

US EPA ARCHIVE DOCUMENT



Multi-Agency Coordination and Response of Harmful Algal Blooms in Utah

EPA Region 9 HAB Workshop
April 26, 2017

For assistance in accessing this document please send
an email to EPACyanoHABs@epa.gov

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Utah Department of Environmental Quality

2016 cHABs in Utah Waters



Ksl.com

- ❑ Blackridge Reservoir
- ❑ Mantua Reservoir
- ❑ Payson Lakes (n=4)
- ❑ Scofield Reservoir
- ❑ Utah Lake
- ❑ Farmington Bay
- ❑ Upper Box Cr. Reservoir



Justun Edwards

3 Pillars of UDWQ HAB Program

- GUIDANCE
- MONITORING
- COMMUNICATION





HAB Program Pillars

1. Guidance

2016 UDEQ/UDOH Guidelines for HABs

Toxin Producing Blue-green algae Cell Density (cells/mL)	Health Risks	Action Recommended	Microcystin Concentrations (µg/L)	Relative Probability of Acute Health Risk
<20,000	Negligible	None	<4	Low
20,000-100,000	Short-term effects e.g. skin irritation, gastrointestinal illness	Issue caution advisory; Post CAUTION sign; Weekly sampling recommended	4-20	Low to Moderate
100,000 – 10,000,00 or reports of animal illnesses or death	As above for low risk, and potential for long-term illness	Issue warning advisory; Post WARNING sign; Weekly sampling recommended	20-2,000	Moderate to High
>10,000,000 or large scum mat layer or reports of human illness;	As above for moderate risk, and potential for acute poisoning	Issue Danger Advisory; Post DANGER sign; Weekly sampling recommended Consider Closure	>2,000	High

