Ohio EPA Update
OTCO Compliance Workshop
October, 2016

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DDAGW

Ohio Environmental Protection Agency

Topics

- Well Standards and Plan Approval
- Lead
- Harmful Algal Blooms (HABs)

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Well Standards & Plan Approval

- Major revisions to rules (effective June 2016)
  - Clarifying nonpotable well requirements.
  - Revising step drawdown and constant rate testing requirements to ensure accurate evaluation of well productivity.
  - Updating AWWA standard C654, Disinfection of Wells to 2013 version.
  - Updating technical documents that are rule by reference.
  - Adding plan approval exemptions for hauled water systems, and for small ground water systems installing ion exchange water softeners and cartridge filters.

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HB 512 - Lead

Ohio Environmental Protection Agency

Strong Need for Change Identified

TRANSFORMING OHIO
FOR JOBS + GROWTH
2016 MID-BIENNIUM REVIEW

The federal framework that guides states in protecting the public against exposure to lead in their drinking water is flawed and the Kasich Administration is working with Ohio's congressional delegation to seek changes in Washington. Here at home, the governor's Mid-Biennium Review proposes new funding mechanisms to help communities replace lead water lines and help schools replace old drinking fountains and other lead-based fixtures. Stronger state standards – backed by tighter deadlines and administrative fines – will make public water systems notify and educate the public in a much timelier manner.

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House Bill (HB) 512

- Sponsored by Timothy E. Ginter
- Passed the House 5/11/2016 unanimously
- Passed the Senate 5/25/2016 unanimously
- Signed 6/9/2016 in Columbiana
- Bi-Partisan support
- OEC gave Proponent Testimony

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HB 512

- Lead Free adopted
- Effective September 9, 2016
- Ohio EPA has 120 days from effective date of law to write revised lead and copper rules
- Some requirements effective September 9
- Some requirements for water systems 6 months after effective date

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HB 512

- Mapping – Due early March
- CWS – identify and map areas likely to have lead service lines and characteristics of buildings that may contain lead piping, solder or fixtures
- NTNCWS – identify and map areas with lead piping, solder or fixtures in building
- Copy of the map to LHD and ODJFS

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HB 512

- Submit map to Ohio EPA
- Must contain Tier 1 sites being used and contact information for owner and/or occupant
  - Part of notification requirements
- Update map every 5 years

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HB 512

- By Rule:
- Limits PWS that can be on triennial monitoring:
  - Age of water system
  - Are corrosion control requirements are met?
- Require a new or updated corrosion control treatment study and plan not later than eighteen months after if:

  (a) change or addition of source.

  (b) substantial change in water treatment.

  (c) operate outside of acceptable ranges for lead, copper, pH, or other corrosion indicators.

  (d) Any other event determined by the director to have the potential to impact the water quality or corrosiveness of water in the system.

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HB 512 – Effective September 9

Lead Action Level Exceedance (ALE):

- PWS has 2 business days provide notice to all customers
- Verify performed within 5 days to Ohio EPA
  - "Verification of Lead Consumer Notice Issuance" form on DDAGWs reporting web page
- PWS has 5 business days provide information on tap water testing to customers likely to have lead service lines, pipes or solder

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HB 512 – Effective September 9

Lead Action Level Exceedance (cont.):

- Director to perform notification if not done by the PWS in 10 business days
- PWS has 30 business days provide public education
- **Establishes penalties for failure to notify consumers**

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Interim Lead Notification

- Notification that can be issued by the system to warn public of corrosive conditions in drinking water that may be of concern for lead exposure prior to the end of the monitoring period, but not yet an actual ALE determination
- Health effects language in the Interim Lead Notification will be very similar to ALE public notification (template coming)
  - No public education requirements
- A PWS may decide that they would rather declare an ALE

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HB 512 – Effective September 9

Individual tap results:

- PWS provides notice within 2 business days of individual tap results to consumer;
  - Additional requirements if over 15 ug/L
- Verify notification to Ohio EPA within 5 business days
  - "Verification of Lead Consumer Notice Issuance" form on DDAGWs reporting web page

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HB 512 – Effective September 9

Individual tap results (cont):

- Director to perform notification if not done by the PWS in 10 business days
- **Establishes penalties for failure to notify consumers**

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Additional PWS Requirements for Individual Tap Results over 15 ug/L

- Provide consumer with information on health screening and lead blood level testing in 2 business days
- Provide results to the local health department in 2 business days
- Include results in CCR
- NTNCWS – immediately remove the fixture from service

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Electronic Reporting by Lab

- Outreach to Labs via Webinar
- PWS must provide detailed location information with sample submission
  - Specific, full mailing address in “Collection Address” field
  - Phone number and email address of resident in “Comments” field
- Coming soon….
  - Sample Monitoring Point IDs for each specific Pb and Cu sampling location, linked to a specific address
    - Similar to TTHM/HAA5 (DS201, DS202, etc)

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Lead - USEPA

- Proposing rule 2017
- Interim requests to Governors and Directors
- Tracking all ALEs
- Posting all results
- Sampling protocols
- Tier 1 sample determinations

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Harmful Algal Blooms (HABs)

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Summary of Ohio HAB Response

2010: The beginning…

2011: Ohio HAB Response Strategy

- Record-setting Lake Erie bloom

2013, 2014: Finished water exceedance at PWSs

2015: U.S. EPA issued health advisory levels

- Finished water microcystins detections at five PWSs
- Ohio Senate Bill 1 passed in July
- Ohio EPA began developing rules
- Ohio River 600 mile HAB

2016: HAB Monitoring and Reporting Rules

- Effective June 1, 2016
- Updated response strategies and created treatment optimization and general plan guidance for PWSs

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July 2015 Ohio Lawmakers Pass SB 1
Key Drinking Water Provisions

