



UTAH DEPARTMENT *of*  
ENVIRONMENTAL QUALITY

**WATER  
QUALITY**

# Nutrient and Harmful Algal Bloom Programs

NRAE Appropriations Subcommittee June 20, 2017  
Erica Gaddis, Assistant Director



# Utah's Nutrient Strategy

# Nutrient Pollution Threatens Utah Waters



Aquatic life



Aesthetics



Livestock



Recreation



Drinking Water

## Direct toxicity

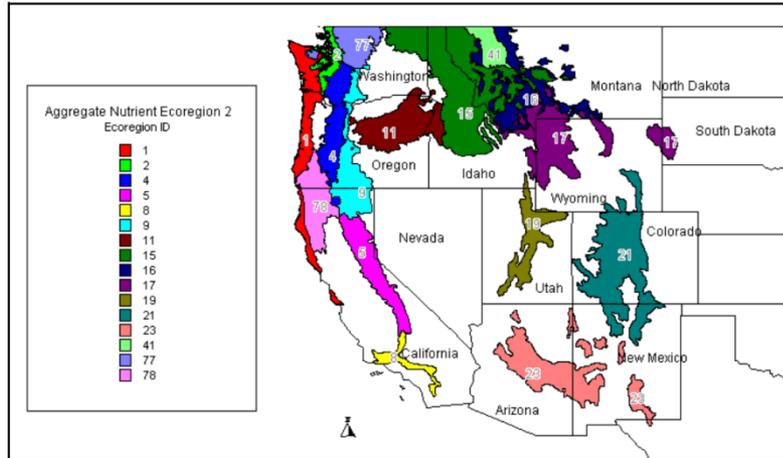
- High levels of nitrate cause blue baby syndrome
- Ammonia is directly toxic to aquatic life
- Cyanotoxins (Harmful Algal Blooms)

## Indirect effects

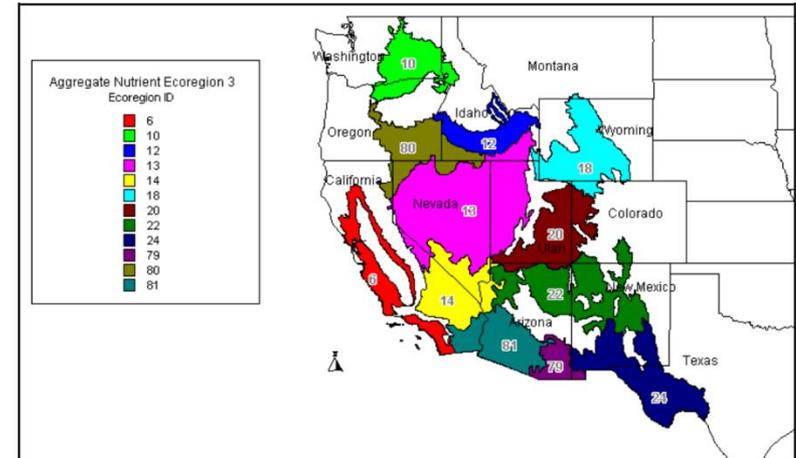
- In excess, robs waters of dissolved oxygen
- Results in nuisance conditions
- Affects taste and odor of drinking water

# EPA's Nutrient Criteria: 2002 - 2004

## Western Forested Ecoregion (II)



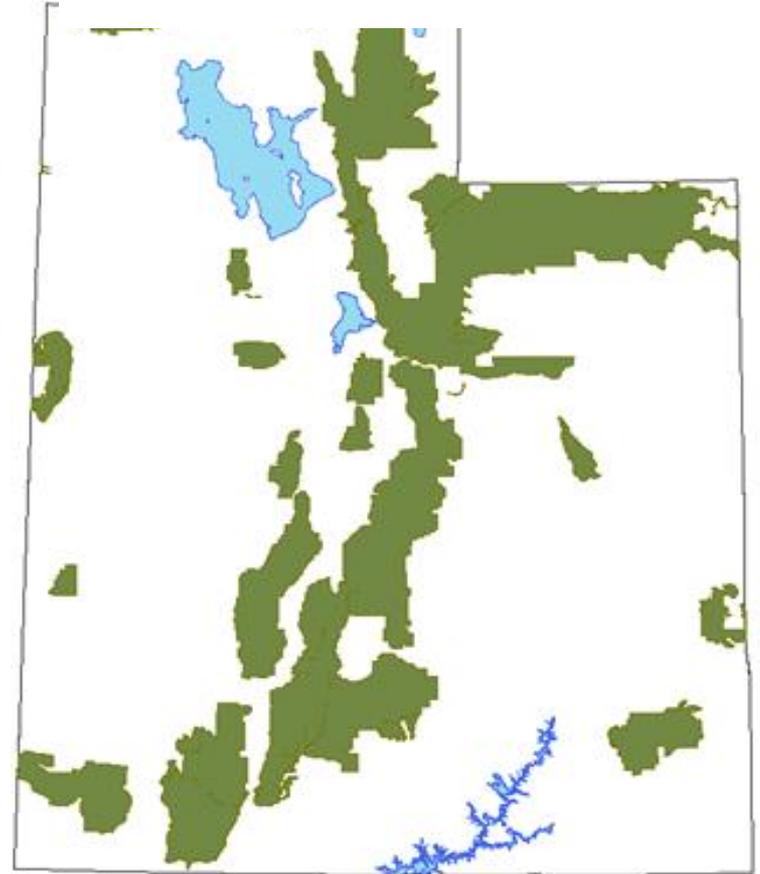
## Xeric West Ecoregion (III)



