

WQHAP Fall 2021

Utah Department of Environmental Quality
Division of Water Quality
November 3, 2021



UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY
**WATER
QUALITY**

Waterborne Pathogens



UTAH DEPARTMENT *of*
ENVIRONMENTAL QUALITY

**WATER
QUALITY**

Goals of DWQ WP Advisory Program

Identify and quantify waterborne pathogens in the state of Utah to protect public health in recreational waterbodies

- Prioritize waterbodies
- Collect and summarize data
- Coordinate analysis
- Make action and advisory recommendations to local health departments
- Communicate emerging science and information to all stakeholders



WP Advisory Process

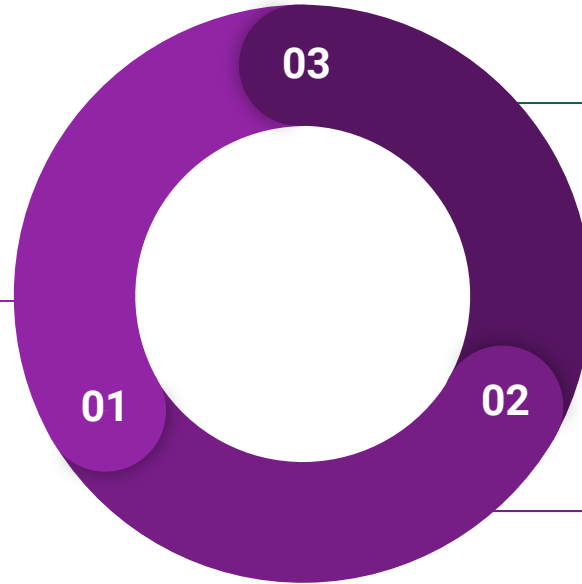
Monitoring

Routine
DWQ and partners monitor prioritized lakes on a monthly basis



Response
DWQ and partners monitor lakes on advisory on a weekly basis

Data Collected
E. coli



Exceedance

Inform LHD

Present data collected along with DWQ recommendation. Assist in answering site specific questions

Communication

Phone call with all stakeholders (i.e. DNR, USFS, etc.) for site specific context

Advisory

Signs

Work with LHD and partners to post signs, make sure signs get posted

Communication

Alert stakeholders to advisory decision. Post information, maps, and narrative about advisory on habs.utah.gov



Waterborne Pathogen Recap 2021

Following new 235 MPN/100mL *E. coli* advisory guidance

Sampling:

- **56** Waterbodies
- **117** Primary sites
- **586** Data submissions*
- **1661** Samples processed*
 - **data still pending*

4 Sites with advisories

- Highland Glen Pond
 - 6/25/21
- Bountiful Pond
 - 7/14/21
- Pineview Reservoir Middle Inlet
 - 8/23/21 to Sept
- Hyrum Reservoir Day Use Beach
 - 8/31/21 to 9/3/21

8 Sites with exceedances of 235 MPN

- Huntington Reservoir north of boat ramp
- Cottonwood Reservoir
- Farmington Pond
- Green River ab Split Mountain Campground
- Mill Creek (Grand) (Revisit was clear)
- Utah Lake American Fork Beach (Revisits was clear)
- Utah Lake near Spanish Fork outlet (Revisit was clear)
- Burt Spring Pond (Revisit was clear)

12 - Organizations participating besides DWQ:

Tri-County, Southeast, Central, Utah County, Weber-Morgan County, Davis County, San Juan County LHDs, Utah Water Watch, Bear Lake Regional Commission, State Parks, DEQ District Engineers, Springville City

HABs



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Goals of DWQ HABs Advisory Program

Identify and quantify toxic cyanobacteria blooms in the state of Utah to protect public health in recreational waterbodies

- Prioritize waterbodies
- Collect and summarize data
- Coordinate analysis
- Make action and advisory recommendations to local health departments
- Communicate emerging science and information to all stakeholders