- Ohio Revised Code 3745.50
- Director Ohio EPA - HAB management and response Coordinator
- Develop and implement protocols and actions including:
  - Analytical protocols
  - Health advisories
  - Public notification protocols
  - Training, testing, treatment and other support
  - Reporting requirements

Image courtesy of the Capitol Square Review and Advisory Board

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HAB Rules – Overview
Effective June 1, 2016

- PWS requirements - new rules in OAC Chapter 3745-90
  - Microcystins action levels in drinking water
  - Monitoring requirements
  - Treatment technique requirements
  - Public notification and Consumer Confidence Report (CCR) requirements
  - Recordkeeping requirements
- Laboratory Certification requirements – new OAC rule 3745-90-04 and amended rules in Chapter 3745-89

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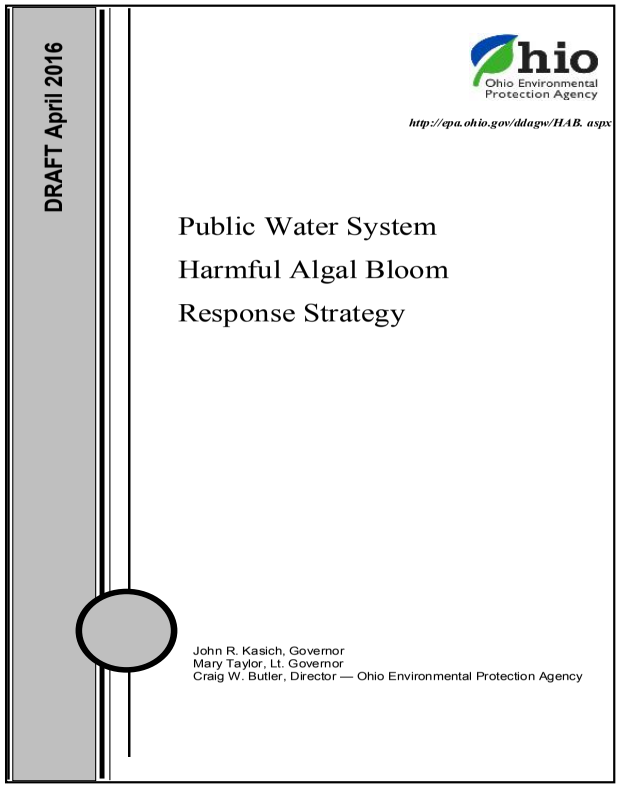
2016 PWS HAB Strategy

- Incorporate new HAB rules
- Drinking water thresholds
- Monitoring strategy
  - Ohio EPA response to qPCR screening
- Response to finished water exceedances



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Ohio Numerical Cyanotoxin Thresholds for Drinking Water

Drinking Water Thresholds	Microcystins (µg/L)	Anatoxin-a (µg/L)	Cylindrospermopsin (µg/L)	Saxitoxins (µg/L)
Do Not Drink – children under 6 and sensitive populations	0.3	20	0.7	0.3
Do Not Drink – children 6 and older and adults	1.6	20	3.0	1.6
Do Not Use*	20	300	20	3

Page 11 – 2016 Ohio PWS HAB Response Strategy

Microcystins = Action Level in Ohio Rule
Other cyanotoxins = Threshold in PWS Response Strategy

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Monitoring Requirements

- Total Microcystins

  May – October

  – Weekly raw and finished water
  – Raw water detections >5 ug/L and any finished water detections trigger additional sampling

  November – April

  – Raw water only every other week
  – Detections trigger additional monitoring

- Cyanobacteria Screening

  All year

  – Biweekly raw water
  – Triggers follow up sampling by Ohio EPA for other cyanotoxins

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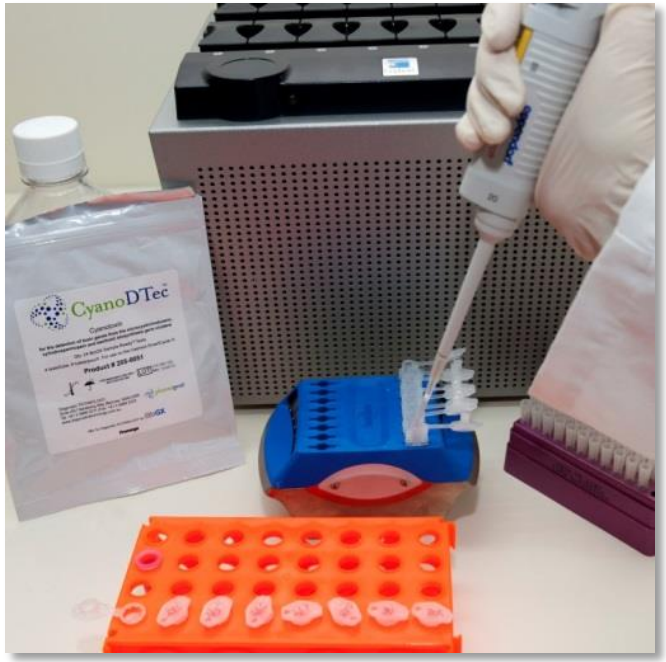
Cyanobacteria Screening: qPCR

- qPCR = Quantitative polymerase chain reaction
  - Identify total cyanobacteria and cyanotoxin producing genes
  - Biweekly sampling at all PWS
  - Tells us when other toxins may be present
  - Ohio EPA conducting all analysis
  - Ohio EPA to respond based on results



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Response to Microcystin Detections

- **Raw water > 5 ug/L** = increase monitoring to 3 days/week
- **Finished water detect** = increase to daily monitoring
  - Ohio EPA initiate immediate response with PWS
- **Finished water detect exceeds Action Level** = Resample and Repeat Sample
  - Notification to state agencies (EMA Watch Desk)
- **Resample** or **Repeat** samples exceed the action level:
  - PWS notifies consecutive systems, collects distribution samples
- **Repeat** sample exceeds the action level:
  - PWS conduct public notification

