Summary of Ohio’s new HAB Rules and Drinking Water Response Strategy

June 7, 2016
Presentation Outline

• Brief Program History
• 2016 HAB Rules
• HAB Strategies
  – Drinking Water
  – Recreational Waters
• Next Steps
The Beginning - 2010

Ohio EPA began sampling for cyanotoxins

Grand Lake Saint Marys, 27 square mile recreation and drinking water lake, experiences lake-wide bloom
2011 - First HAB Strategy

- sampling procedures and frequency,
- cyanotoxin thresholds,
- public notice templates, and
- HAB-related contingency planning recommendations
- reviewed and revised annually
2011 - Lake Erie Experiences Worst HAB on Record
Lake Erie algae bloom expected to be smaller by summer's end

Researchers seeking long-term answers

BY SOPHIE BROACH
BLADE STAFF WRITER

GIBRALTAR ISLAND, Ohio -- Last summer, harmful algae covered a Long Island-sized area of water in Lake Erie, ramping up the cost of water treatment, sickening pets, and driving tourists away from beaches.

But state and federal officials Thursday predicted good news. This year, the algae bloom will likely be only about one-tenth the size of the bloom that spread across Lake Erie's western basin in 2011.

“The key question was: what will happen next?” said Jeff Reutter, director of Ohio State University's Sea Grant program, at a news conference held Thursday at the Ohio State University Stone Laboratory on
2013 - Carroll Township

FINISHED WATER Microcystin concentrations:
1.43 ug/L
3.56 ug/L (repeat sample)

Do Not Drink Advisory Issued - 2288 People Affected
August 2014 - Harmful Algal Bloom Quickly Surrounds Toledo Intake Crib
2014 - City of Toledo
“Do Not Drink” Advisory

Toxic Algae Bloom Leaves 500,000 Without Drinking Water in Ohio

Codi Yeager-Kozacek, Circle of Blue | August 3, 2014 2:15 pm | Comments

BREAKING: Toledoans asked not to drink or boil water

Poised Aug 02, 2014 2:06 AM EDT
Updated: Aug 02, 2014 2:09 AM EDT
Posted by WTOL Staff - email

TOLEDO, OH (Toledo News Now) – The city of Toledo has sent out a urgent notice to residents of Toledo and Lucas County who receive water from the city of Toledo.

You are being asked to avoid drinking or boiling water.

Chemists testing water at Toledo’s Collins Park Water Treatment Plant had two sample readings for microcystin.

You should not drink the water until an “all clear” is issued.

Here’s additional information from the city:

What should you do?

DO NOT DRINK THE WATER. Alternative water should be used for drinking, making infant formula, making ice, brushing teeth and preparing food. Pets should not drink the water.
2015 PWS HAB Strategy

- Incorporate US EPA’s Health Advisory Levels
- Drinking water thresholds
- Monitoring strategy
- Response to finished water exceedances
  - Public notification
  - Drinking water advisories
- Contingency Planning
2015 – Lake Erie Experiences Second Largest Bloom on Record
Occurrence – The Ohio River

Cincinnati Intake

Maysville, KY

Ironton
HABs Reported Across the State (2010 – 2015)

Public Water Systems with Cyanotoxin Detections in Source Water (54 Total)

Sampled 72 SW PWSs (59%)
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
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
Applicability

• Surface water systems
  – All requirements apply

• Consecutive (purchased) surface water systems from out-of-state sources
  – Finished water microcystins monitoring only

• In-State consecutive (purchased) surface water systems
  – Routine monitoring and treatment technique requirements do not apply; distribution monitoring if wholesale system has Action Level exceedance
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*

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

<table>
<thead>
<tr>
<th>Action Level</th>
<th>Total Microcystins (μg/L)</th>
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<tbody>
<tr>
<td>Children under 6 and sensitive populations*</td>
<td>0.3</td>
</tr>
<tr>
<td>Children 6 and older and adults</td>
<td>1.6</td>
</tr>
</tbody>
</table>

*Ohio Environmental Protection Agency*
Monitoring Requirements
Microcysts

Routine monitoring for total microcysts

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: 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 to respond based on results
  - Ohio EPA conducting all analysis
  - Must be filtered within 48 hrs and analysed within 7 days of collection
Response to Microcystin Detections

- **Raw water > 5 ug/L** = increase monitoring to 3 days/week
- **Finished water detect** = increase to daily monitoring
  - OEPA initiate immediate response with PWS
- **Finished water detect exceeds Action Level** = **Resample** and **Repeat** Sample
  - **Resample.** Collect raw/finished resample asap but no later than 24 hours after notified of exceedance. Analysis w/in 24 hours of collection.
  - **Repeat.** Collect raw/finished repeat samples within 24 hours of collecting the resample. Analysis w/in 24 hrs of collection.
Resample and Repeat Samples

- If finished water Resample or Repeat samples exceed the action level:
  - PWS notifies consecutive systems
    - within 3 hrs. of receiving results that exceed Action Level
  - PWS and consecutive systems collect distribution samples
    - within 24 hrs. of receiving results that exceed Action Level
- If finished water Repeat sample exceeds the action level:
  - PWS conduct public notification

