2017/18 Review of Freshwater HAB Programs

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2017/2018 Review – To Date

- Updated the summary table for all 50 states through:
  - A lot of internet searches
  - Some direct communication to fill in the gaps

- Provided updated state program websites to North American Lake Management Society (NALMS) and USEPA

- Provided brief presentation at January CCHAB Network meeting
  - Grouped freshwater HAB programs into 3 relative categories (less, more, and most developed)
  - Identified some common issues or next steps across states
  - Provided initial thoughts about further outreach
2017/2018 Review – This Talk

• More detailed summary of:
  • Regulations and funding
  • Planning documents
  • Reporting
  • Recreational water
  • Drinking water
  • Outreach and mapping

• Please Note:
  • Specific states are provided (with hyperlinks) as examples of different characteristics. These lists may not be comprehensive.
  • Websites are subject to change, so please check original sources for current resources.
REGULATIONS & FUNDING
HAB-related Statutes and Regulations

- **OK: Title 74, Section 2301** (2012)
  - Identify agency lead for public information for recreational waters in OK
  - State Department of Health to provide information on public health impacts
  - Require waterbody managers to post advisories with exceedance of established action levels (100,000 cells/mL and 20 µg/L microcystin)

- **WA:** [Aquatic algae control account](http://www.dnr.wa.gov) (RCW 43.21A.667, 2011)
  - $1 from [derelict vessel and invasive species removal fee](http://www.dnr.wa.gov) ($5 total)
  - Develop freshwater and saltwater aquatic algae control program
  - Fund grant program for managing freshwater and saltwater nuisance algae
  - Provide technical assistance

- **OR:** Title 36, [Oregon Revised Statute (ORS), Chapter 431.035 to 431.530](http://www.oregonlegislature.gov) (2013)
  - OPHD has authority to issue and lift advisories for HABs

- **FL:** Title XXVIII, Chapter 379, Sections 2271 and 2272 (2017)
  - Establish HAB task force and HAB program for red tides and other HABs in Florida waters (estuarine and marine) under Fish and Wildlife Research Institute
HAB Program Funding

• Federal funding
  • Initial funding from CDC
    • OR (ended 2013)

• Vessel registration fee
  • WA
    • Annual grant program ($100-200K per year; maximum grant $50K)
    • Project types include monitoring plans, pilot projects, research, and sampling equipment (and others)

• State agency funds
  • Limited funds for initial response, follow up by local agencies (CA, RI)
PLANNING DOCUMENTS
Planning Documents

- Terminology
  - Response plans, strategies, toolkit, guidance

- Content
  - Background on cyanobacteria, identification, health impacts
  - Roles and responsibilities, contacts
  - Reporting process
  - Response flow chart, timelines, and action levels
  - Monitoring methods
  - Drinking water intake locations
  - Templates of signage, press releases, and other outreach materials

- Audience
  - Local health departments, local municipalities/communities, state agencies, public

- Scope
  - State
    - CA, OR, MI*, NJ, NY, OH, OR, VA, WI, WV, WY*
  - Multi-state waterbody
    - Upper Mississippi River, Lake Erie

* received upon request
Planning Documents – State Examples

**HARMFUL ALGAL BLOOMS (HABS) PROGRAM GUIDE**

**PUBLIC HEALTH ADVISORY GUIDELINES**

**Cyanobacteria** (Blue-Green Algae) Guidance for Vermont Communities

**Key Messages**

- Informal messages
- Three pieces of supporting information (for each key message)
  - Map
  - Reference to cyanobacteria, information known as blue green algae, and cyanobacterial toxins that are responsible for harmful algal blooms.
  - Image of a blue-green algae bloom.

**Supporting Information**

- Map of Vermont highlighting areas with cyanobacteria blooms.
- Reference to cyanobacterial toxins and their effects.
- Image of cyanobacteria blooms in various stages.