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Response to Cyanobacteria Screening

- **Response described in HAB Response Strategy**
- **Gene detection (saxitoxin or cylindrospermopsin)**
  - Ohio EPA conduct cyanotoxin monitoring (raw and finished)
- **Finished water detections or increase in raw toxins**
  - Increased monitoring to 2x/week
  - Optimize treatment and evaluate reservoir management options
- **Finished water detection**
  - OEPA conduct treatment train sampling
  - Levels < 50% threshold = 2X/week monitoring
  - Levels ≤ 50% of threshold = daily monitoring
  - Exceed threshold = potential advisory and PN

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Treatment Technique Requirements

- **Treatment Optimization Protocol** (short term)
  - Microcystins detected in raw or finished water
  - Optimize existing treatment
  - 46 triggered to date
- **Cyanotoxin General Plan** (long term)
  - Microcystins detected in finished water or raw at high levels
  - Holistic assessment of treatment effectiveness and needs
  - Source water protection, reservoir management and in-plant treatment
  - 2 triggered to date

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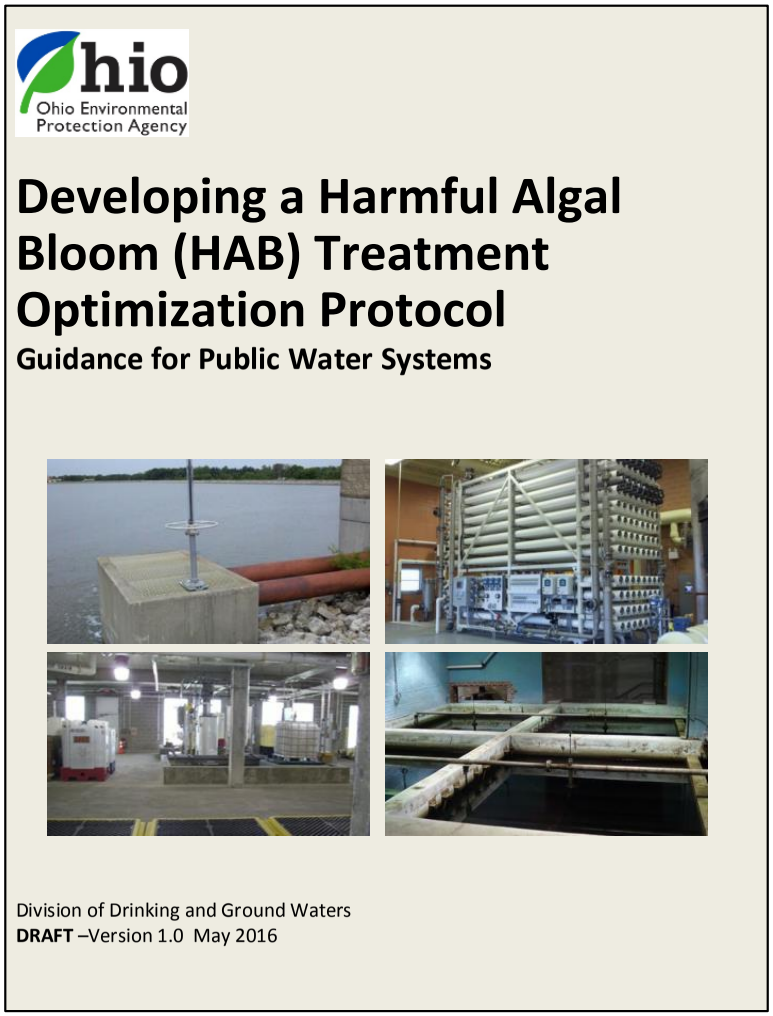
Treatment Optimization Guidance

http://epa.ohio.gov/ddagw/HAB.aspx



May 2016

Recommendations

- cyanotoxin is primarily INTRAcellular (inside cyanobacteria cell) and conventional treatment can be optimized to enhance intact cell removal
- cyanotoxin is primarily EXTRAcellular (outside of cyanobacteria cell) and conventional treatment is generally ineffective at toxin removal

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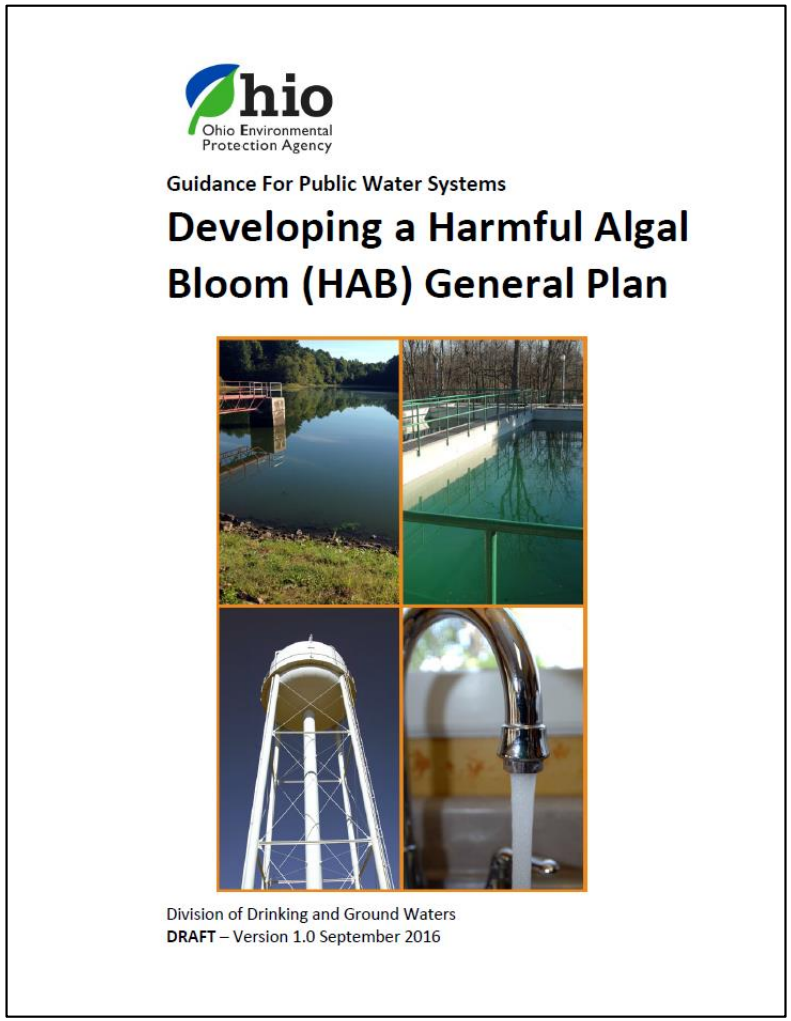
HAB General Plan Guidance