Quick treatment optimization and source management are critical and can prevent advisories.
Treatment Technique Requirements

• Treatment Optimization Protocol (short term)
  – Microcystins detected in raw or finished water
  – Optimize existing treatment

• 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
Tier 1 Public Notification

• Tier 1 PN issued
  – Repeat finished water sample exceeds an action level
  – Failure to collect repeat samples

• May limit distribution of public notice
  – Demonstrate cyanotoxins remain below the action level in portions of the distribution system
  – Ongoing daily distribution monitoring
  – Procedures for making this demonstration identified in Contingency Plan
Public Notice Language

DRINKING WATER WARNING

Microcystins are present in [name] water system

Microcystins, compounds produced by blue-green algae, have been detected in the finished drinking water from [name] water system. A sample collected on [date] shows microcystins at [level] micrograms/liter (μg/L). U.S. EPA has established a national health advisory level for bottle-fed infants and children younger than school age based on drinking water for 10 days. The Ohio Environmental Protection Agency recommends that bottle-fed infants and children younger than school age do not drink the water at microcystins levels above 0.3 μg/L.

What should I do?

* THE FOLLOWING INDIVIDUALS SHOULD NOT DRINK THE WATER: Bottle-fed infants and children younger than school age, pregnant women, nursing mothers, those with pre-existing liver conditions and those receiving dialysis treatment. These individuals may be more susceptible than the general population to the health effects of microcystins. Alternative water should be used for drinking, making infant formula, making ice, brushing teeth, and preparing food.

[Additional Guidance for specific populations... included]
Tiers 2 & 3 PN, CCR and Recordkeeping

• Tier 2 PN
  – Failure to submit treatment optimization protocols
  – Failure to submit or implement cyanotoxin general plan

• Tier 3 PN
  – Failure to monitor or report

• CCR
  – Include any finished water action level exceedance (including distribution sites)

• Recordkeeping
  – Keep records for 10 years
Certified Laboratory Requirements

• Microcystins and cyanobacteria screening are being incorporated into the existing laboratory certification program.

• Laboratory certification fee ($1,550) will be deferred until June 1, 2017.

• Microcystins
  – Analytical method “Ohio EPA Total (Extracellular and Intracellular) Microcystins - ADDA by ELISA Analytical Methodology” version 2.2 (August 2015)
  – Samples must be analyzed within 5 days of collection, except in limited circumstances which require analysis within 24 hours.

Current List of approved microcystin labs
Reporting Deadlines

• Report by the end of the next business day to OEPA and PWS
  – all detections of microcystins in finished water samples
  – all results above 5 µg/L microcystins in raw water samples
  – all daily, resamples and repeat samples
  – all results of cyanobacteria screening that indicate the potential for cylindrospermopsin, saxitoxins

• All others, report by the 10th day following the month in which the sample was collected.
2016 PWS HAB Strategy

• Incorporate new HAB rules
• Drinking water thresholds
• Monitoring strategy
  – OEPA response to qPCR screening
• Response to finished water exceedances
OEPA/ODH Coordination during Drinking Water HAB Event

• Initial result above action level
  – Ohio EMA Watch Desk and others notified (ODH)

• Resample above action level
  – Ohio EMA notifies broader list (incl. local officials)

• Repeat exceeds action level
  – Ohio EMA activated Emergency Operations Center (EOC)
  – Public Notification Issued
2016 Ohio HAB Strategy for Recreational Waters

- Multi-agency effort
  - Ohio EPA, ODNR, ODH
  - Public waters focus
  - Numeric thresholds
  - Advisory language and signage
  - Sampling guidance

ODH recorded video presentation
http://progressive.powerstream.net/008/00153/HAB2016/HAB2016.html
Where are Advisories Posted?

Drinking Water
http://www.epa.state.oh.us/ddagw/pws/advisory_map.aspx
www.Ohioalgaefinder.com

Recreational (Beachguard)
http://www.odh.ohio.gov/healthybeaches
Key Agency Roles (Recreational HABs)

- **ODNR**
  - Monitor and post advisories at State beaches and boat ramps
- **ODH**
  - Coordinate with LHDs when responding to HABs (LHD sample and post advisories)
  - Maintain BeachGuard web site
  - Evaluate/classify illness reports, support local investigations
- **OEPA**
  - Collect, review and forward Algal Bloom Reports
  - Maintain database of state-reported HAB data and [ohioalgaeinfo.com](http://ohioalgaeinfo.com)
  - Monitor satellite imagery
  - Monitor PWS, Inland Lakes, Lake Erie, and other waters
  - Provide sampling guidance and training
Outreach

• Public water systems: 4 outreach sessions
• Local Government Officials: 6 regional meetings planned
Next Steps

• Funding Assistance
  – **WSRLA HAB Infrastructure Loans** (0% Interest/20 yrs) - $50M was allocated this year (3rd year) and approximately $20M unallocated.
  – **Monitoring Equipment Grants** – Ohio EPA anticipates additional funds will become available after July 1, 2016; recommend that entities apply now to get on the waiting list (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

• Post-Season full evaluation of 2016
Questions?

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