**Appendix B. BATS Health Alert Template**

**Planning Document**

- Identification of cyanobacteria blooms
- Guidance for public health advisories
- Information on cyanobacterial toxins and their effects
- Links to additional resources and information.
Planning Documents – Multi-state Waterbody Example

Upper Mississippi River (UMR) Harmful Algal Bloom (HAB) Work Group

Upper Mississippi River Harmful Algal Bloom Response Resource Manual

3 - Spatial Scope, UMR-Specific Presence, and Staffing/Field Presence

4 - Parameters, Sampling Frequency, Sampling and Analytical Methods, Laboratories Used

**Illinois EPA**
- **Parameter Focus:** Cyanotoxins, microcystin and limited cylindrospermopsin.
- **Sampling Frequency:** Routine lake surveys twice per year in early April and September.
- **Sampling Methods:** Use ELISA field test kits and, if necessary, lab tests.
- **Analytical Methods:** Use a combination of nine samples and a control for each.

**Iowa DNR**
- **Parameter Focus:** Microcystin, microcystin-LR, and cylindrospermopsin.
- **Sampling Frequency:** Weekly during the growing season.
- **Sampling Methods:** Use ELISA kits and lab tests for select samples.
- **Analytical Methods:** Use ELISA and HPLC-MS/MS.

**Minnesota DFLA**
- **Parameter Focus:** Microcystin, cylindrospermopsin, saxitoxin, and anatoxin-a.
- **Sampling Frequency:** Monthly and quarterly samples.
- **Sampling Methods:** Use ELISA and HPLC-MS/MS.
- **Analytical Methods:** Use ELISA and HPLC-MS/MS.

**Missouri DNR**
- **Parameter Focus:** Microcystin, cylindrospermopsin, saxitoxin, and anatoxin-a.
- **Sampling Frequency:** Weekly and monthly.
- **Sampling Methods:** Use ELISA and HPLC-MS/MS.
- **Analytical Methods:** Use ELISA and HPLC-MS/MS.

**Wisconsin DNR**
- **Parameter Focus:** Microcystin, cylindrospermopsin, saxitoxin, and anatoxin-a.
- **Sampling Frequency:** Monthly and quarterly.
- **Sampling Methods:** Use ELISA and HPLC-MS/MS.
- **Analytical Methods:** Use ELISA and HPLC-MS/MS.

*Federal Agencies*

**Upper Mississippi River Basin Association**

_UMR-HAB Tools and Resources (August 2017)_
REPORTING
Reporting Algal Blooms

- Bloom reporting
  - HAB-specific – most states
  - Generic environmental incidents/spills - AZ, NJ, NM, TN, TX, UT, WY

- Phone/email
  - 24-hour hotline (particularly if fish kills or human illness) - MD, MT, TX, UT, VA
  - Single HAB phone # or email
  - Individual staff contact
  - Multiple contacts (health and environmental agencies)
Reporting Algal Blooms - Forms

- Submittal – online, email, or fax
- Typical content
  - Notifying party contact and/or anonymous option
  - Bloom description – extent, color, timing, location
  - Photos
- Additional content
  - Waterbody use (recreational/drinking water)
  - Waterbody management
  - Sampling
  - Weather conditions
  - Animal and/or human illness
  - Advisory signage posted
- Pros: more detailed info, can auto-populate database with online submittal
- Cons: may be more difficult to submit in the field or on mobile device
Reporting Algal Blooms – Smart Phone Apps

• State-specific app for reporting incidents
  • AR, NJ

• General app for reporting HABs
  • BloomWatch
  • UGA CyanoTRACKER

• Pros: ease of photos, locations, use in the field

• Cons: may be more difficult to follow up with reporting party, generally less detailed
Reporting Human Incidents

- 1st step - seek medical attention, contact your physician

- Contact for more information:
  - Local health department – most states
  - Poison control center (1-800-222-1222) - CO, FL, NE, UT, WI, WY

- Reporting form
  - Specific for human illness - IL
  - Part of bloom reporting form - CA

- Reporting illness
  - Report to state health agency
    - Report as general “waterborne illness” – ID
    - Report as “unusual condition or emerging infectious disease” – WV
    - Report as HAB-specific illness – IA, MD, WI
    - Encourage voluntary reporting – most states
  - Report to CDC OHHABs
    - Specific link to OHHABS identified - ID, IA, OR, VA
Reporting Domestic Animal Incidents

