a wide range of conditions, temps, and habitats from oceans to fresh water to bare rock to soil
  - Oldest algae in our fossil history—3.5 billion years old

Cyanobacteria Pros

- Take carbon dioxide out of atmosphere, produce oxygen
- Fix nitrogen and make it available for consumption by the other organisms
- Food source for several aquatic animals

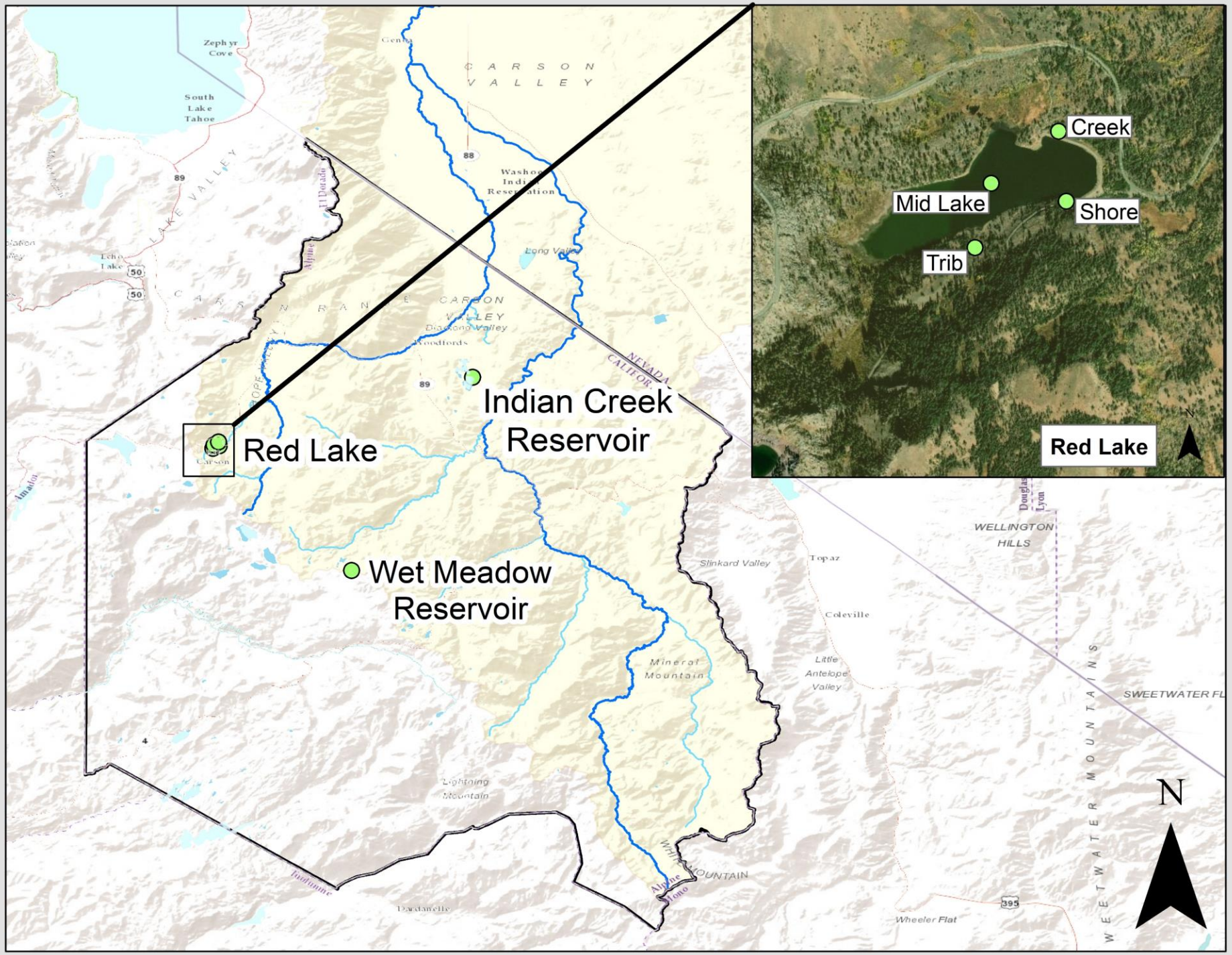
Cyanobacteria Cons

- When provided the right conditions, cyanobacteria can:
  - Cause blooms that decrease water quality
    - By blocking sunlight at water surface
    - By decreasing dissolved oxygen — When blooms die off, bacteria use oxygen for breakdown and release carbon dioxide
      - Fish may suffer or die
  - Produce cyanotoxins that cause illness or can be fatal
    - Neurotoxins: destructive to nerve tissue
    - Hepatotoxins (Microcystis): liver damage
    - Dermatoxins: damages/irritates skin

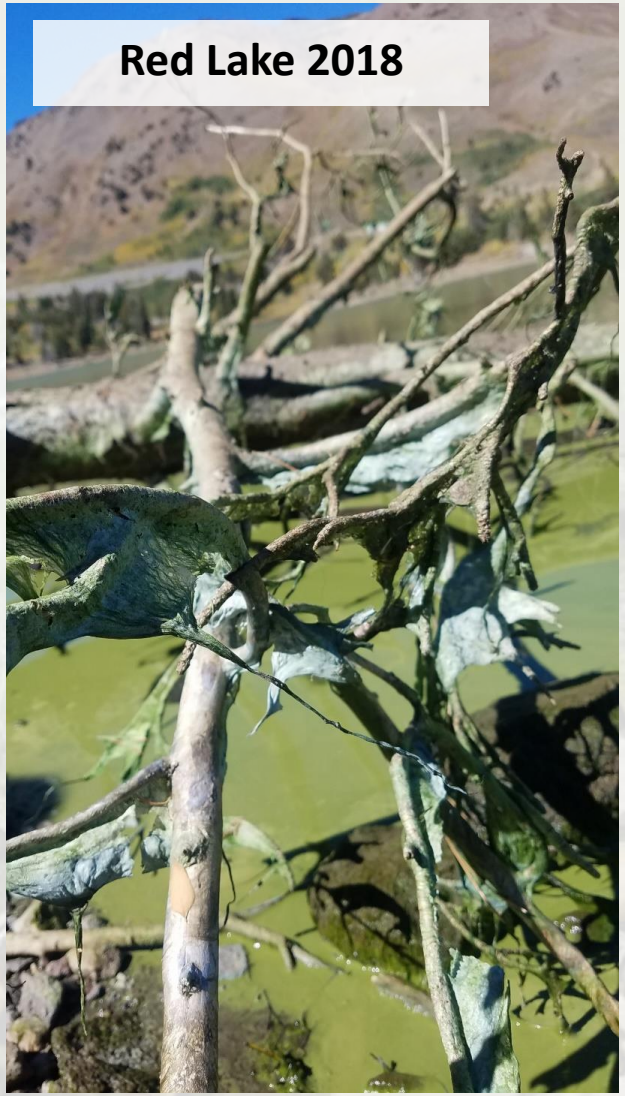
What causes HABs?