http://epa.ohio.gov/ddagw/HAB.aspx



September 2016

Plan should include a combination of the following:

- source water protection activities;
- avoidance strategies;
- reservoir management; and/or
- addition of new treatment processes or enhancement of existing processes.

Must also include:

- schedule for implementation
- or a demonstration that existing practices are sufficient.

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Preliminary Findings: Microcystins
(through September 2016)

- 100% compliance with rules
- Microcystins detected in raw water at 39 PWS (32% of surface water systems)
- No finished water microcystins detections

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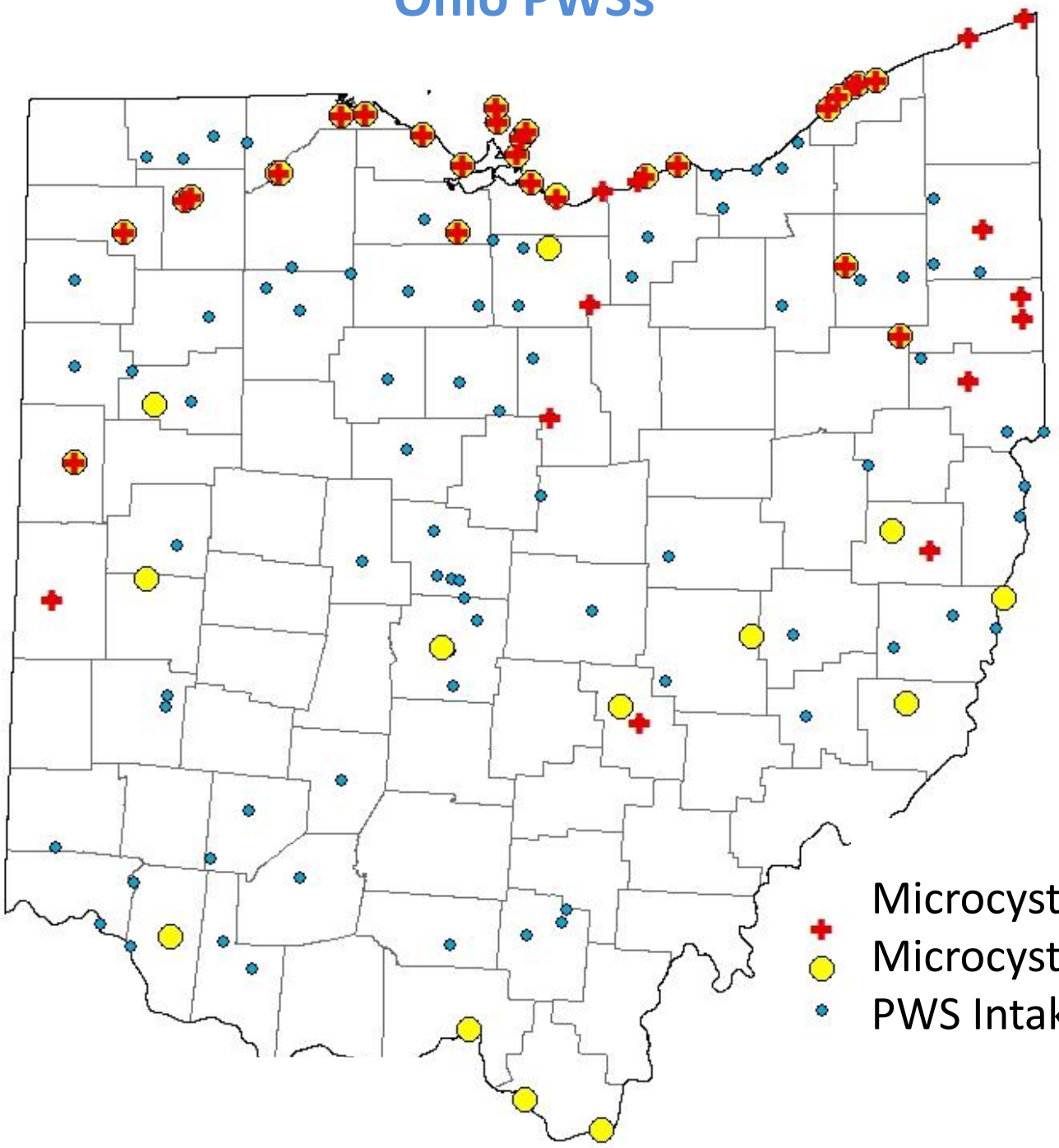
Source Water Microcystins Detections at Ohio PWSs