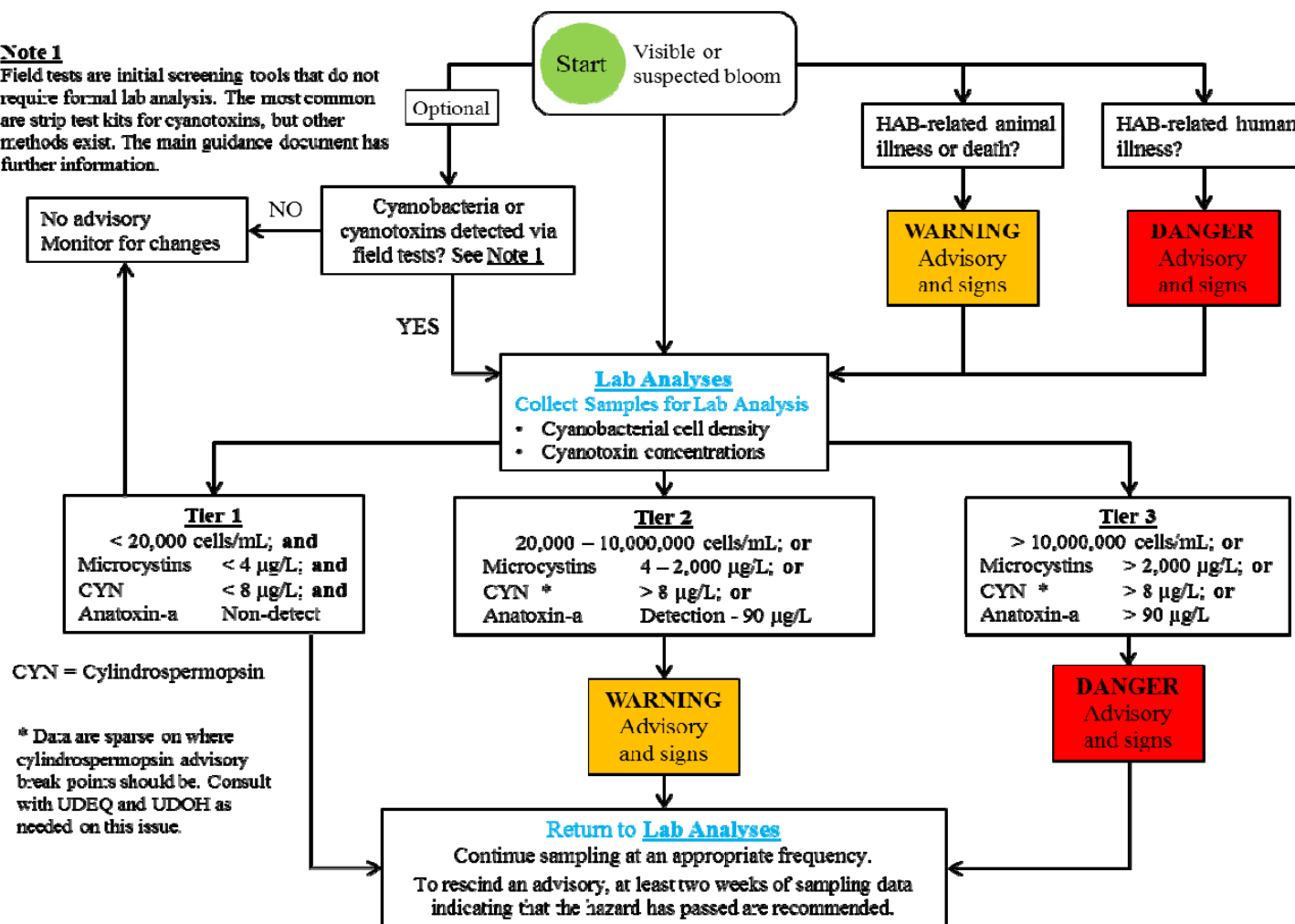
Draft 2017 UDEQ/UDOH HAB Guidance

	Tier 1: None	Tier 2: Warning	Tier 3: Danger
Relative Probability of Acute Health Risk ¹	Low	Moderate	High
Cyanobacterial Cell Density (cells/mL) ¹	< 20,000	20,000 - 10,000,000	>10,000,000
Microcystins (µg/L) ^{1,2}	< 4	4 – 2,000	> 2,000
Cylindrospermopsin (µg/L) ²	< 8	> 8 *	> 8 *
Anatoxin-a (µg/L) ³	Non-detect	Detection - 90	> 90
Additional Factors	None	Reports of animal illness or death	Reports of human illness
Health Risks ¹	Negligible	Potential for long-term illness Short-term effects (e.g., skin and eye irritation, nausea, vomiting, diarrhea)	Potential for acute poisoning Potential for long-term illness Short-term effects (e.g., skin and eye irritation, nausea, vomiting, diarrhea)
Recommended Actions	None	Issue WARNING advisory Post WARNING signs Sampling recommended at least weekly	Issue DANGER advisory Post DANGER signs Consider CLOSURE Sampling recommended at least weekly

HAB Decision-making algorithm

Note 1

Field tests are initial screening tools that do not require formal lab analysis. The most common are strip test kits for cyanotoxins, but other methods exist. The main guidance document has further information.



Additional HAB Guidance Resources

Utah Division of Drinking Water

Draft Guidance that educates drinking water facilities how to prepare, respond, and act when source and treated waters become impacted