	Rivers and Streams		Lakes and Reservoirs	
	TP (mg/L)	TN (mg/L)	TP (mg/L)	TN (mg/L)
Western Forested Ecoregions (II) <i>Wasatch and Uintah Mountains (19)</i>	0.01	0.34	0.005	0.21
Xeric West Ecoregion (II) <i>Central Basin and Range Subcoregion (13)</i>	0.028	0.425	0.03	0.51
Xeric West Ecoregion (II) <i>Colorado Plateaus Subcoregion (20)</i>	0.02	0.553	0.003	0.15

# Utah's Nutrient Strategy

Headwater Numeric Nutrient Criteria  
to protect pristine waters

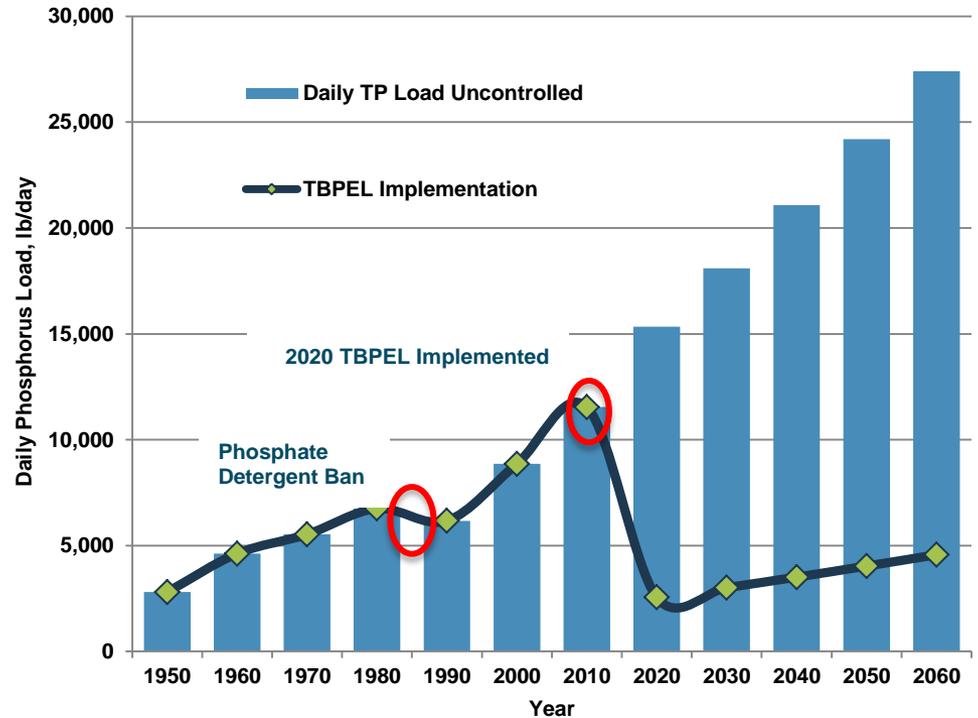


# Utah's Nutrient Strategy

Headwater Numeric Nutrient Criteria to protect pristine waters

“Hold the Line” state-wide on nutrients with Technology Based Phosphorus Effluent Limit of 1 mg/L by 1/1/2020