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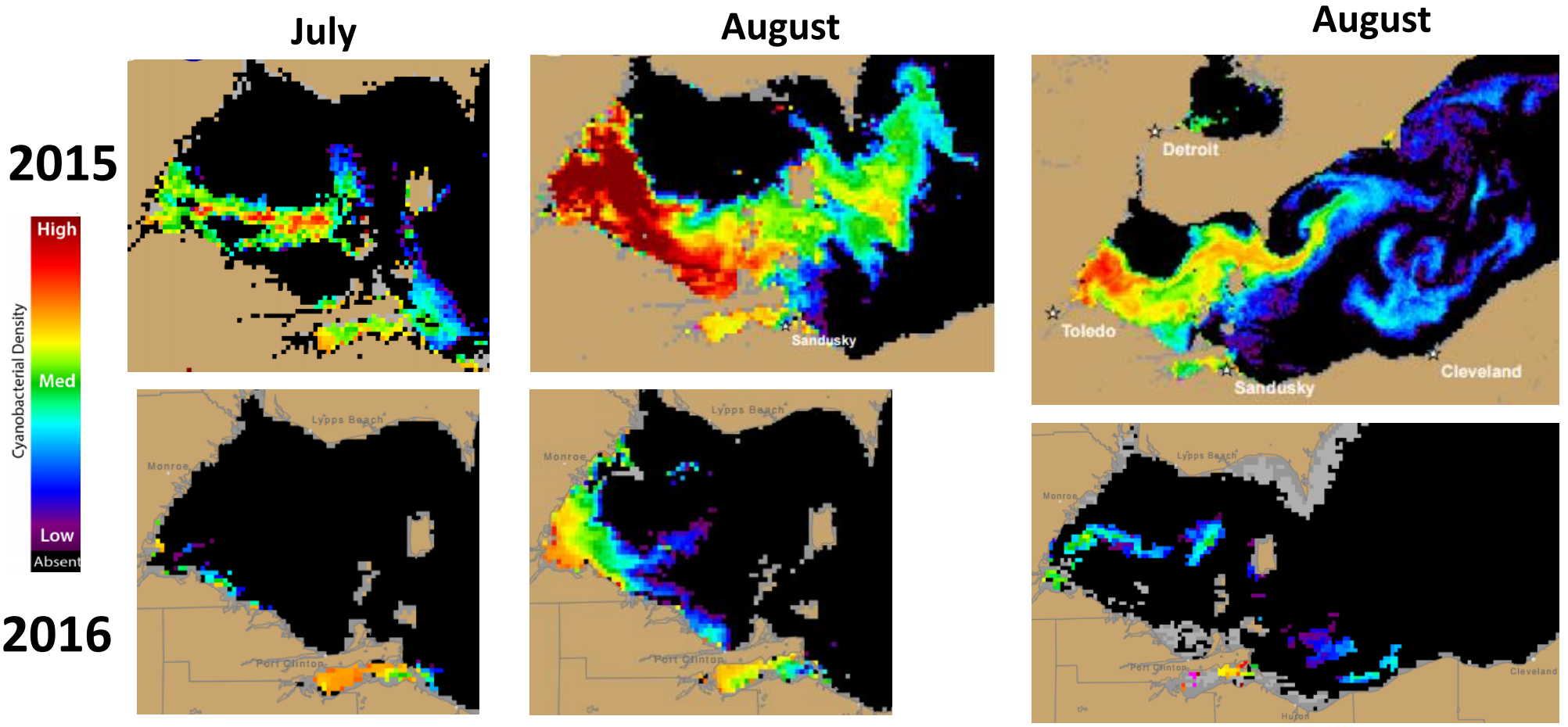
Lake Erie HAB Comparison 2015 and 2016



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Preliminary Findings: Saxitoxins & Cylindrospermopsin

(through September 2016)

- Saxitoxins
  - 33 PWSs detected saxitoxin (sxtA) genes in source water (27% of surface water systems)
  - 15 of those PWSs detected saxitoxins in their source water (12%)
  - 5 PWSs detected saxitoxins in finished water; No detections above Ohio EPA thresholds
- Cylindrospermopsin
  - 1 PWS detected cylindrospermopsin (cylA) gene in source water
  - No raw or finished water detections of cylindrospermopsin