Recreation Season Advisory Process



Detection

Advisory

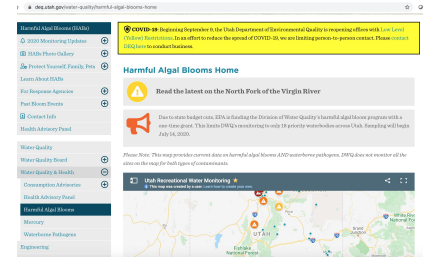


HAB
Advisory
Program

Testing



Communication



Monitoring



HAB Guidance

- No changes anticipated for 2022

Observed / Potential Bloom	Warning Advisory	Danger Advisory
<p>This is not a formal advisory level. Rather, these are indicators that a bloom may exist or may become more severe. Increased monitoring and surveillance are strongly recommended. Indicators may include:</p> <ul style="list-style-type: none"> Visual reports Reports of animal or human illness Detection of cyanotoxins or toxigenic cyanobacterial cell density below thresholds Detectable levels should be defined using appropriate QA/QC procedures <p>Consider cautioning users of the waterbody depending on specifics of the event and waterbody.</p>	<p>Toxigenic Cyanobacteria Cell Density (cells/mL)^{1, 2, 3}</p> <p>100,000^A</p>	See footnote B
	<p>Microcystins (µg/L)^{1, 2, 3}</p> <p>8</p>	2,000
	<p>Cylindrospermopsin (µg/L)³</p> <p>15</p>	See footnote B
	<p>Anatoxin-a (µg/L)^{3, 4, 5}</p> <p>15</p>	90
<p>Health Risks^{1, 2, 3}</p>	<p>Potential for long-term illness</p> <p>Short-term effects (e.g., skin and eye irritation, nausea, vomiting, diarrhea)</p>	<p>Potential for acute poisoning</p> <p>Potential for long-term illness</p> <p>Short-term effects (e.g., skin and eye irritation, nausea, vomiting, diarrhea)</p>
<p>Recommended Actions</p>	<p>Issue WARNING advisory to avoid primary contact recreation</p> <p>Post WARNING signs</p> <p>Sampling recommended at least weekly</p>	<p>Issue DANGER advisory to stay away from the waterbody</p> <p>Post DANGER signs</p> <p>Consider CLOSURE</p> <p>Sampling recommended at least weekly</p>

¹ WHO, 1999. Toxic cyanobacteria in water.

² WHO, 2003. Guidelines for safe recreational water environments, Volume 1, Chapter 8: Algae and cyanobacteria in fresh water.

³ EPA, 2019. Recommended human health recreational ambient water quality criteria or swimming advisories for microcystins and cylindrospermopsin.

⁴ OHA, 2019. Oregon Health Authority. Recreational use public advisory guidelines: cyanobacterial blooms in freshwater bodies.

⁵ CWQMC, 2016. California Water Quality Monitoring Council. Cyanobacteria guidance for recreational and related water uses (2016 update).

^A Human symptoms have been reported between 5,000 – 100,000 cells/ml (EPA 2019). At 5,000 – 100,000 cells/mL, LHDs should take into account contextual information and consider issuing an advisory.

^B Data are sparse on where cylindrospermopsin and cell density danger advisory breakpoints should be. Consult with UDEQ and UDOH as needed on this issue. LHDs should take into account contextual information and consider issuing an advisory

HABs Recap 2021

Sampling:

- **40** Waterbodies
- **54** Primary sites
- **287** Samples

1 Waterbodies with Health Watch

2 Waterbodies with Danger Advisories

- Scofield Reservoir
– 7/16/2021

12 Waterbodies with Warning Advisories

- East Canyon Reservoir
– 8/30/2021
- Mantua Reservoir
– 7/8/2021
- Matt Warner Reservoir
– 6/24/2021
- Panguitch Lake
– 10/8/2021
- Payson Lakes
– 8/18/2021
- Pineview Reservoir
– 8/30/2021
- Utah Lake
– 8/18/2021
- Whitney Reservoir
– 8/19/2021

Recreational Health Off-season updates

- Communication and Signage
- Indicator updates
- Waterbody prioritization

ADVISORY

High levels of BACTERIA have been detected in this WATER.