Utah Phosphorus Loading to State



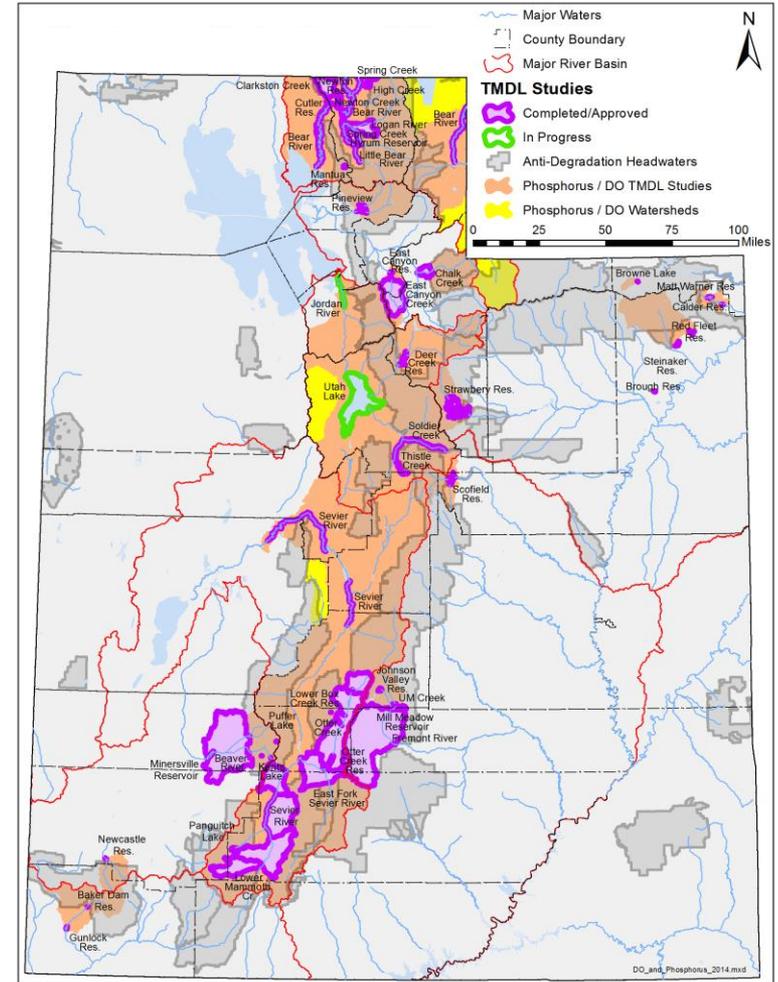
# Utah's Nutrient Strategy

Headwater Numeric Nutrient Criteria to protect pristine waters

“Hold the Line” state-wide on nutrients with Technology Based Phosphorus Effluent Limit of 1 mg/L by 1/1/2020

Develop site-specific nutrient standards for major waters

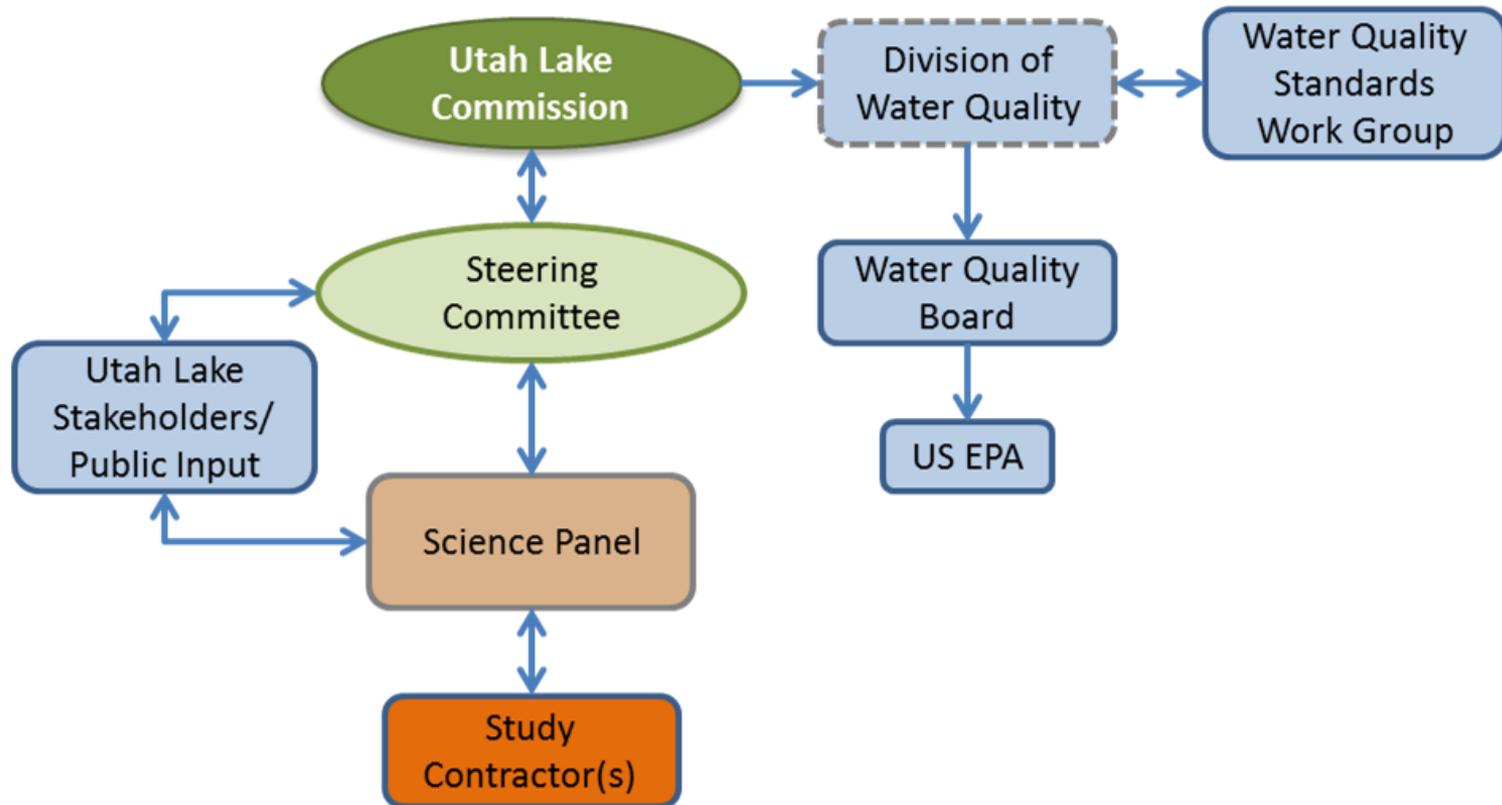
Continue nonpoint source project implementation