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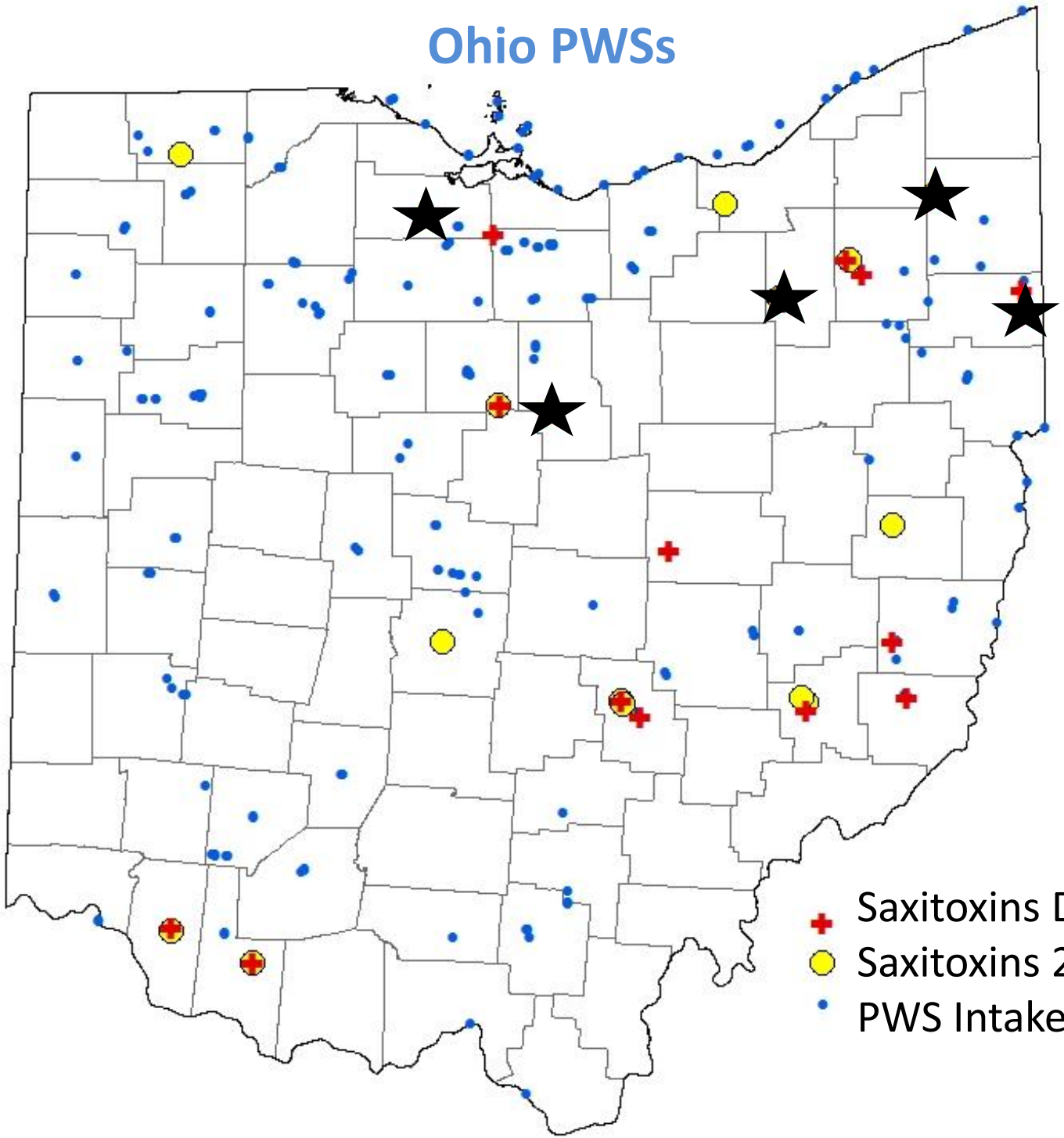
Source Water Saxitoxins Detections at Ohio PWSs



Finished Water Saxitoxins Detections (below threshold)

Saxitoxins Detections 2016

Saxitoxins 2010-2015

PWS Intakes

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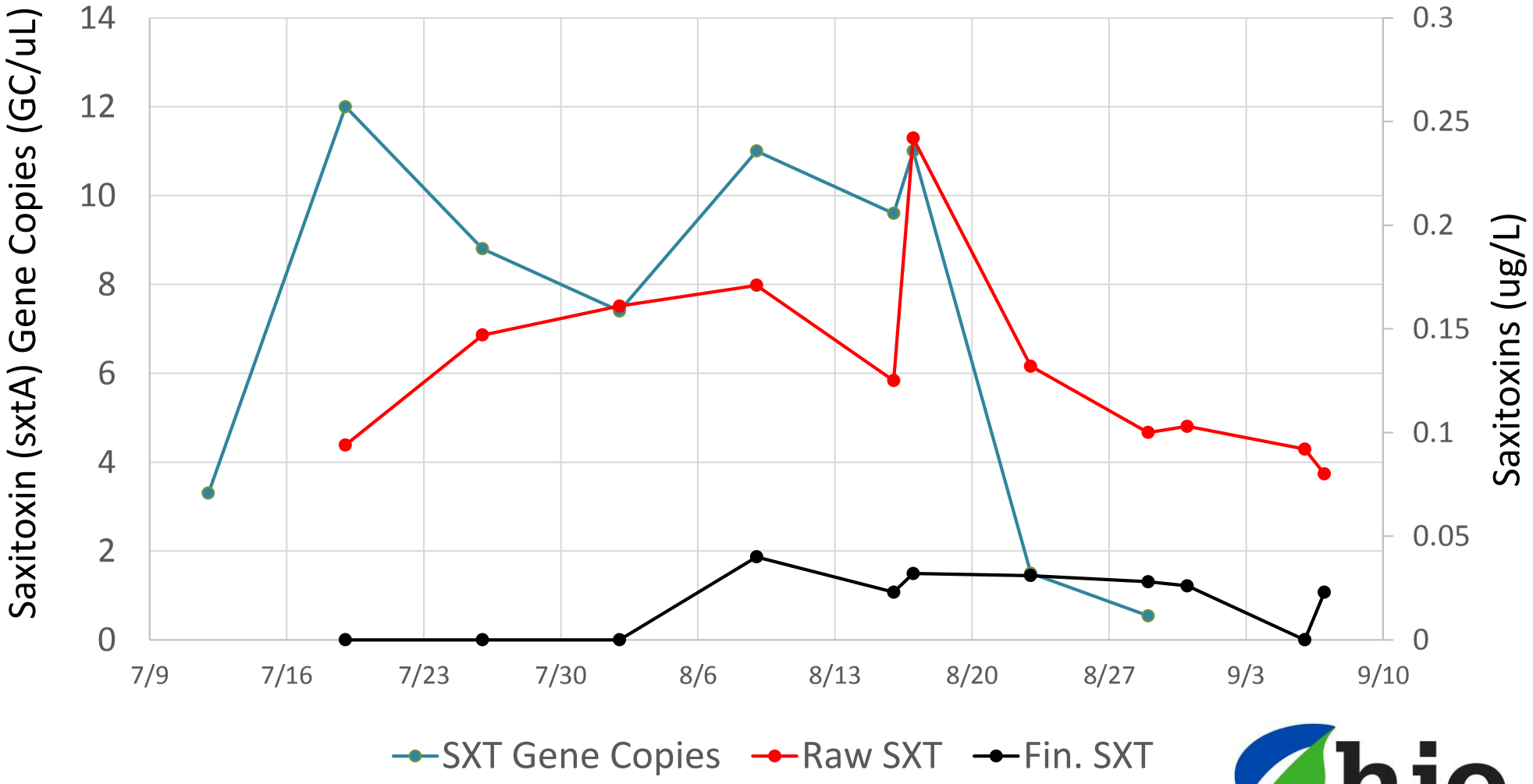
Preliminary Findings

