

Utah Lake, Jordan River and Canals 2016 Harmful Algal Bloom

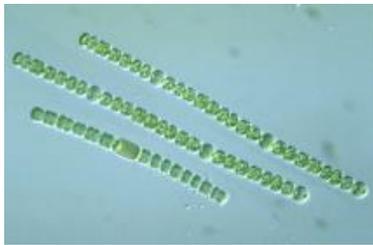


August 24, 2016

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Division of Water Quality
Utah Department of Environmental Quality

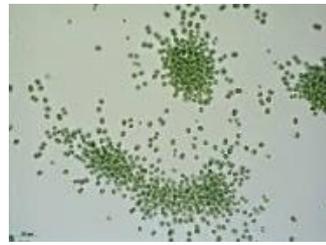
Cyanobacteria and their toxins (cyanotoxins)

- Liver, nerve, or skin toxins
- Selectively produced by many genera but not very predictable
- Widely distributed but not often at acutely toxic levels
- Analyses are available for some *but not all* of these toxins



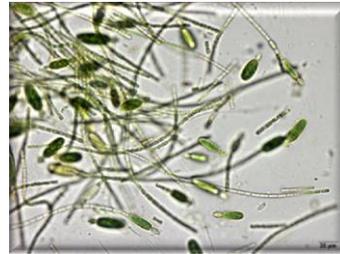
Dolichospermum
(Anabaena)

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



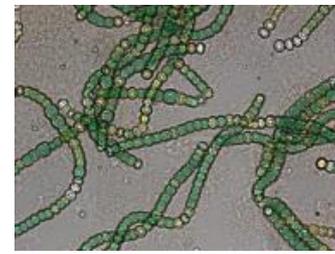
Microcystis

- Microcystin (liver)
- Toxin is most common and easily measured
- 160 congeners



Cylindrospermopsis

- Cylindrospermopsins (liver)
- Saxitoxins (nerve)
- Benthic/epiphytic rather than planktonic



Nodularia

- Nodularin (liver)
- Found in brackish water including bays of Great Salt Lake



Aphanizomenon

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

Types of Analysis

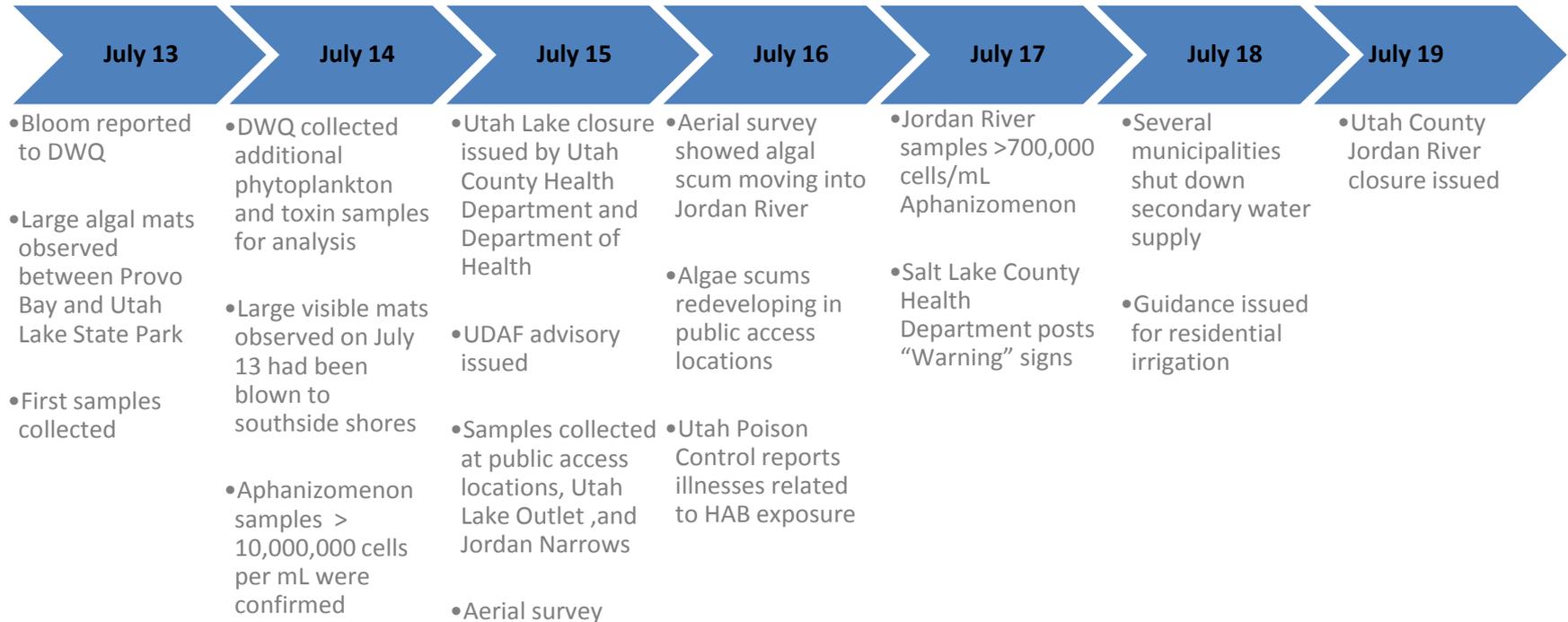
- Species Identification and cyanobacteria cell count concentrations – Rushforth Phycology
 - 24 to 48 hour turn around time
- Cyanotoxin pre-screening test strips –
 - Day of sampling
 - Limited to cylindrospermopsins, microcystins and anatoxin-a (not saxitoxins)
- Cyanotoxin analysis – Greenwater Lab
 - 48 to 96 hour turn around time

