

Harmful Algal Blooms

July Water / Wastewater Commission

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Agenda

- Background – Algae in the Highland Lakes
- Source water sampling and monitoring
- Austin Water analytical strategies
- Austin Water Harmful Algal Bloom (HAB) mitigation strategies and treatment readiness



Algae in the Highland Lakes

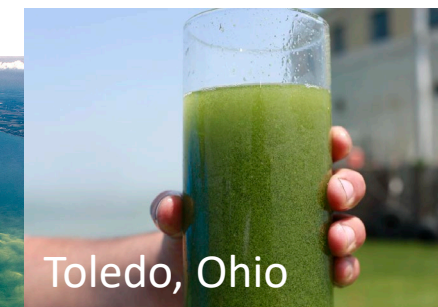
- Composed of photosynthesizing bacteria (cyanobacteria)
 - a.k.a. “blue-green algae”
 - common in natural water
 - some types produce toxic compounds (cyanotoxins)
- Contributing Factors
 - Warm water
 - Low or stagnant flow
 - Abundance of nutrients



Planktonic vs. Benthic Algae

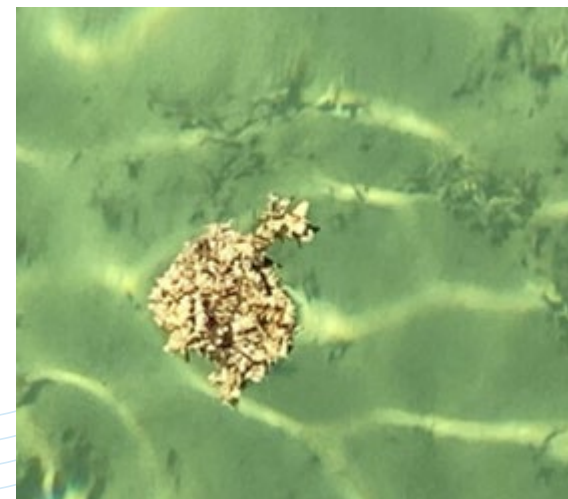
💧 Planktonic blooms

- Free floating microscopic cells
- Suspended in the water column or floating as scum on surface



💧 Benthic proliferations

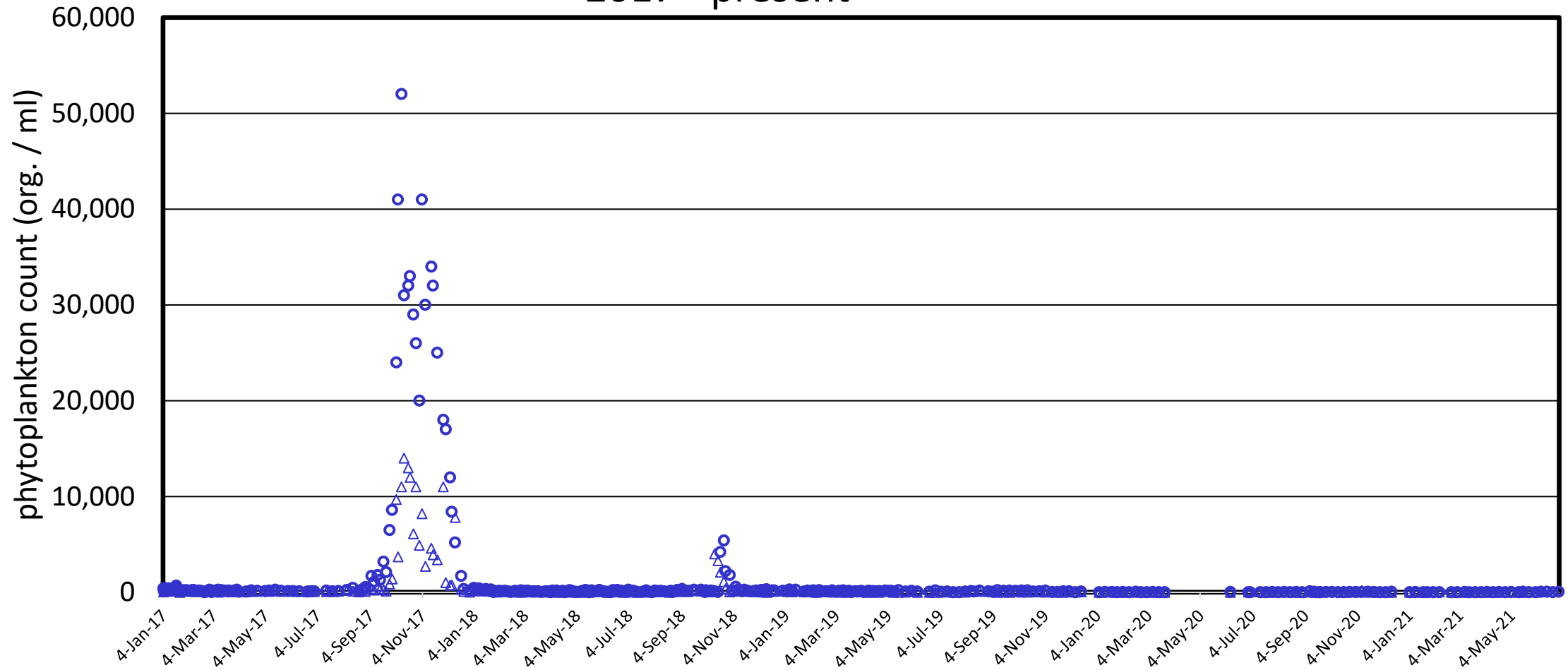
- Originate on bottom of lake in shallow water
- Globbs or mats remain on the bottom or float to the surface