Saxitoxin Gene and Saxitoxins Detections in Raw and Finished Drinking Water



31 water systems detected sxtA and triggered saxitoxins sampling

Saxitoxins detected at 13 water systems (raw water)

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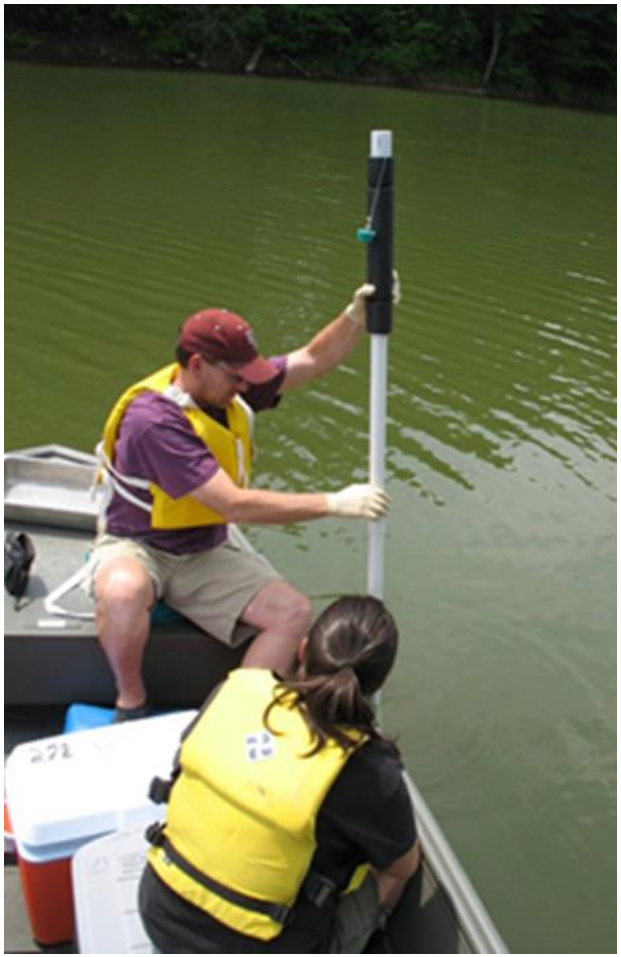
HAB Source Water Monitoring

- Visual Observation
- Phytoplankton ID and Counts
- Nutrient Monitoring (P and N)
- Other Parameters
  - pH, DO, temperature, turbidity
- Accessory Pigments
  - **Phycocyanin** & Chlorophyll-a
  - Remote sensing
  - Datasondes
- Molecular Methods (qPCR)
- Cyanotoxin Monitoring



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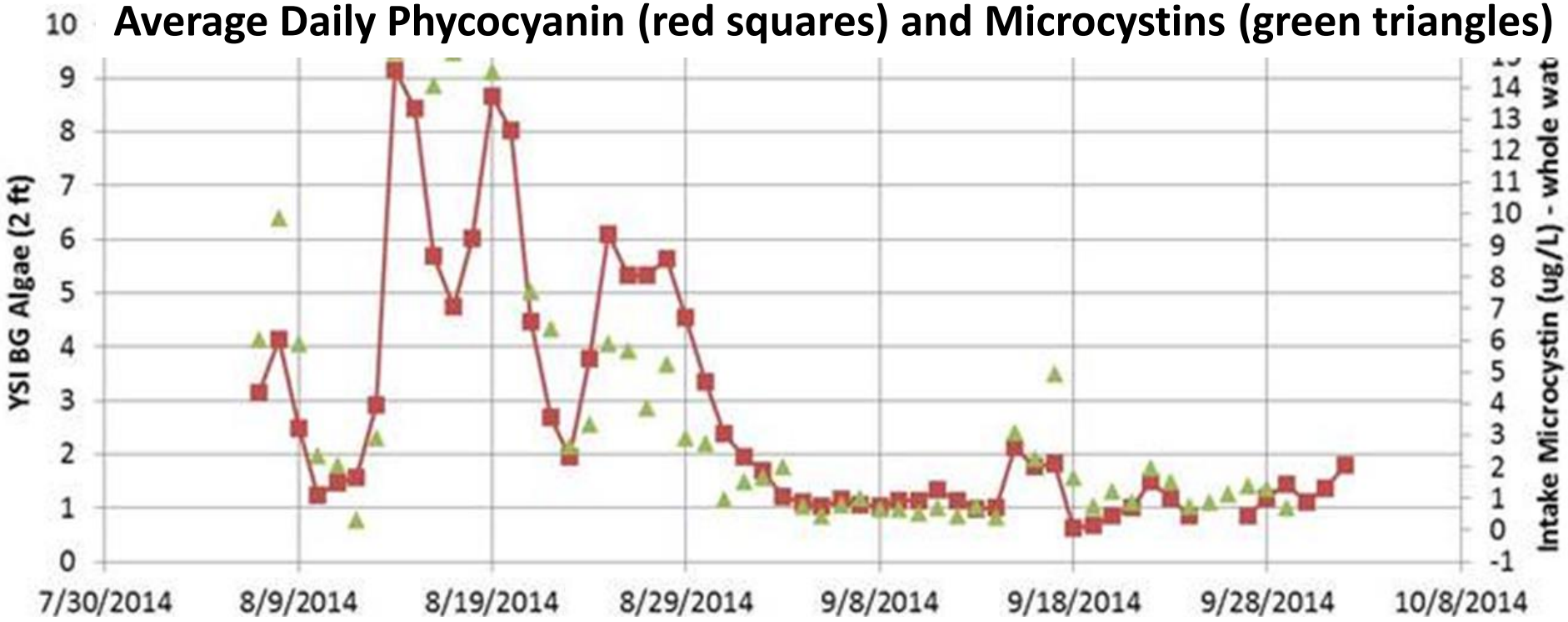
Phycocyanin/Chlorophyl-a Sensors