UDEQ/UDOH Guidelines for HABs

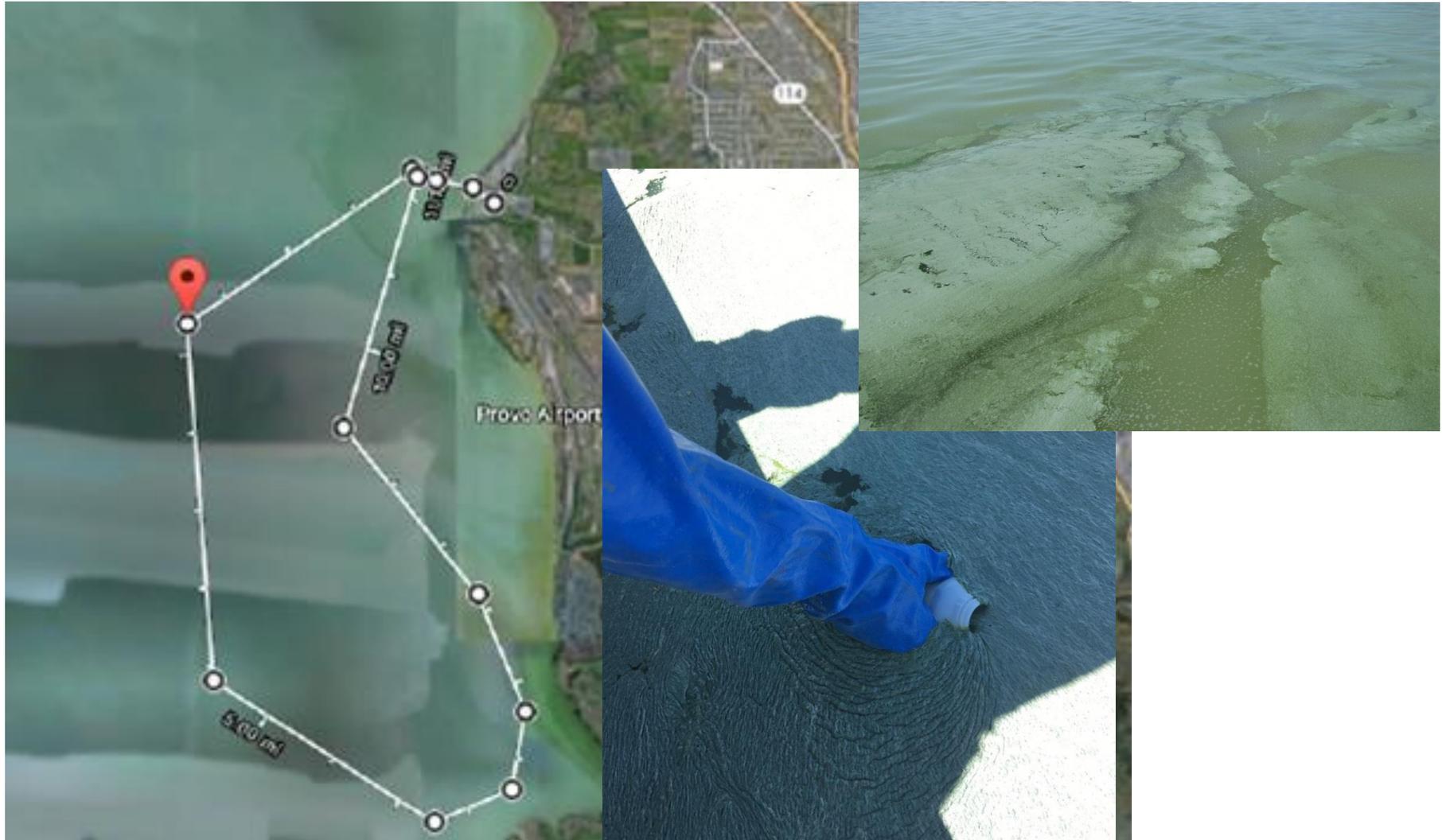
Toxin Producing Blue-green algae Cell Density (cells/mL)	Health Risks	Action Recommended	Relative Probability of Acute Health Risk
<20,000	Negligible	None	Very Low
20,000-100,000	Short-term effects e.g. skin irritation, gastrointestinal illness	Issue caution advisory; Post CAUTION sign; Weekly sampling recommended	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	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	Very High



Timeline



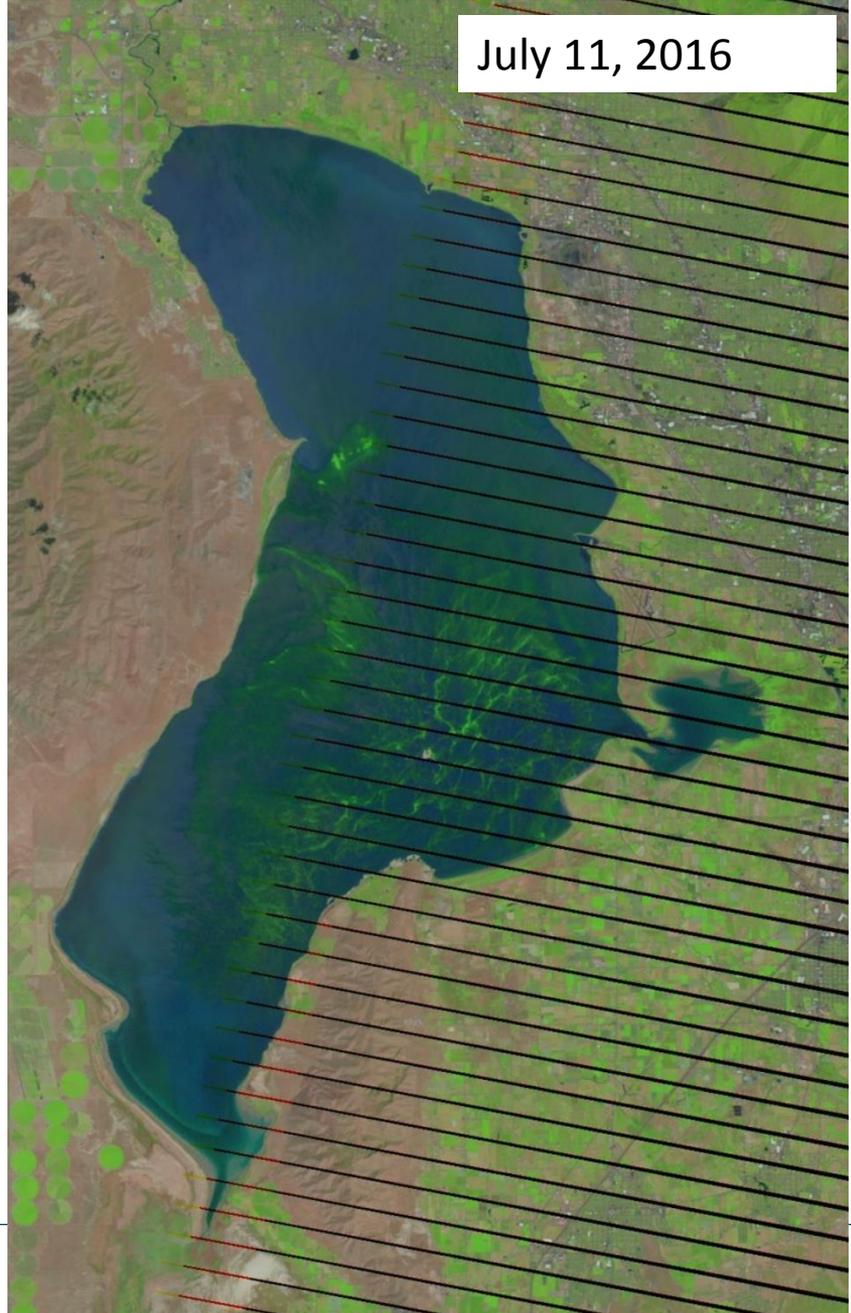
July 13, 2016 Sampling



July 2, 2016



July 11, 2016



July 15, 2016



Utah Lake Closure



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

Brad T Johnson
Deputy Director



NEWS RELEASE
July 15, 2016

CONTACT
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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:



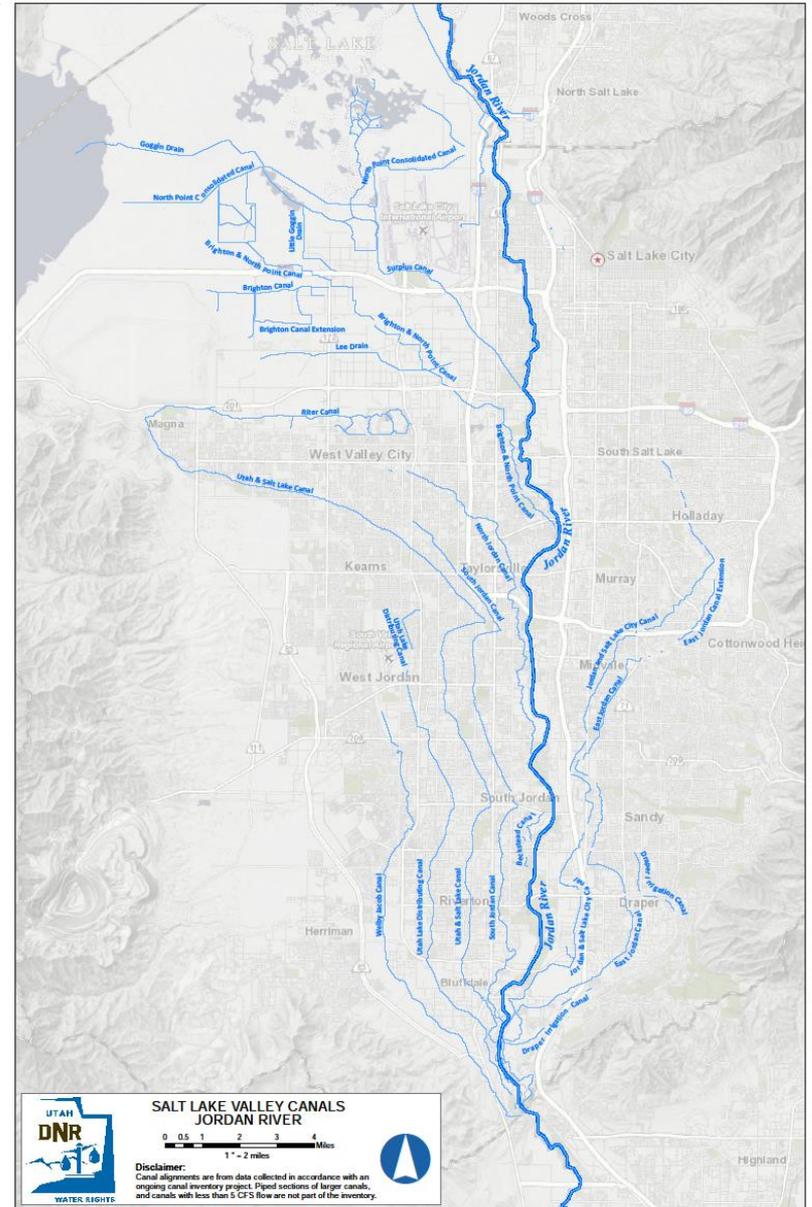
Potential Health Risks Force Closure of Utah Lake from Harmful Algal Bloom

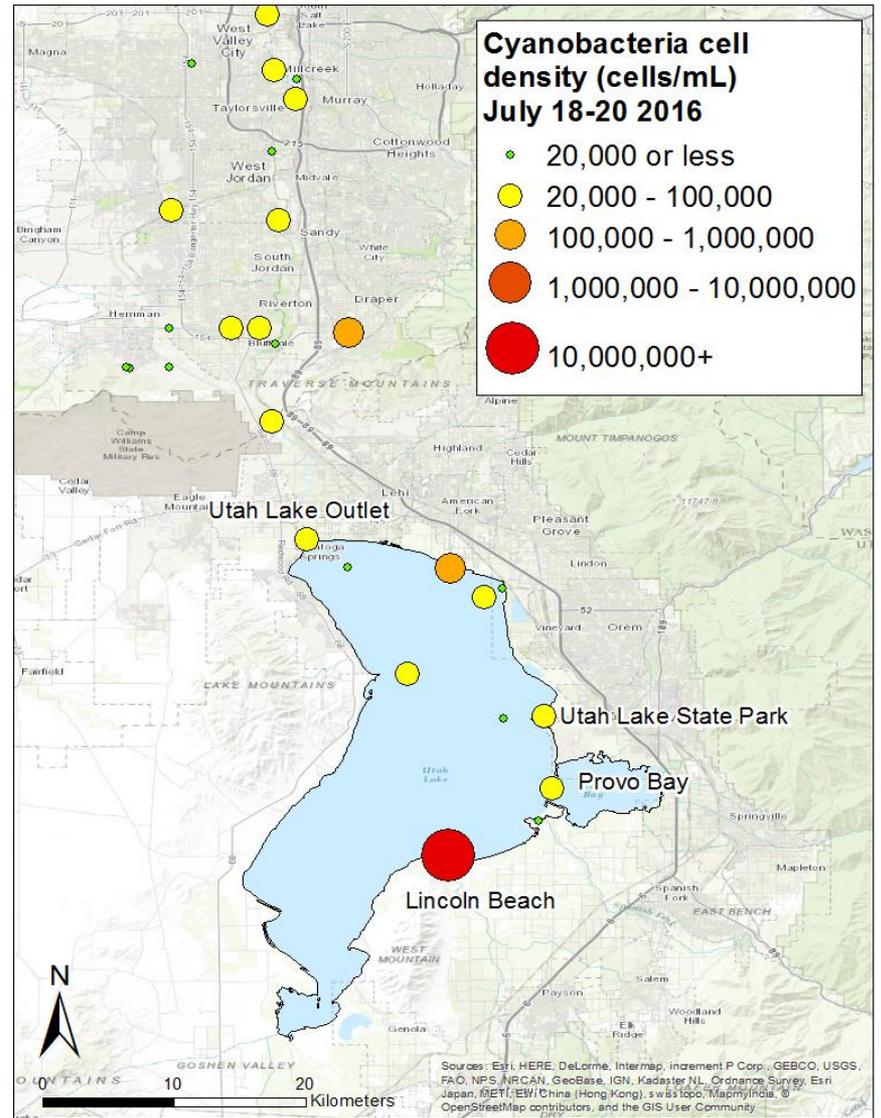
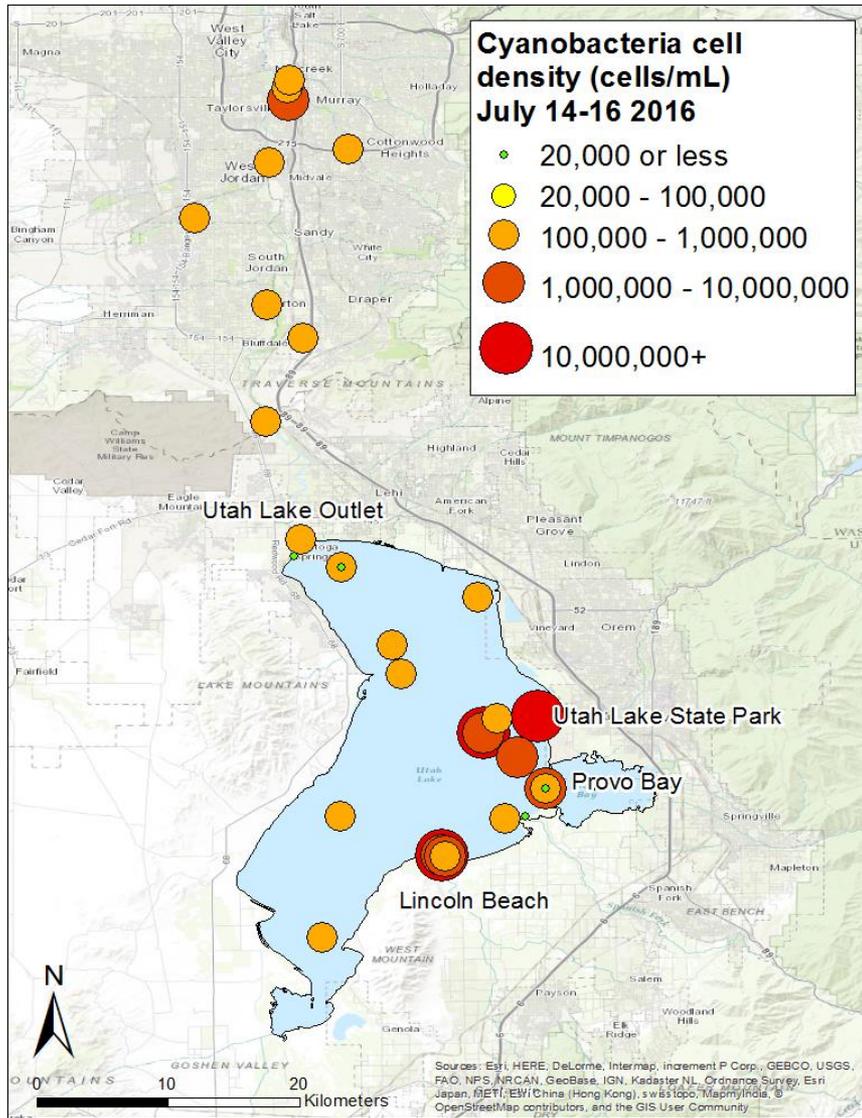
Lab tests confirms a high probability of health risks