# Utah Lake Water Quality Study

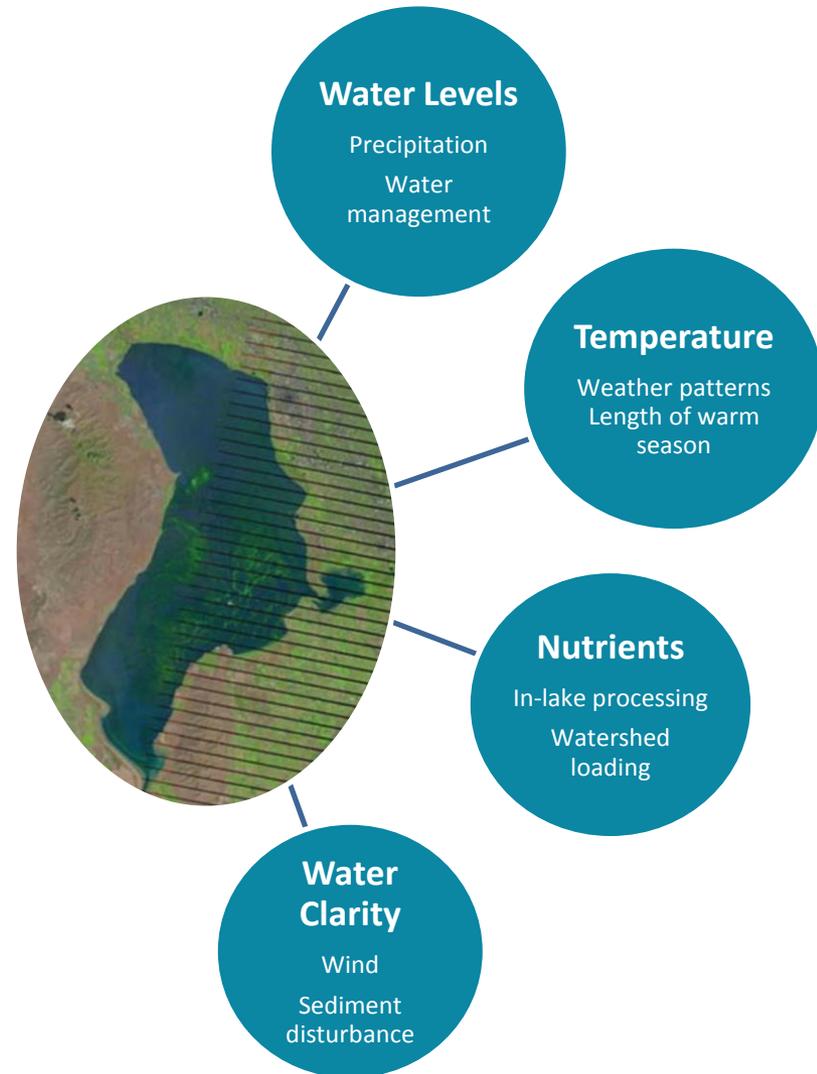
## Purpose:

Develop recommendations for any necessary in-lake water quality criteria that are protective of designated uses and sustain natural resources of Utah Lake