- Install at intake structure or wet well
  - typically as part of a multi-parameter sonde
  - Can integrate into SCADA system
- Lab or hand held units



(Graph provided by Limnotech)

HAB Monitoring and Equipment Grants

Over $1.2 million in grants awarded; up to $30,000/water system

- 33 ELISA Microcystins Testing Equipment and Training
- 32 Microscopes
- 16 Additional Training (phytoplankton identification, etc.)
- 37 Multi-parameter Datasondes

Funding is still available!1

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Reservoir Management

- Effective tool (short and long term options)
- In-tandem with watershed/source water management
- Baseline data critical
- Local control

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Example: Reservoir Management

	Intake (west)		Pump (east)		
	Surface (0-2m)	**Depth** (~3m)	**Surface** (0-2m)	**Depth** (~3m)	**Cattail**
Saxitoxins (µg/L)	0.226	0.068	0.207	0.068	
Saxitoxins_EC* (µg/L)	.084	0.094	.081	0.068	
Saxitoxin_GC** (gene copies/µL)		9.4	8.1	9.1	Non Detect
Total Cyanobacteria** (gene copies/µL)		1500	1400	1400	46

Example: Treatment Train Analysis

Raw Water

Date	Saxitoxins (Extra Cellular) ug/L
8/29/16	0.486 (0.431)
8/30/16	0.550 (no data)
9/6/16	**0.190 (0.075)**
9/7/16	0.249 (0.220)
9/12/16	**0.150 (0.142)**

Sed. Basin 2

Date	Saxitoxins (ug/L)	% Removal
9/6/16	0.055	71%
9/12/16	0.064	59%

Most removal in Sed. Basins

Sed. Basin 1

Date	Saxitoxins (ug/L)	% Removal
9/6/16	0.078	59%
9/12/16	0.084	46%

Filter 2

Date	Saxitoxins (ug/L)	% Removal
9/6/16	0.050	3%
9/12/16	0.057	5%

Filter 1

Date	Saxitoxins (ug/L)	% Removal
9/6/16	0.061	9%
9/12/16	0.072	8%

Finished Water

Date	Saxitoxins (ug/L)	% Removal
8/29/16	0.040	92%
8/30/16	0.058	89%
9/6/16	**0.050**	**74%**
9/7/16	0.055	78%
9/12/16	**0.054**	**65%**

System 2
Cumulative removal
74%, 63%

Average removal in clear well
3%, 7%

System 1
Cumulative removal
68%, 54%

Addressing the Source of HABs

- Clean Water Act
  - Public Drinking Water Supply Beneficial Use
- Inland Lakes Monitoring
  - Prioritization of PWS lakes, additional parameters
- SWAP Program
  - Public interest and concern
  - PWS cost and concerns should be a priority in nutrient reduction discussion

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Joint OEPA/USEPA Comprehensive Performance Evaluation (CPE) Effort

- Project to expand the national CPE program to optimization of cyanobacteria and cyanotoxins
  - Developmental effort to establish a CPE protocol incorporating HABs
  - Evaluate HAB related performance factors to assess the WTP's ability to address cyanobacteria and cyanotoxins
  - A total of four Ohio surface water PWS will be involved in the project

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Joint OEPA/USEPA Comprehensive Performance Evaluation (CPE) Effort

- Initial Observations
  - The integrity of the data is important.
  - Jar testing and full scale operational data are far more useful tools in optimizing treatment than models, calculators or research based isotherms.
  - Administrative support and dedicated operators is essential to success.

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Reduced Monitoring

- **Reduced Monitoring for Total Microcystins**
  - Pursuant to OAC Rule 3745-90-03, your PWS may qualify for reduced monitoring if total microcystins are non-detect (ND) in raw and finished water compliance samples collected during the last two weeks of routine monitoring in October.
  - Reduced schedule
    - 1 raw water total microcystin sample every other week
    - Must be paired with cyanobacteria screening sample
  - Ohio EPA 10/14/16 letter
    - Outlined PWS requirements/responsibilities for reduced monitoring
    - This is the only notification you will receive concerning reduced monitoring

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Reduced Monitoring

- Reduced Monitoring is conditional
  - If any PWS on reduced monitoring has a raw water total microcystins detection:

    1. Collect raw and finished samples within 24 hours of the raw detection.

    2. Return to weekly sampling at raw and finished water sampling points.

- 2017 monitoring schedules will be mailed in December and reflect the revised monitoring schedule if eligible.

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Next Steps

- **Funding Assistance**
  - WSRLA HAB Infrastructure Loans (0% Interest/20 yrs)
  - Monitoring Equipment Grants – $500,000 addition in 2016
    - up to $30K per PWS, lifetime max).
- **Ongoing Research**
  - Ohio Board of Higher Education HAB Grants
  - Collaboration with USEPA and AWWA on Methods
  - Collaboration with NOAA and USGS on HAB Surveillance
  - USEPA/OEPA HAB focused treatment assessments (CPE)
- **Post-Season full evaluation of 2016 and updates for 2017**

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Questions

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Microcystins Action Levels

- Based on U.S. EPA's health advisory levels
  - Based on oral ingestion of drinking water at these levels for up to **ten days**
  - *Includes nursing and pregnant women, individuals with liver disease and those on dialysis

Action Level	Total Microcystins (µg/L)
Children under 6 and sensitive populations*	0.3
Children 6 and older and adults	1.6

- Exceedance in a finished water sample will trigger:
  - Additional monitoring
  - Treatment optimization
  - Potentially other actions (e.g. public notification)

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