Detecting a HAB:

- Routine plankton counts at WTP intakes
 - Focus on blue / green totals
 - Observe trending
 - Adjust monitoring frequency based on current conditions
- Continuous exchange of information
 - Watershed Protection Department
 - Lower Colorado River Authority

Blue Green Phytoplankton Count 2017 - present



Cyanotoxin Monitoring: History

- 💧 Cyanotoxins are unregulated
 - No maximum contaminant levels (MCLs) established by EPA
- 💧 Austin Water first sampled in 2015
 - Detected cylindrospermopsin (just above detection) at WTP intakes
 - No other cyanotoxin “detects” in Austin Water monitoring history
- 💧 Unregulated Contaminant Monitoring Rule (UCMR) sampling in 2019 (all non-detect)



Cyanotoxin Monitoring: 2021

- 💧 Biweekly sampling since February 2021
- 💧 Collected at intake and tap at all 3 plants
- 💧 All results non-detect

LCRA Monitoring

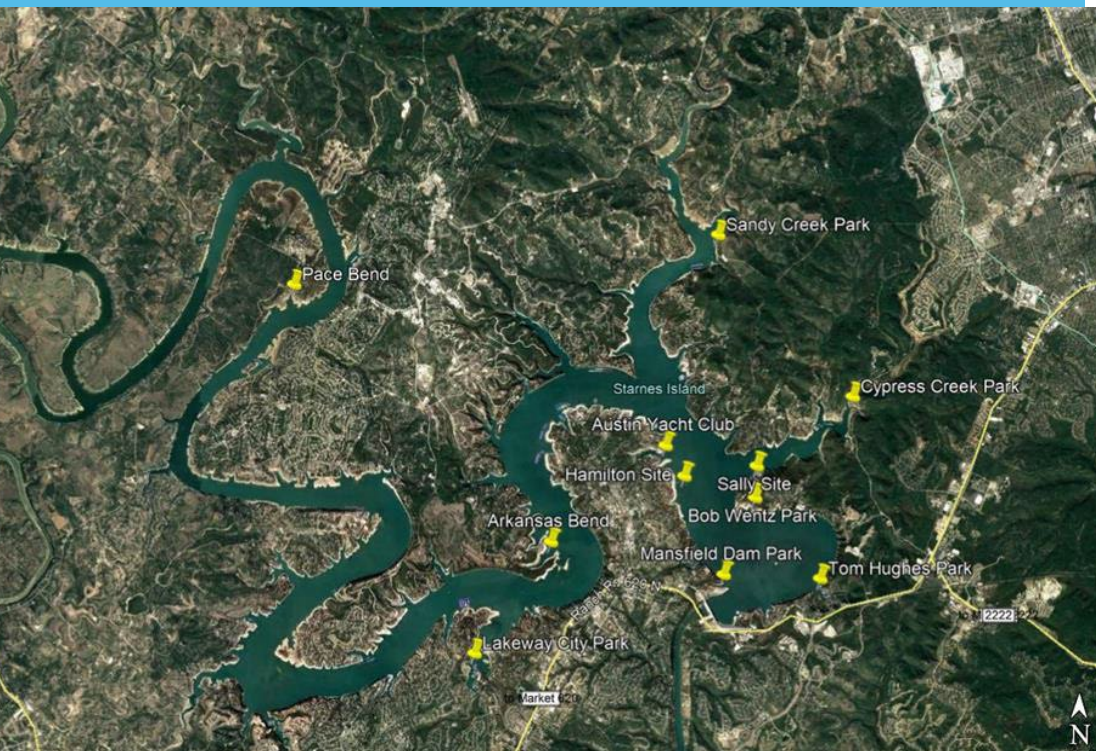


Biweekly at Hudson Bend

- Dihydroanatoxin detected *in water* in Mid-March
 - Levels just above detection
- All water samples non-detect since then

Sampled 12 sites in Late March

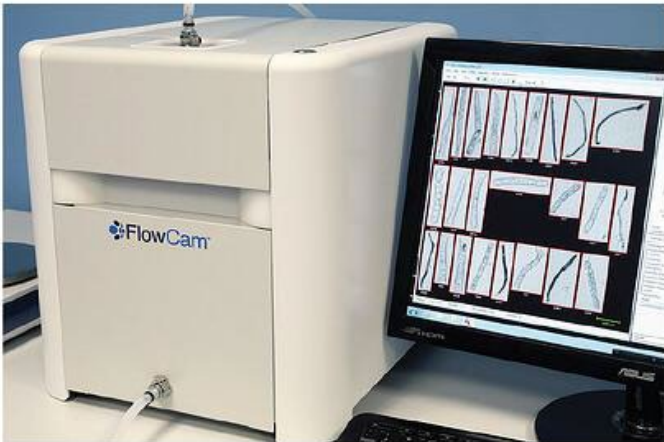
- Dihydroanatoxin detected *in the water* at 4 sites
 - Levels just above detection
- Future sampling
 - Deploying SPATT bags at multiple reservoirs
 - Above the dam at each reservoir



Watershed Protection Department Monitoring

- Biweekly sampling
 - Ladybird Lake (3 sites)
 - Lake Austin (3 sites)
 - Cyanotoxins detected in algae only





Austin Water Analytical Strategies

- Weekly algae counts
 - Evaluate trends
 - Compare against published triggers
- FloCam purchase (July Commission)
- Biweekly cyanotoxin sampling (contract lab)
- Developing ELISA method at AW Water Quality Lab
 - Quicker turnaround at a lower cost
 - Method still in development



Harmful Algal Bloom Mitigation Strategies



- ♦ Adjusting monitoring frequency based on conditions
- ♦ Utilizing available AWWA resources
- ♦ Reviewing existing literature
- ♦ Coordinating with other agencies (APH; Watershed; LCRA; HSEM)
- ♦ Developing communications plans
- ♦ Evaluating effectiveness of treatment and operational options
- ♦ Participating in Water Research Foundation (WRF) study

Water Treatment Plant Readiness



- EPA preferred method – conventional treatment
- Additional treatment methods – PAC and oxidation
- Retrofitting for additional chemical capabilities
- Ongoing testing to confirm effectiveness of treatment methods
- Engage consultants for guidance and broader perspective





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