# Factors Contributing to Algal Blooms

- ❑ Increased nutrient pollution promotes development and persistence of harmful algal blooms
- ❑ Large HABs require external sources of nutrients to be sustained
- ❑ Reduction of nutrient inputs from watershed sources can significantly reduce HAB frequency and magnitude



Heisler et al., 2008. *Eutrophication and harmful algal blooms: A scientific consensus*



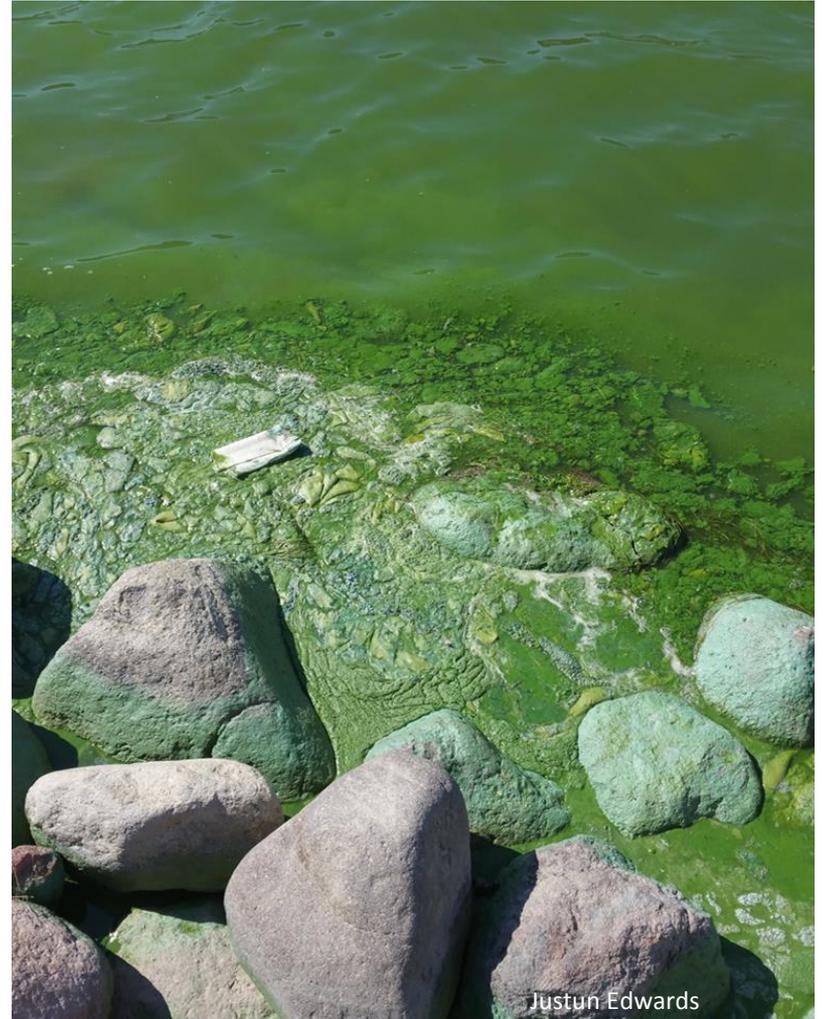
# Harmful Algal Bloom Program

# 2016 Harmful Algal Blooms



Ksl.com

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



Justin Edwards

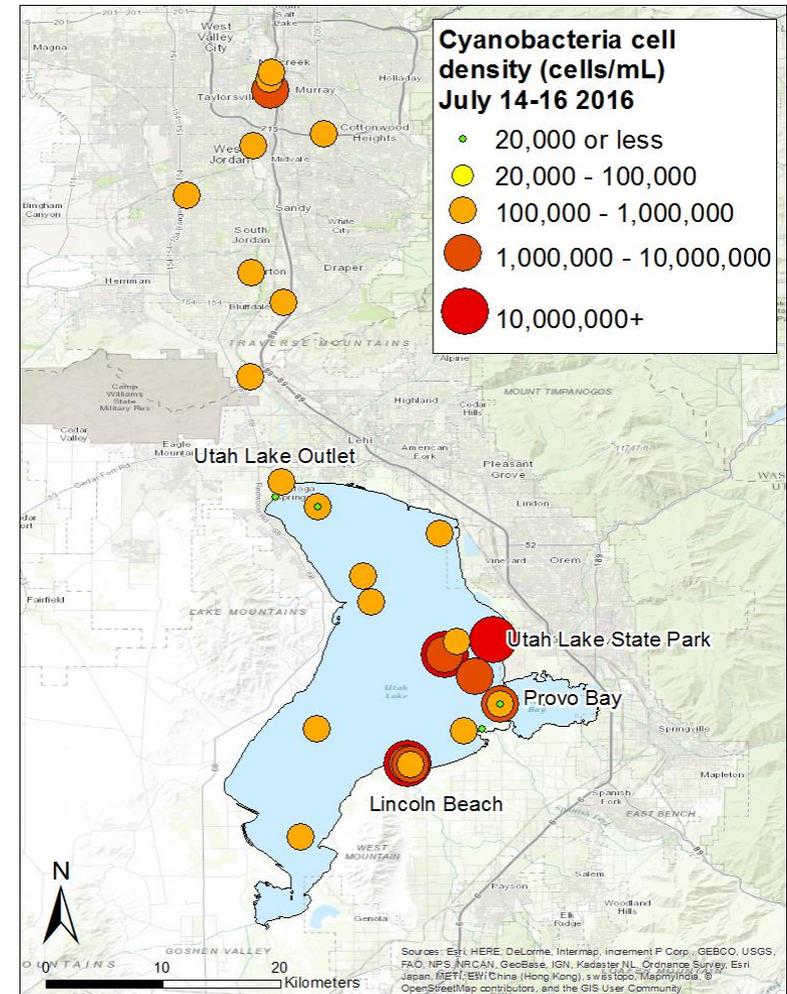
# Scotfield Reservoir



- Fish kill
- Bat and bird mortalities
- Threatened Price City drinking water intake

# Utah Lake

- Bloom from July – September 2017
- Utah Lake closed for 9 days
- 200+ symptomatic cases reported to Utah Poison Control Center
- Toxins generally low with the exception of southern shores