Utah Department of Agriculture and Food

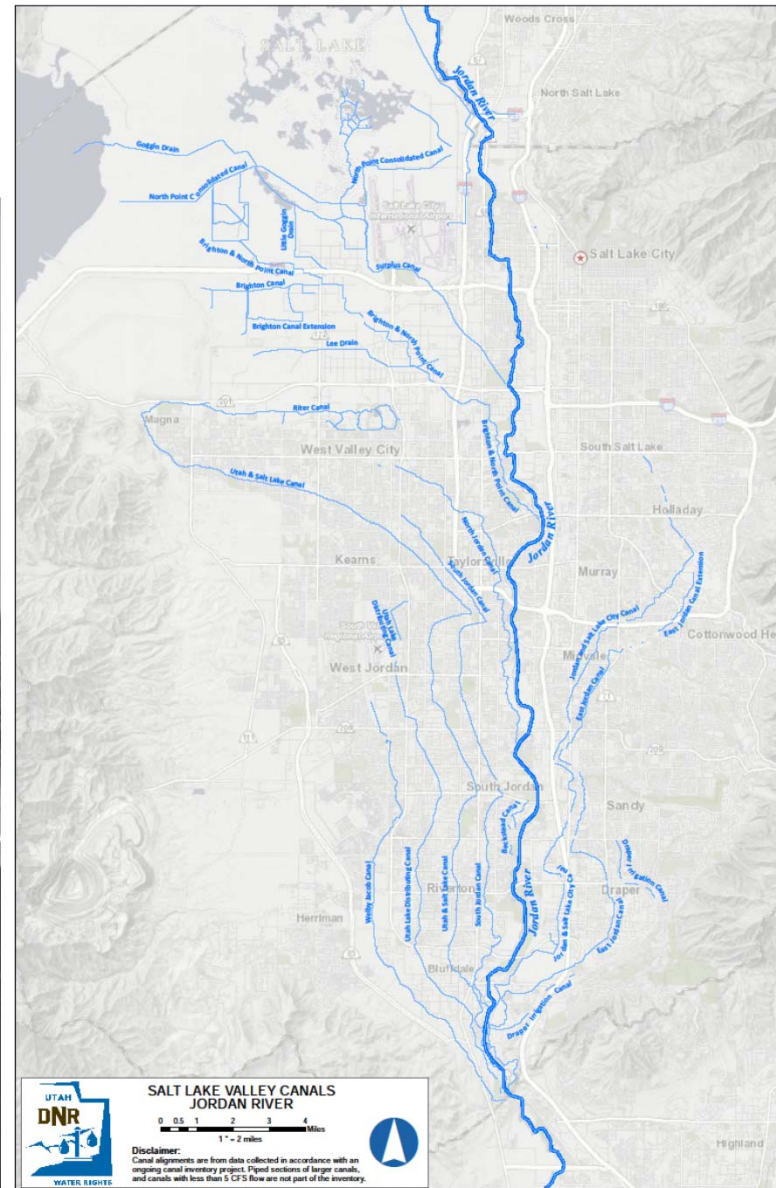
Developing a HAB program that provides guidance for livestock and agricultural producers



Price City drinking water intake 2016



Jordan River irrigation & secondary water use





HAB Program Pillars

2. Monitoring

Monitoring: Prioritize Utah's Vulnerable Waters

Increase monitoring of most vulnerable waters

- Develop HAB collection SOP that targets a 'reasonable maximum' of cyanobacteria exposure to the public
- Coordination with Division of Drinking Water, State Parks, Drinking Water Providers, District Engineers, Dept. Agriculture, and Local Health Departments.
- DWQ and USU: Utah Water Watch (citizen monitoring) have scopes, test strips and trained staff to provide initial screen at select locations (via NOAA program).