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.

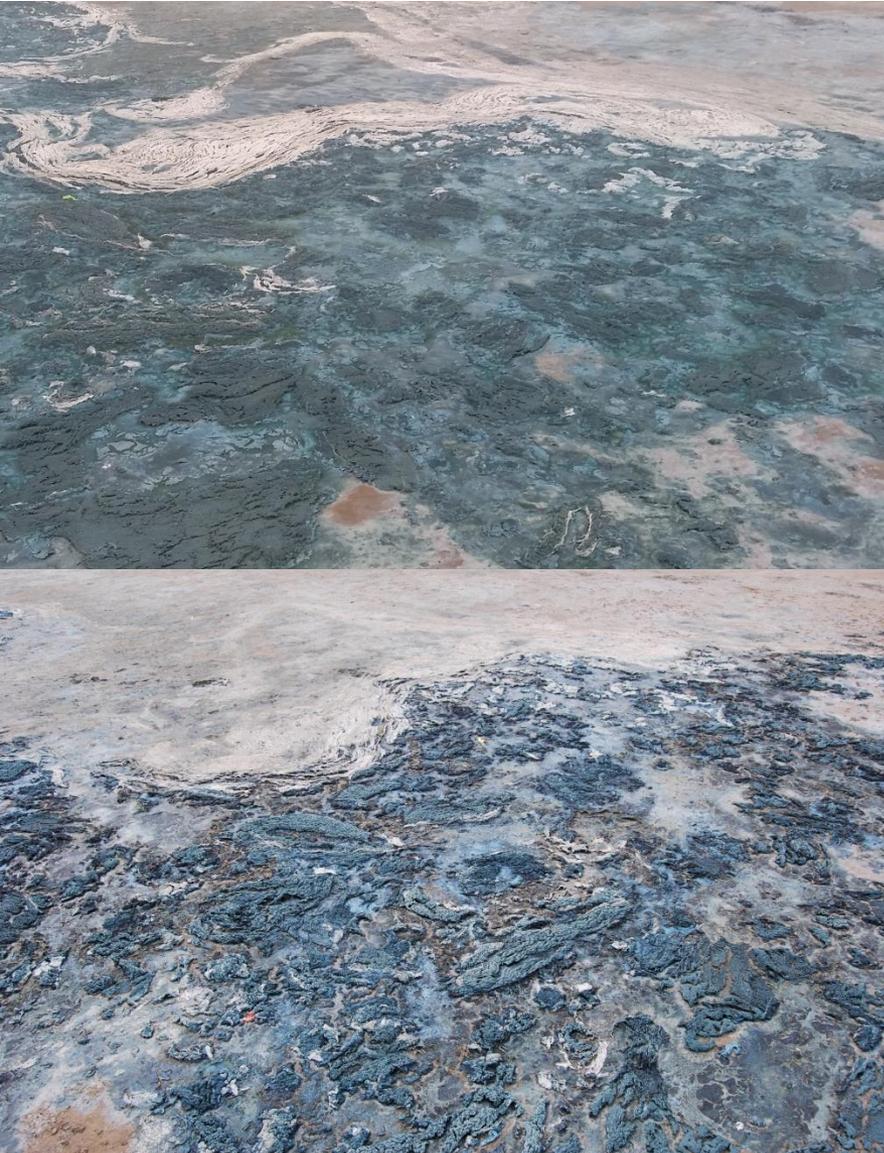


What About the Jordan River?