# Utah Lake – Jordan River – Great Salt Lake



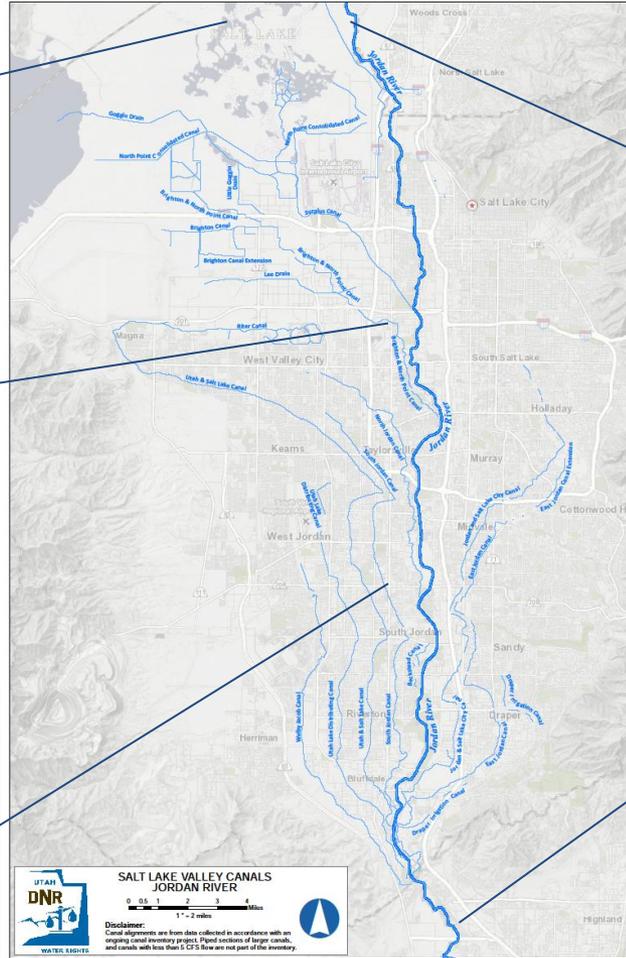
Farmington Bay



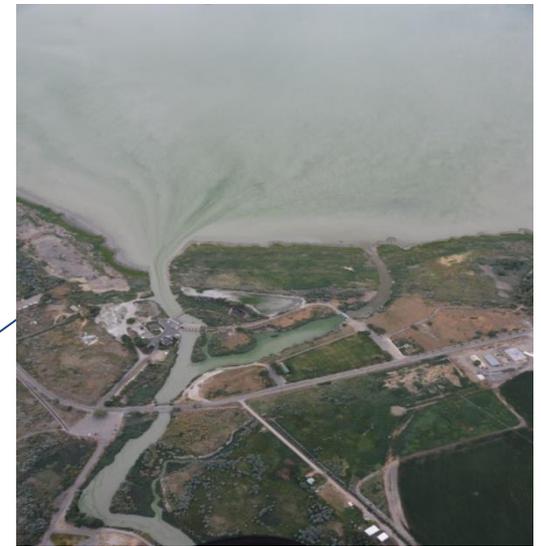
Wetlands and Ponds



Jordan River



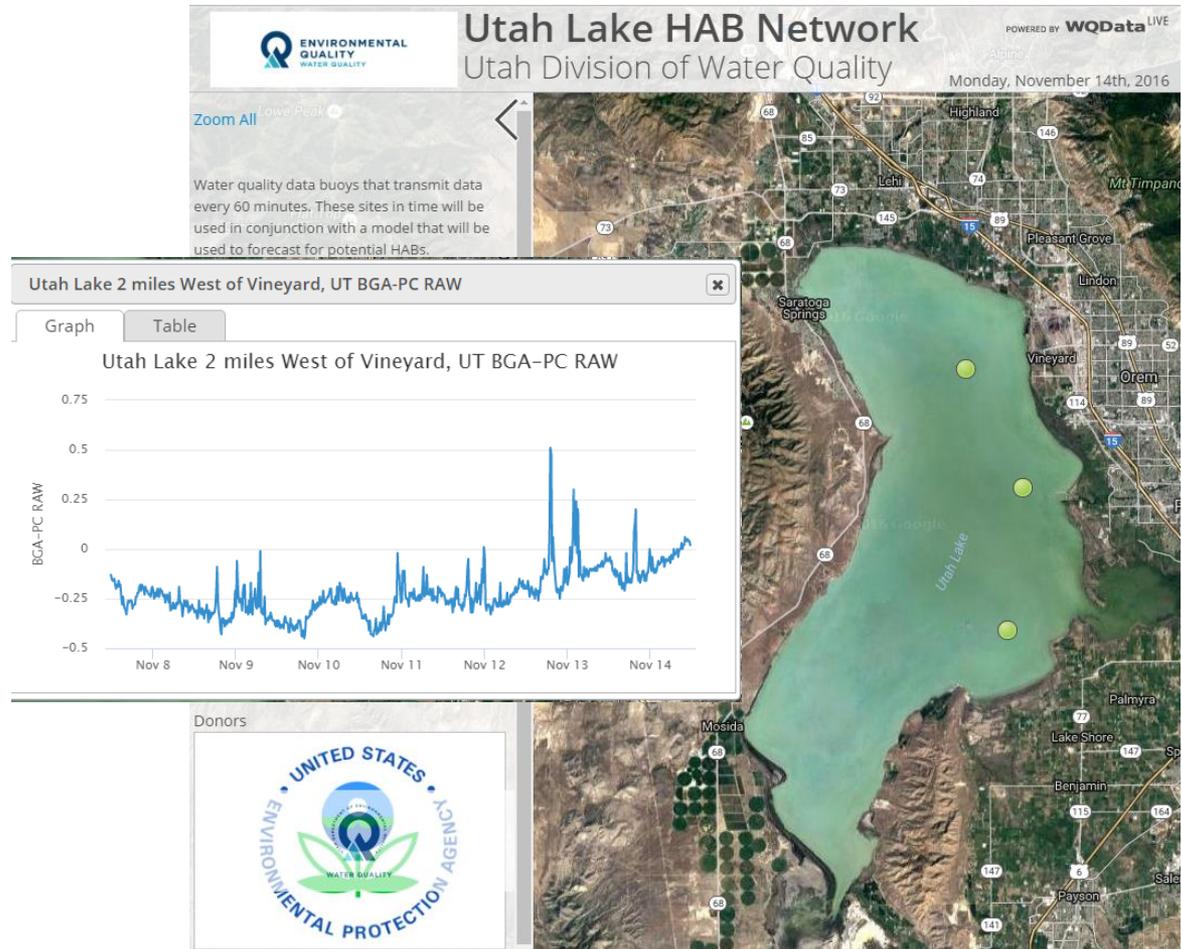
Impounded Wetlands



Utah Lake

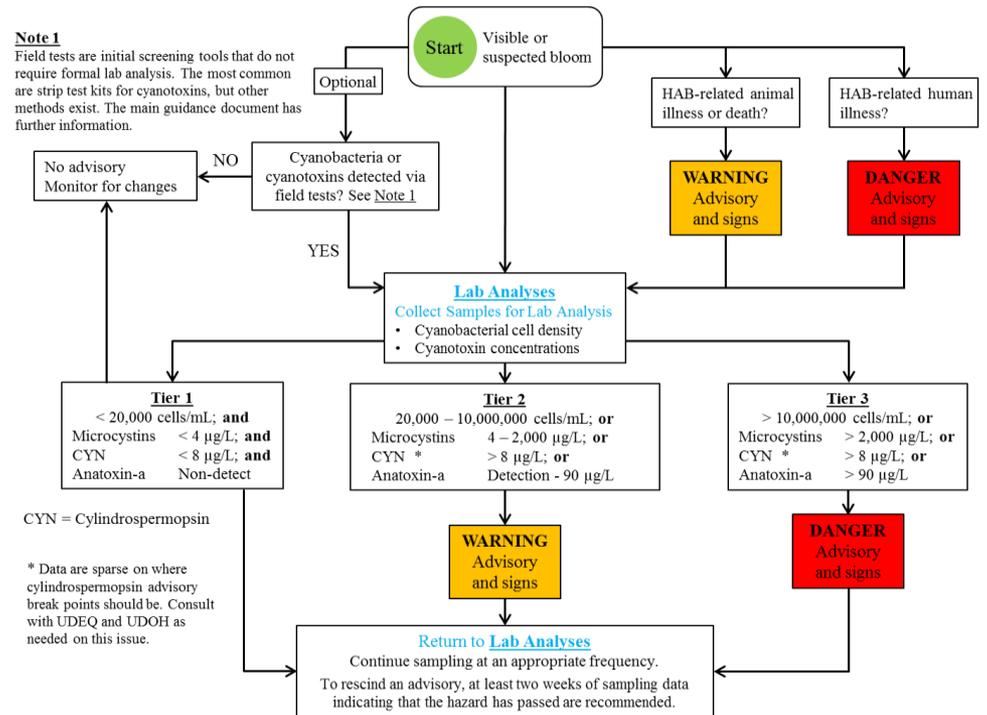