Types of Analysis

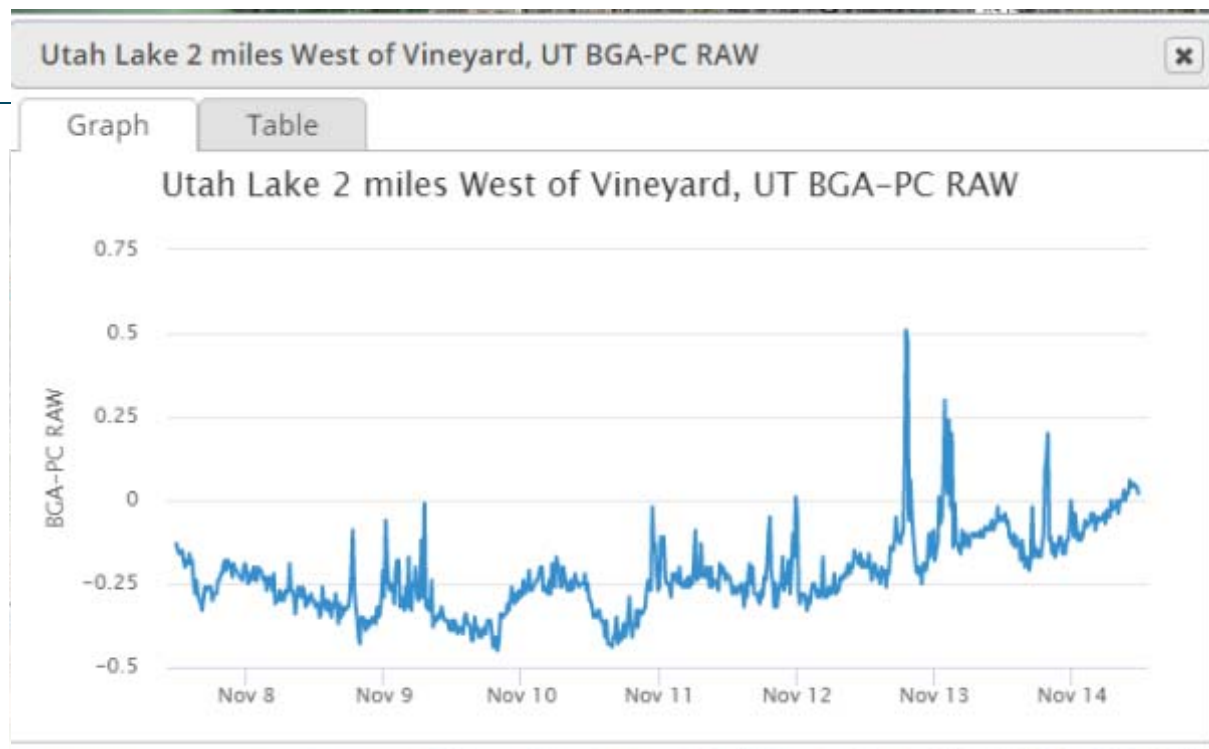
- Cyanobacteria taxonomy and cell count – Rushforth Phycology
 - 24 to 48 hour turn around time
- Cyanotoxin test strip screen – Abraxis
 - Day of sampling
 - Limited to cylindrospermopsins, microcystins and anatoxin-a (not saxitoxins)
 - Limited to various screening levels– recreation values set at >10 ug/L
- Cyanotoxin qPCR screen (pilot)- Phytogigene
- Cyanotoxin analysis – GreenWater Lab, EPA R8, (and Utah State Labs?)
 - 48 to 96 hour turn around time at best; 1 week is more likely
 - ELISA and LC/MS/MS results and costs vary
 - Differences in capacity, result ranges, and sample submission
 - This level of laboratory quality is needed for conducting water quality assessments



Utah Lake Buoy Network

- 3 high frequency sondes
- Telemetered every 60 min.
- Parameters:
 - Temperature
 - Conductance
 - pH
 - Dissolved oxygen
 - DO saturation
 - Chlorophyll
 - Turbidity
 - Blue-green algae
- iUTAH partnership

<https://wqdatalive.com/public/669>





HAB Program Pillars

3. Communication

Communication: Incoming/Outgoing

DEQ 24-hour Spill Line: 801.536.4123

Utah Poison Control Center: 1.800.222.1222

DEQ website:

HABS.UTAH.GOV

UT Department of Health:

<http://health.utah.gov/enviroepi/appletree/HAB>



Response Coordination

Partners:

UDEQ: DWQ/DDW, UDNR, Local Health Departments, Poison Control, UDAF, UDEM, Drinking water providers, municipalities, US EPA and NOAA, USFWS, labs, universities, volunteers and more to come...

Steer monthly communication team*

Develop inter-agency response coordination process

- Local Health Departments are the lead (Utah)
- All relevant agencies should be notified
- Public notification process (SOCOs, press releases)



Develop SOCOs

Single Overriding Communication Objective (SOCO) Worksheet (US CDC)

Key Message: Provides Meaning and Context: state the key point or objective you want to communicate.

Key Facts: What are the three (3) most important facts you need an individual to understand about the Drinking Water Advisory?

Target Audience: Who is the main audience or population segment you would like this message to reach? Who is the secondary audience?

What is the one message or action someone needs to understand?

Primary Contact: Who in your office/organization is the primary point of contact?