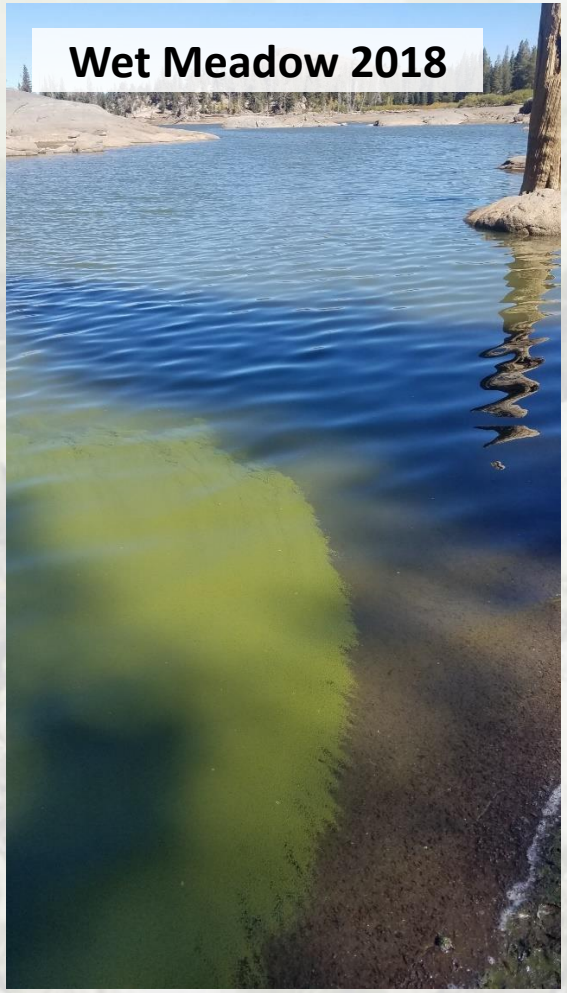
- Stable water column—Slow and stagnant water
- Warm air and water temps
- Plentiful nutrients— Nitrogen (N), Phosphorus (P)
- Sunlight