# 2017 HAB Preparedness

- Early warning system in high risk waters
- New testing capability in-state at Utah Public Health Laboratory



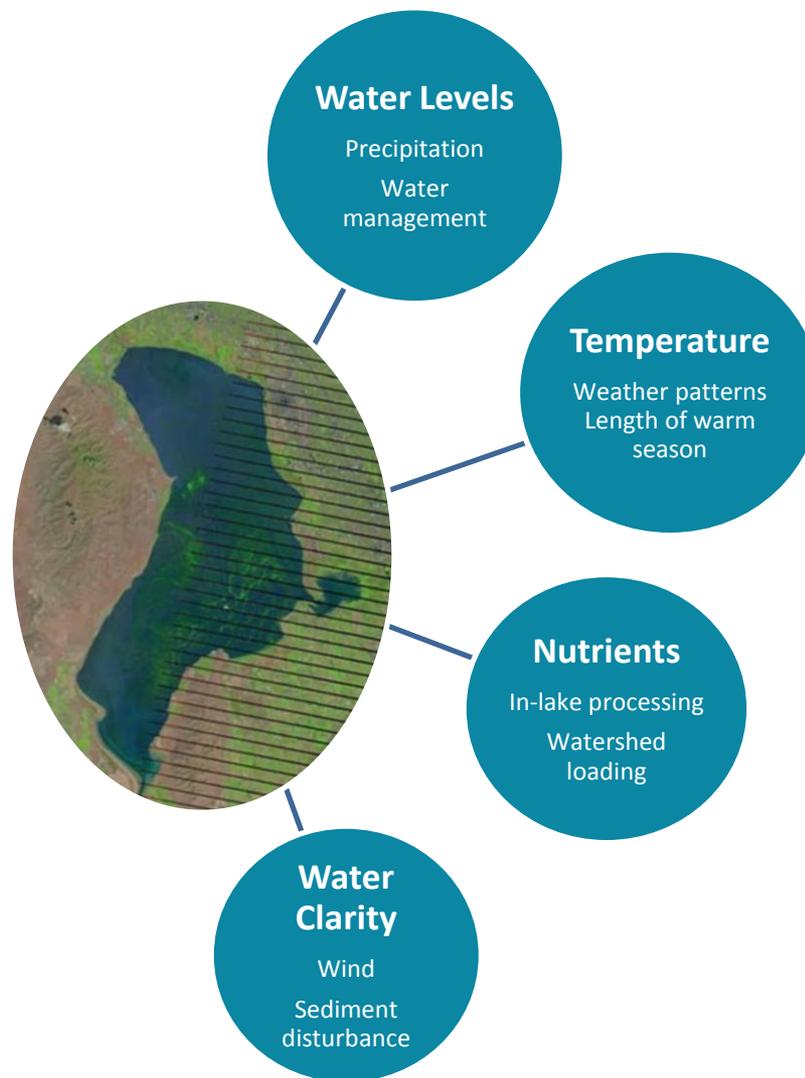
# 2017 HAB Preparedness

- Early warning system in high risk waters
- New testing capability in-state at Utah Public Health Laboratory
- Updated guidance for local health departments
- Coordinated planning for response across multiple local agencies and state departments:
  - Environmental Quality
  - Natural Resources
  - Agriculture and Food
  - Health
  - Public Safety



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# QUESTIONS