Utah Poison Control Center



636 Reported Cases (As of August 1)

Human Exposure (504)	81%	Recreated in or exposed to Utah Lake Water
Animal Exposure (27)	4%	14 dogs (8 UT Co., 5 SL Co., 1 WY)
Information only (86)	14%	

31% of cases are symptomatic

Symptoms Reported:

GI: diarrhea, nausea, vomiting, and abdominal pain

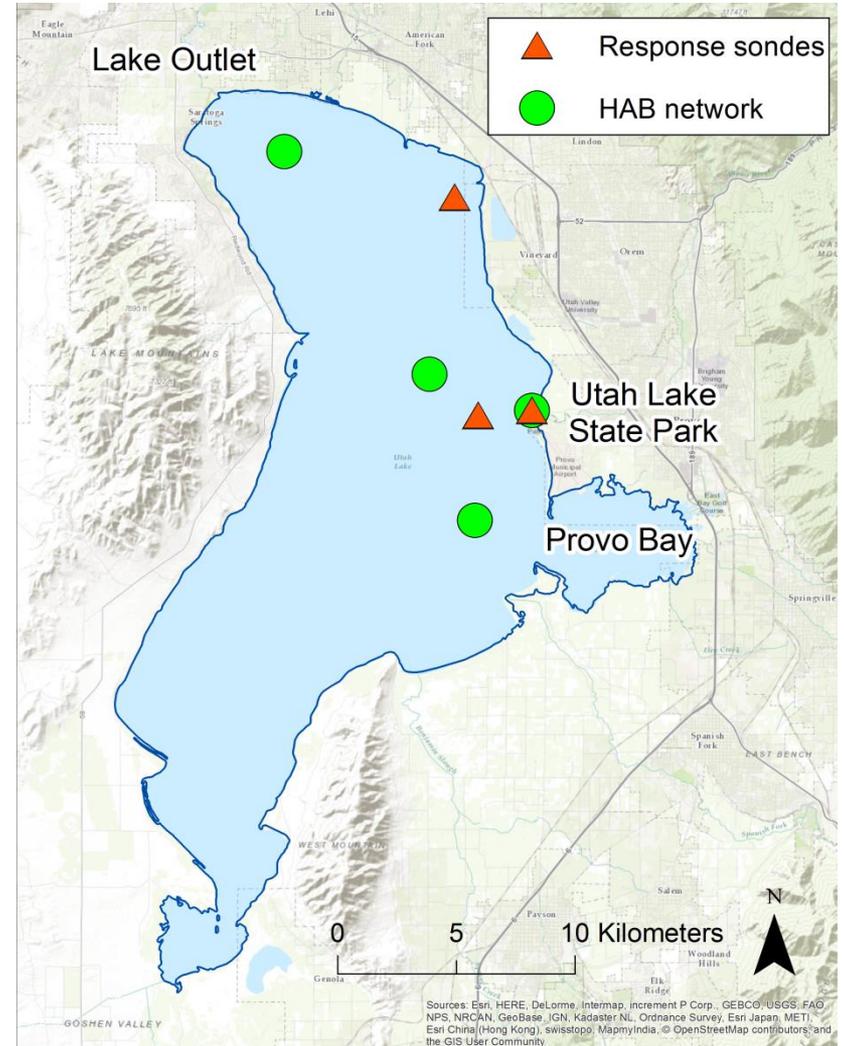
Skin: rash and irritation

Neuro: headache, dizziness, drowsiness

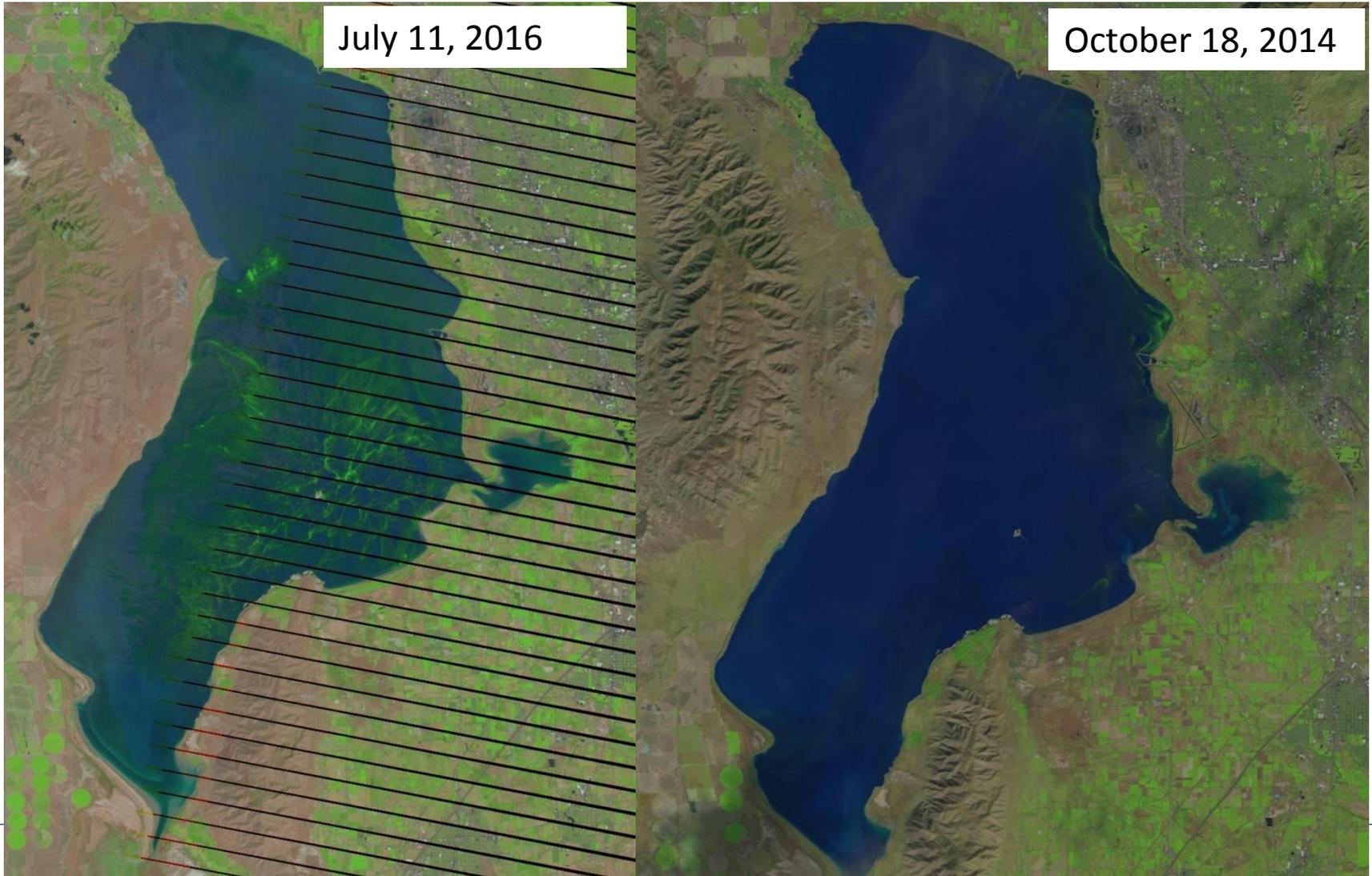