2019 HAB Monitoring Locations



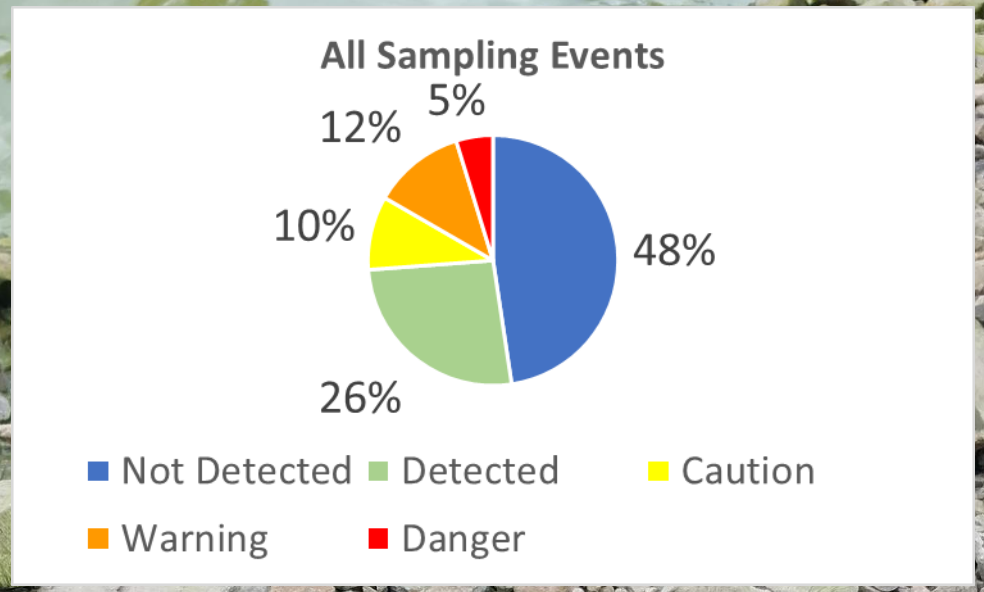
HAB Visual Indicators

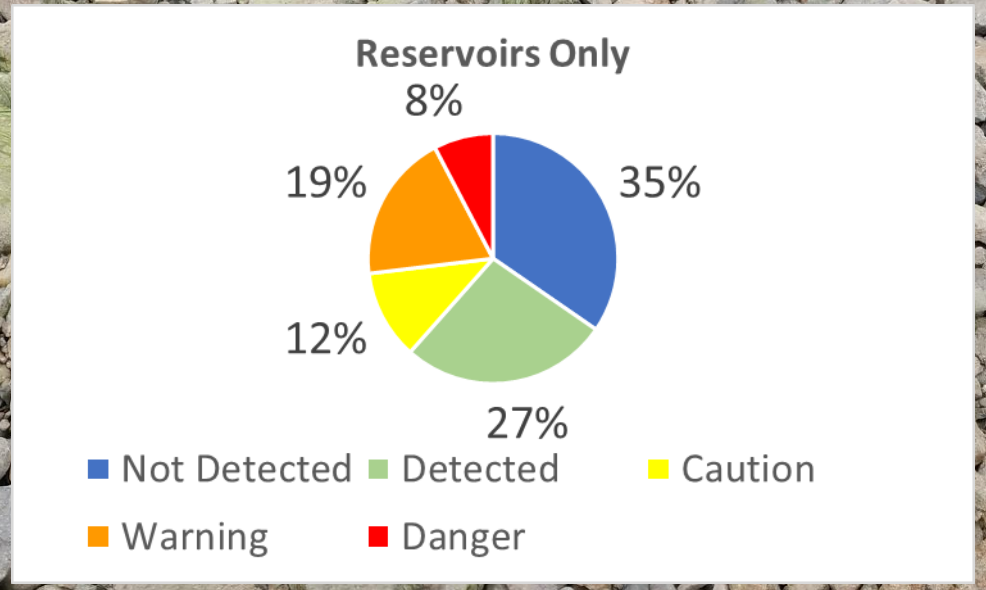




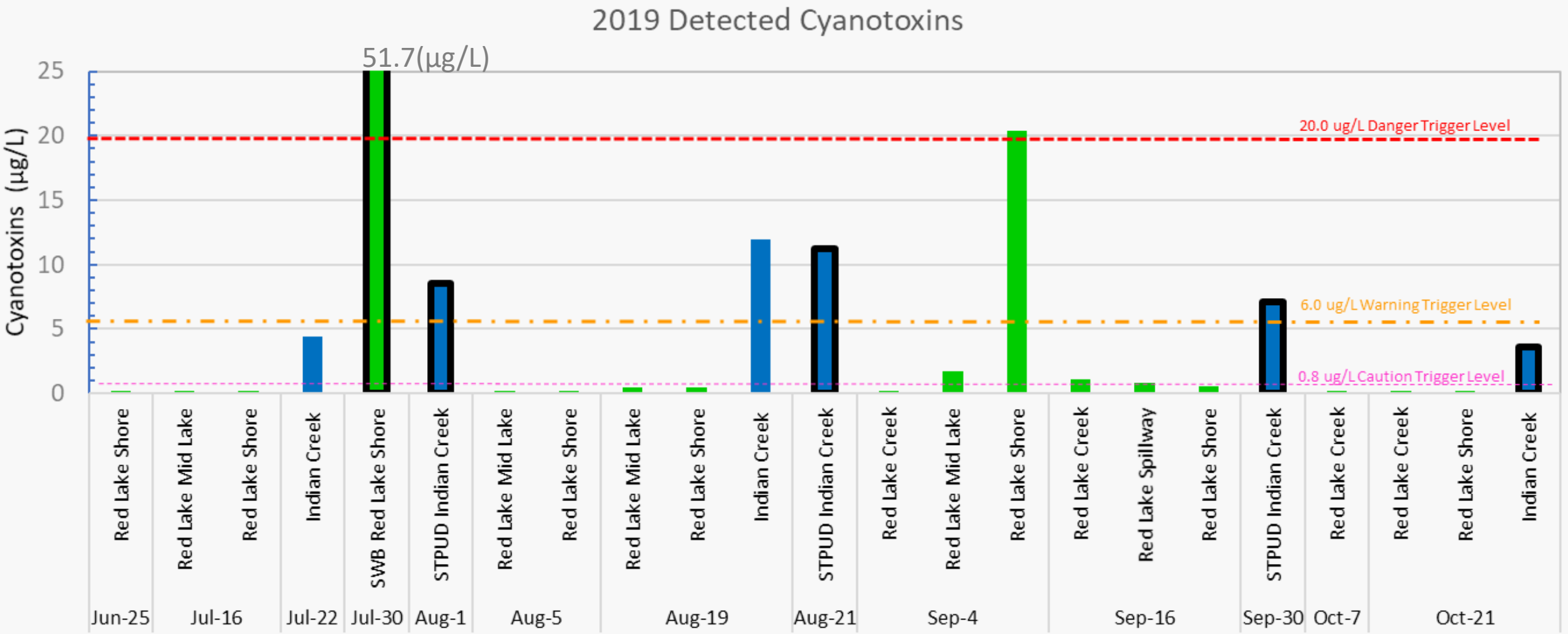
HAB Monitoring Summary

Table 1: Trigger Levels For Human and Animal Health			
	Caution Action Trigger	Warning TIER I	Danger TIER II
Primary Triggers			
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
Secondary Triggers			
Cell Density (Toxin Producers)	4,000 cells/mL	--	--
Site Specific Indicators of CyanoHAB	Visible bloom/discoloration, scum, algal mats, satellite imagery.	--	--





HAB Monitoring Summary



What to do?

- State Water Board's California Harmful Algal Blooms Portal
  https://mywaterquality.ca.gov/habs/index.html

California Harmful Algal Blooms (HABs) Portal

The CA HABs Portal is the central resource for HABs in the state of California. HABs can pose a health risk to people and animals, harm aquatic ecosystems, and limit the use of drinking and recreational waterbodies due to the toxins, odors, and scums or mats they can produce.

The Portal is an informational resource for the public and also functions as a tool to support coordination with statewide partners to address HABs. The content is developed by the CA Cyanobacteria and HAB Network and participating state agencies.