Utah Lake Closure



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alma Matheson
Executive Director

Brad T. Johnson
Deputy Director

Utah County
Health Department



NEWS RELEASE

July 15, 2016

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Potential Health Risks Force Closure of Utah Lake from Harmful Algal Bloom

Lab tests confirms a high probability of health risks

SALT LAKE CITY - Public health officials have decided to close Utah Lake, effective immediately, due to a large, harmful algal bloom that may pose a serious health risk to the public and animals. The Utah Department of Health (UDOH) and Utah County Health Department (UCHD) say lab results for samples collected by the Utah Department of Environmental Quality (DEQ) show the concentration of algal cells in the water are three times the threshold for closing a body of water.

DANGER

LAKE CLOSED

due to toxic algae

KEEP OUT OF LAKE

Call your doctor or veterinarian if you or your animals have sudden or unexplained sickness or signs of poisoning.

Report new algae blooms to the Department of Environmental Quality:

Call your local health department:



Utah Poison Control Center Reports



676 Reported Cases (As of November 1)

Human Exposure (533)	79%	Recreated in or exposed to Utah Lake Water
Animal Exposure (34)	5%	14 dogs (8 UT Co., 5 SL Co., 1 WY)
Information only (109)	16%	

32% of cases are symptomatic

Symptoms reported:

- GI: diarrhea, nausea, vomiting, and abdominal pain
- Skin: rash and irritation
- Neuro: headache, dizziness, drowsiness
- Ocular: irritation

Currently largest HAB exposure incident in the US CDC database- One Health HABS



Taking Action

What can we do?

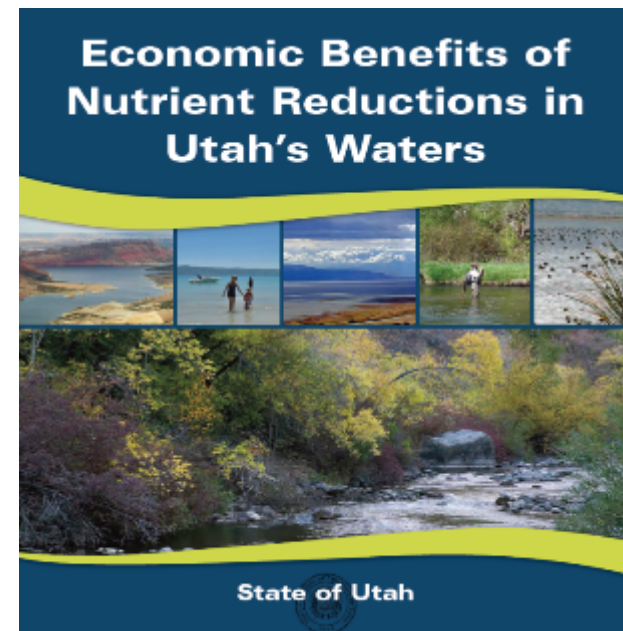
Develop Economic Studies

Utah's Public Interest in Nutrient Reduction (2013)

- 97% of Utah households - important to maintain water quality for future generations
- Utahns are willing to spend \$8 to \$32/month to protect and improve waters that are threatened by increasing levels of nutrients
- Utahns spend about \$1.4 to \$2.4 billion a year on water-based recreation activities

Economic Impacts to Utah from HABs (2017)

- Assess costs associated with 2016 HABs to recreation, agriculture, utilities



Utah's 2014 Technology-Based Phosphorus Effluent Limit

- Developed with extensive stakeholder input
 - Proposed by the POTW community and vetted with plant operators
- What does the rule allow?
 - Effluent limit of 1 mg/L total phosphorus by 2020
 - Variances



Utah Lake Water Quality Study

The Division is conducting a water quality study on Utah Lake to:

- Evaluate the role of excess nutrients on beneficial use impairments
- Identify appropriate in-lake nutrient endpoints

Driving Factors

- Continuation of previous studies
- Additional nutrient related 303(d) impairments
- Recent HAB events
- Regulatory certainty



Downstream Waters: Jordan River – Great Salt Lake

~80 tons/year total phosphorus exported to Jordan River from Utah Lake



Farmington Bay



Wetlands and Ponds



Jordan River



Impounded Wetlands



Utah Lake

QUESTIONS



Contact:
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