Ocular: irritation

HAB Monitoring Network

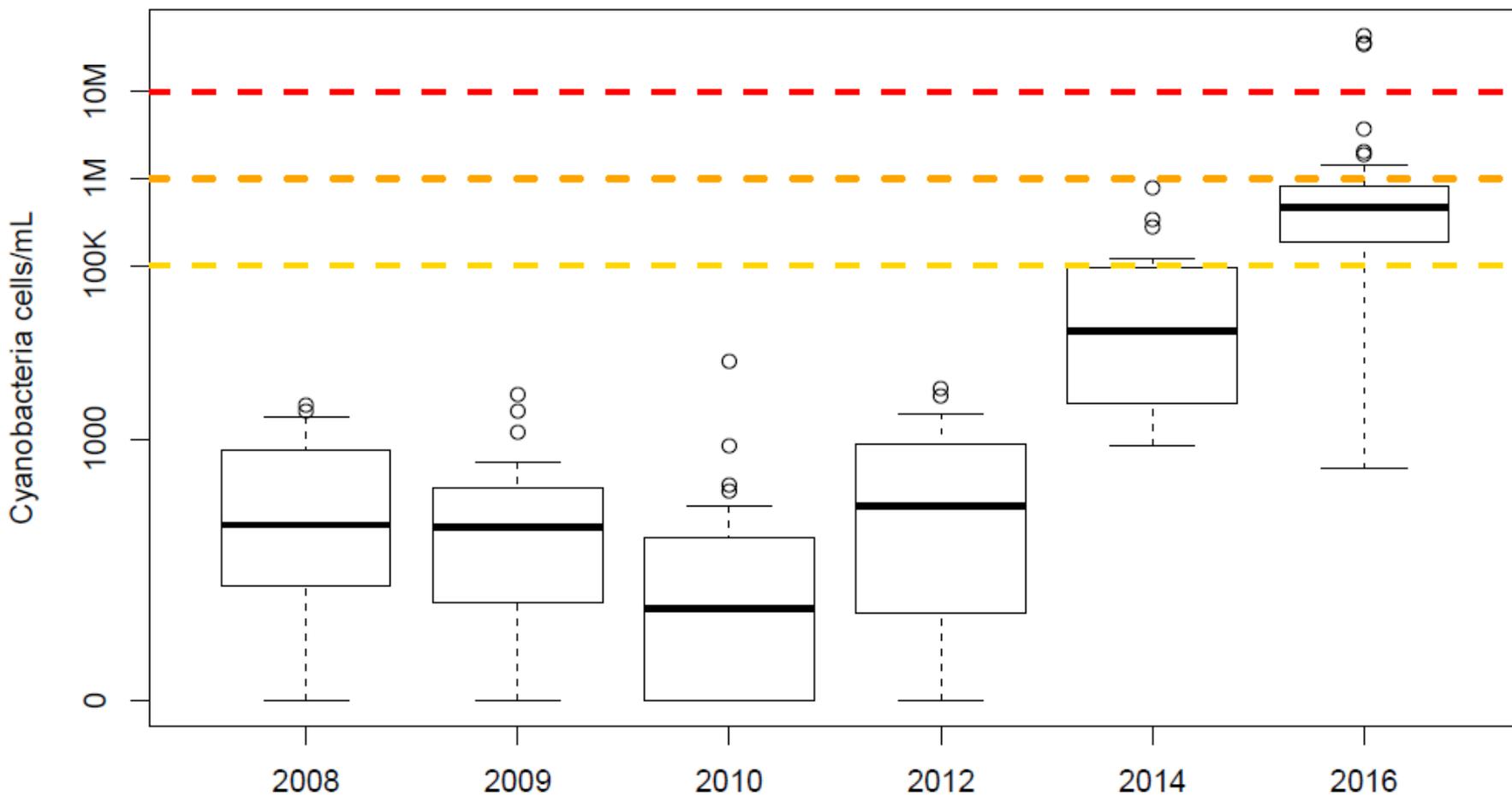
- Utah Water Quality Board Funding - \$100,000
 - 3 Open water buoys
 - YSI sondes (dissolved oxygen, pH, temperature, specific conductivity, chlorophyll a, phycocyanin)
 - Telemetered real-time data linked to publicly available I-Utah network.
 - Water chemistry and phytoplankton sampling



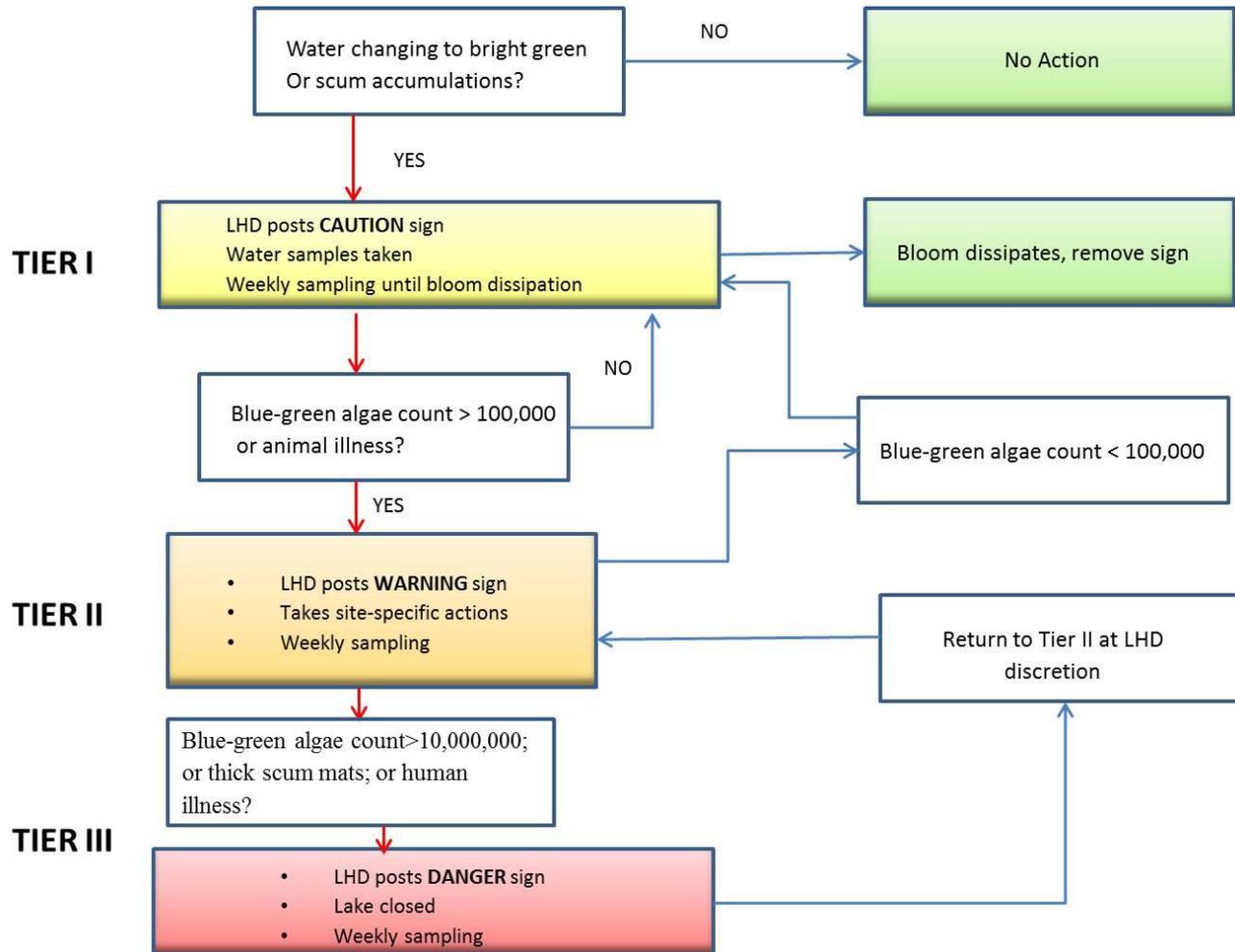
How Does it Compare?