Note: Much of the content included here focuses on freshwater and estuarine HABs; similar content for marine (coastal) HABs is included on the California Harmful Algal Bloom Monitoring and Alert Program (CalHABMAP) webpages.

Healthy Water Habits Video

Understanding the Dangers of Blue-green Algae (Cyanobacteria)

Credit: Department of Water Resources

Toolbox

- Report a Bloom
- HAB Incident Reports Map
- Frequently Asked Questions
- Signs and Guidance for HAB Response
- Field Guide and Forms

Resources

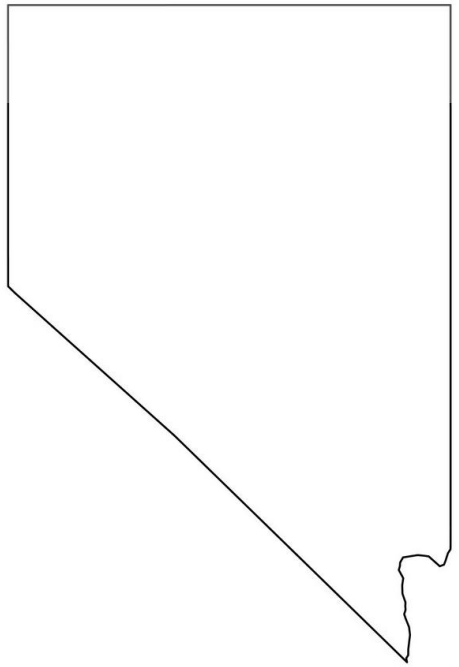
- Announcements
- HAB Data Viewer
- Healthy Water Habits
- Human Health Impacts
- Domestic Animal Impacts
- Fish and Wildlife Impacts

- Training and Collaboration
- Drinking Water
- Monitoring
- Laboratory Resources
- Resources for Mitigating HABs
- HAB Freshwater Incident Response and

Nevada Department of Environmental Spill
(888) 331–6337

Nevada Department of Health & Human Services
(775) 400-0333

Nevada Department of Agriculture
(775) 353-3709



SWB Info
(844) 729-6466
CyanoHAB.Reports@waterboards.ca.gov

Alpine County Public Health
(530) 694-2146
rjohnson@alpinecountyca.gov

Why monitor HABs?

- Public health
- Contribute data to develop management plans or control measures
- Environmental concerns
- Alpine County economy

Thank You!

Questions?