N.H. Dept. of Environmental Services

**WATER CURRENTLY NOT
SUITABLE FOR WADING
OR SWIMMING!**

Exposure to this water may cause nausea, vomiting, diarrhea, or fever.

Children, the elderly and others with sensitive immune systems are especially vulnerable.

All current advisories posted at www.des.nh.gov.
Click "beach advisory" in left column

CONTACT INFORMATION:
NHDES Beach Program
29 Hazen Dr.; Concord, NH
(603) 271-0698
beaches@des.nh.gov



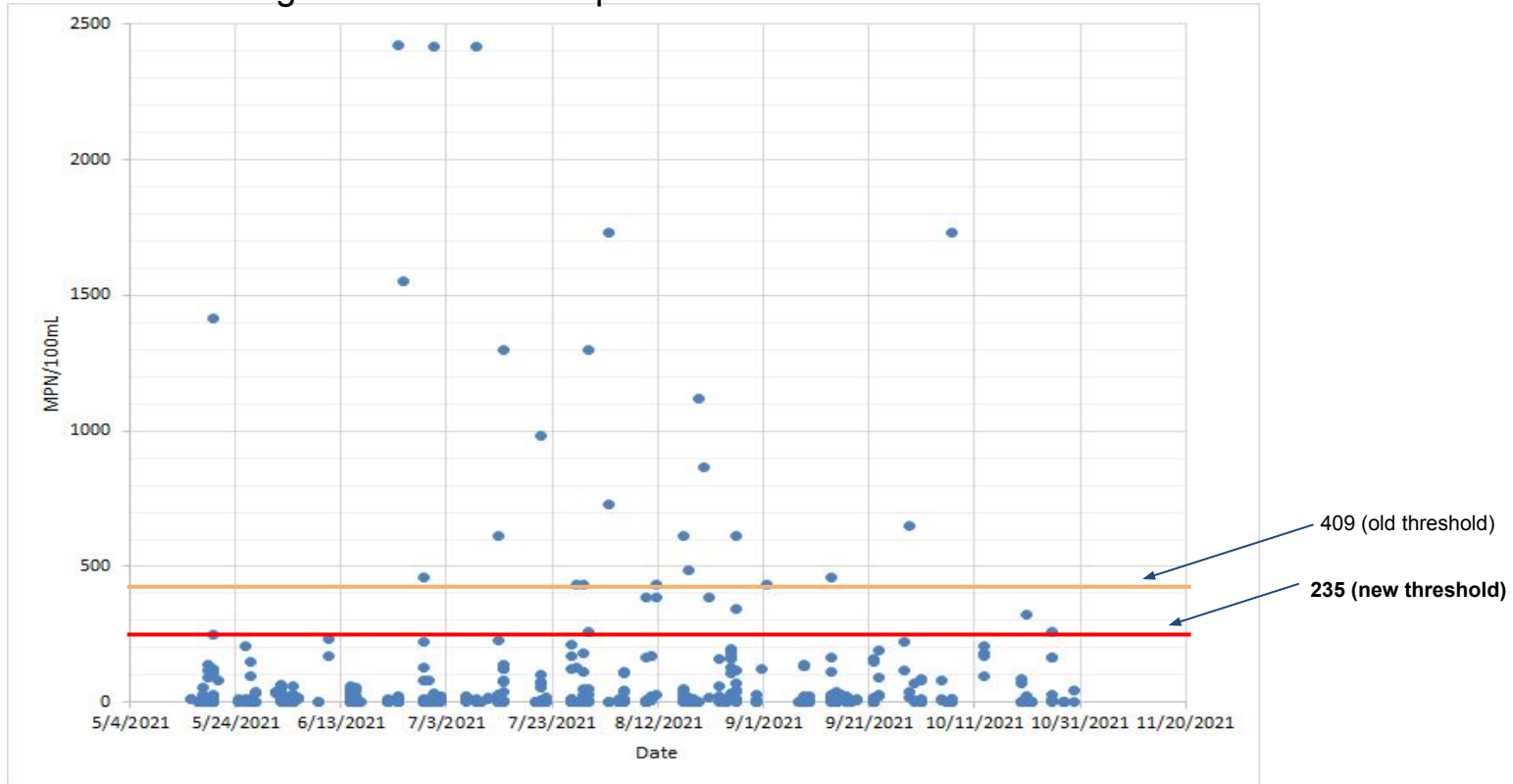
An aerial photograph of a canyon with layered, reddish-brown rock walls. A natural rock arch is visible on the right side, spanning over a river. The text is overlaid on the image.