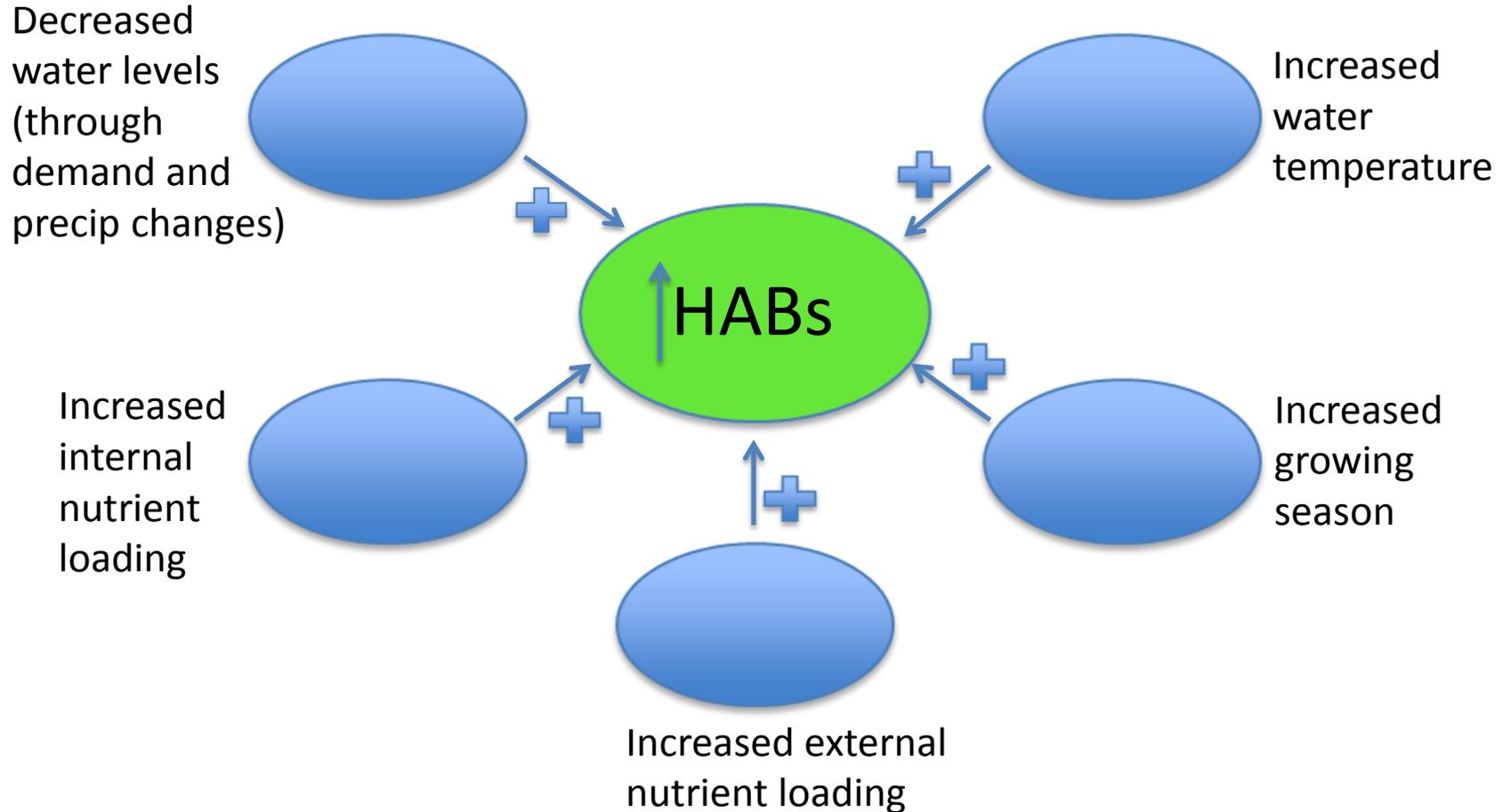
How does it compare?



HAB Decision-making Algorithm [Tier 1]

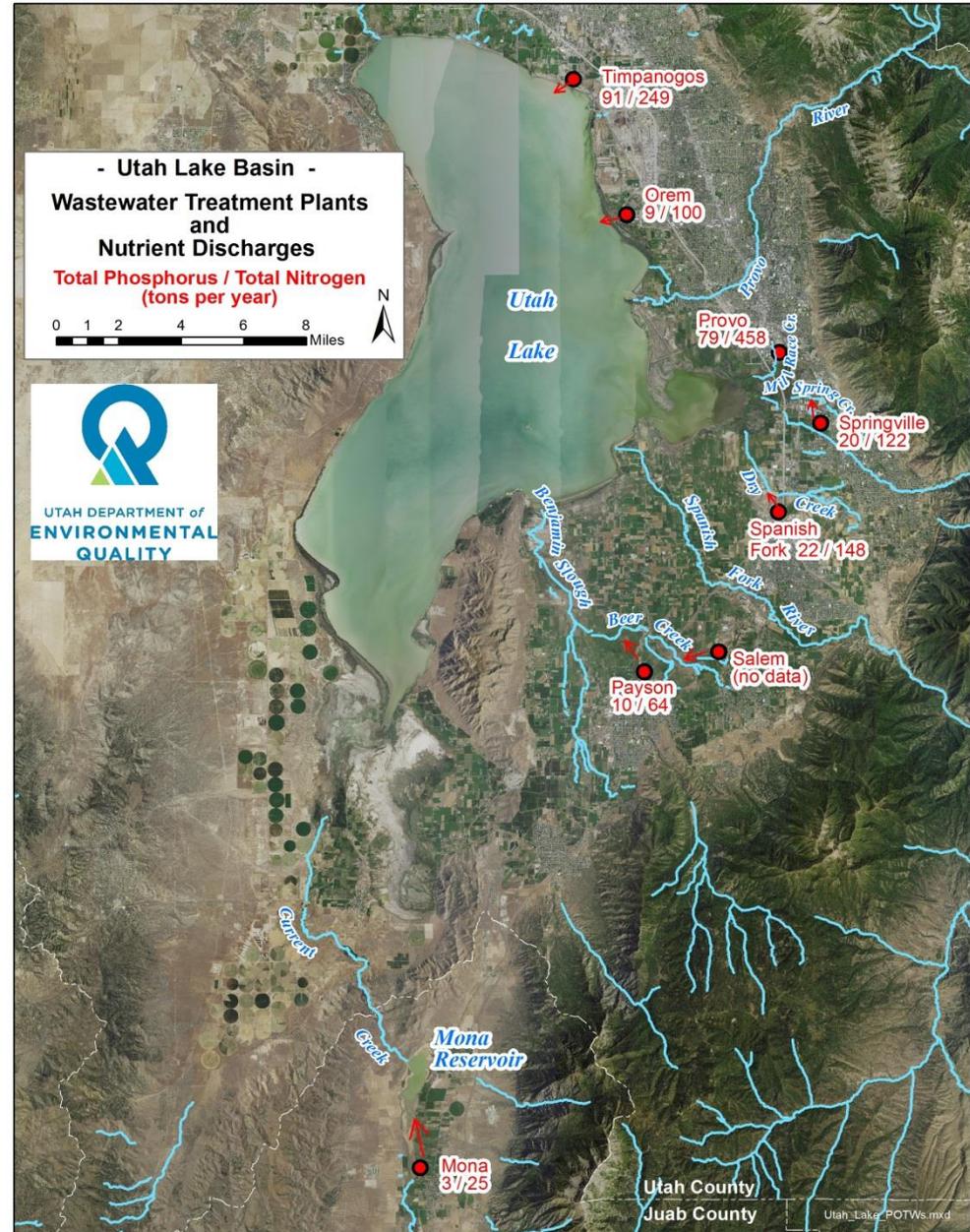


Multiplier effects of temperature & nutrients

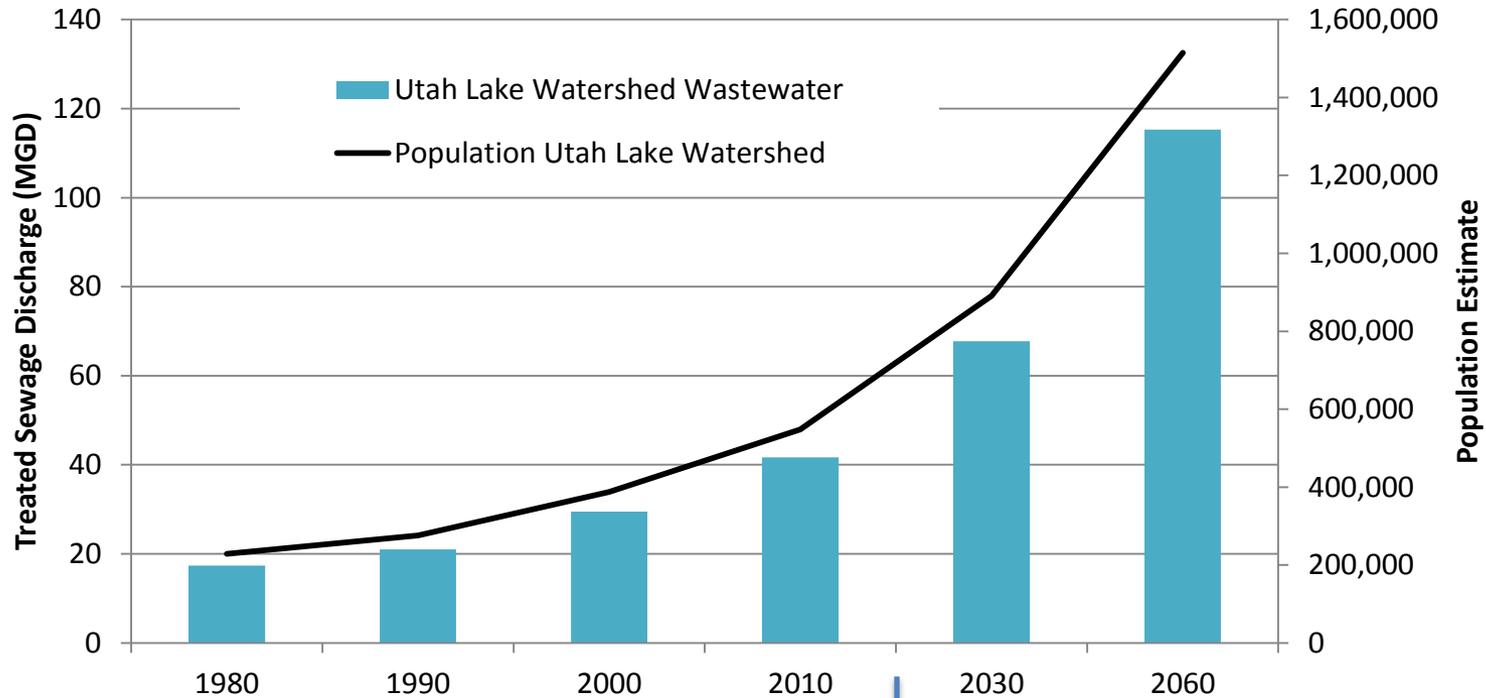


Nutrient Sources

- Publically owned treatment works (POTWs) (largest)
- Stormwater
- Agricultural runoff
- Natural background



Population Growth



Utah Secondary Standards

TBPEL

Utah Lake Basin: 176% Growth



Nutrient Reduction Success: Deer Creek Reservoir



Deer Creek Reservoir Algal Blooms (1970s)



Deer Creek Reservoir Algal Blooms (1990s)

Other Utah HABS

- Scofield Reservoir
- Payson Lakes (Big East, McClellan and Box lakes)





UTAH DEPARTMENT of
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HAB Links

[2016 Blooms Info](#)

[CDC: Health Information](#)

[Basics](#)

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[Guidance for Cyanobacteria](#)

[Health Effects](#)

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Algal Blooms 2016

Harmful algal blooms (HABs) occur when cyanobacteria multiply quickly to form visible colonies or blooms. These blooms sometimes produce potent [cyanotoxins](#) that pose serious health risks to humans and animals. Conditions during the summer of 2016, including low water levels, abundant sunlight, high nutrient levels, warm water temperatures, and calm waters, have led to numerous algal blooms in Utah waterbodies. These blooms have been unprecedented in their size, scope, and severity.

The Division of Water Quality (DWQ) will continue to conduct extensive sampling of these blooms to track their progress, identify the cyanobacteria species responsible for individual blooms, analyze cyanobacteria cell concentrations, test for cyanotoxins, and chart trends. DWQ provides state and local agencies, particularly local health departments, with sampling test results to assist these agencies in making determinations about lake closures, secondary water usage, and allowable recreational uses of affected waterbodies.

- [Farmington Bay](#)

Report a Bloom

If you suspect that you have seen a harmful algal bloom, **please call the 24-hour DEQ Spill Line: (801) 536-4123.**

Exposure

Individuals who believe they may be experiencing [symptoms from exposure](#) should contact the the [Utah Poison Control Center](#) at **(800) 222-1222** immediately. Pet owners concerned about their animals should contact their veterinarian. Veterinarians or members of the public who would like to know more about symptoms or appropriate tests for animals who may have been exposed to harmful algae or cyanotoxins can consult [these CDC materials](#) for

QUESTIONS