THANK YOU

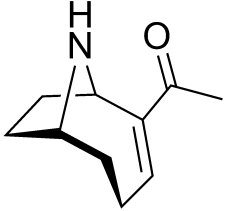
**Questions &
Discussion**

Preliminary Data Overview

2021 Single Maximum MPN per site

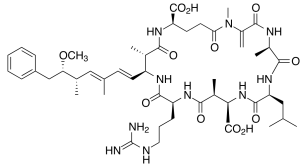


Cyanotoxins - ELISA & LCMS Analysis



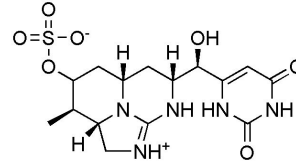
Anatoxin-a

- Neurotoxin
- Also known as Very Fast Death Factor (VFDF)
- Produced by many cyanobacteria species, including those found in Utah waterbodies



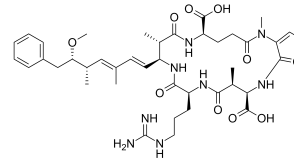
Microcystin

- Hepatotoxin
- Produced by many cyanobacteria species, including those found in Utah waterbodies



Cylindrospermopsin

- Hepatotoxin
- Nephrotoxin
- Produced by many cyanobacteria species, including those found in Utah waterbodies



Nodularin

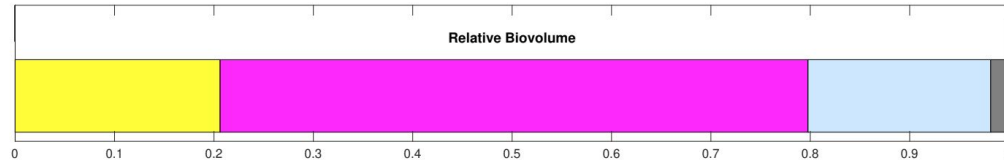
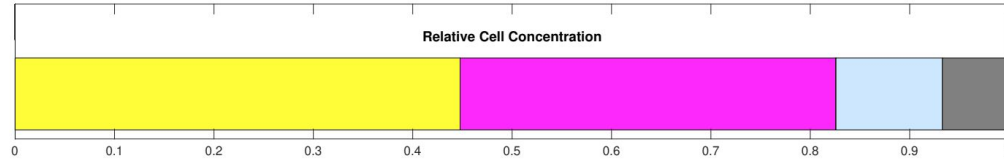
- Hepatotoxin
- Very similar to microcystin
- **Not** produced by many cyanobacteria species rarely found in Utah waterbodies***

Toxigenic Cell Density and Taxonomy

Sample ID: D20201002T192643
 Customer ID: 336
 Tracking Code: 200228-336
 Sample Info: UTA-7-093020-C

System: Utah Lake
 Site: UTA-7-093020-C
 Station: 4917708
 Level: Composite

Date Sampled: 9/30/2020
 Date Received: 10/1/2020
 Date Analyzed: 10/2/2020



Total Algal Concentration: 582928 cells/mL
 HAB Concentration: 561280 cells/mL
 HAB Relative Concentration: 96%

Total Biovolume: 175532625 $\mu\text{m}^3/\text{mL}$
 HAB Biovolume: 158258837 $\mu\text{m}^3/\text{mL}$
 HAB Relative Biovolume: 90%

! WARNING !

HAB concentration is high - Toxin testing recommended.