• 1st step – contact your veterinarian

• Contact for more information:
  • Poison control center (1-800-222-1222)
  • Pet poison hotline (855-764-7661) – ID
  • State health agency staff - OR

• Reporting form
  • Specific for animal illness
    • Separate small and large animal forms - MN
  • Part of bloom reporting form – CA

• Report to
  • State public health veterinarian or state agency – IN, OR, WI, WY

• Report to CDC OHHABs
Reporting Fish or Wildlife Incidents

• Reporting form
  • Part of bloom reporting form

• Report to
  • State wildlife agency - CA
  • State public health veterinarian – WY
  • Hotline for fish and/or wildlife impacts – FL, MD
  • USGS Wildlife Health Center

• CDC OHHABs reporting
RECREATIONAL WATER
Monitoring – Timing

- “Reactive monitoring” in response to bloom/illness reports – most states

- Incorporate into ongoing monitoring
  - Ambient water quality monitoring
  - Routine beach/lake fecal bacteria monitoring – IA, NE

- One-time, special study
  - USGS
  - Academic research
  - University extension
Monitoring – Participants

- Agency staff
  - Initial response (CA, RI)
  - Routine
- Native American tribes – CA (Clear Lake and Klamath Basin)
- Waterbody/land managers - OR
- Local municipalities
- Drinking water suppliers
- Researchers
- Citizen volunteer programs - MO, NY
Monitoring – Analyses

• Relates to what data are used as action levels for response/advisory
• Visual observations – bloom, Secchi depth, stick and jar test
• Cell identification and counts
• Chlorophyll-a
• Phycocyanin
• Cyanotoxins
  • Lab
  • Field tests
  • Deployed instruments (Environmental sample processor)
Recreational Water Advisories and Signage

• Long-term, general awareness signage -  **OH, VA, WV, PA (Lake Erie)**
• Under investigation signage –  **CO, WY**

• Specific advisory/signage
  • Single (non-tiered) advisory
    • 1 level based on presence/duration of bloom -  **DE, FL, NM**
    • 1 level based on action levels -  **CO, IA, ID*, IL, MA, MD, MI*, MO*, NC, NE, NH, OK, OR, RI, WI**
  • Tiered advisories based on action levels
    • 2 levels –  **CT, IN, KY*, MN, MT, ND, OH, PA, VA, VT, WV, WY**
    • 3 levels –  **CA, KS, NJ, NY, UT, WA, USACE Tulsa**

*Received upon request*
Recreational Water – Awareness / Long-term Signage

• General awareness
• Pictures and descriptions of HABs
• General precautions
• Contact info
• OH, VA, WV, PA (Lake Erie)
• Permanent
• OR (S. Umpqua R.)
Recreational Water – Under Investigation

- Avoid contact with bloom, do not drink water
- CO ("caution"), WY
Recreational Water – Single (Non-tiered) Advisory Sign

- Typically avoid water contact, particularly pets and children
- Based on presence/duration of bloom
- DE, FL
- Based on action levels
- CO, IA, ID, MA, MD, MI, MO, NC, NE, NH, RI, OK, OR, WI
Recreational Water - Tier I

- Typically avoid water contact, particularly pets and children
- Advisory: MN, ND, PA, VA, WY
- yellow/low alert: VT
- Watch: KS, KY, WV
- Caution: CA, WA
- Recreational use advisory: PA, OH
- Cautionary/Visual Category 2: CT
- Suspicious: NY
Recreational Water – Tier II

• Typically no water contact
• Warning: CA, KS, KY, MN, ND, NJ, UT, VA, WA, WV
• red/high alert: VT
• Avoid contact: PA
• Condition 2: USACE Tulsa
• Elevated Recreational use advisory: OH
• Beach closure/Visual Category 3: CT, VT
• Confirmed: NY
• Closed: WY
Recreational Water - Tier III

- Typically closure
- Danger: CA, NJ, UT, WA
- Closure: KS
- Condition 3: USACE Tulsa
- Confirmed with High Toxin: NY
<table>
<thead>
<tr>
<th>CyanHAB (cells/mL)*</th>
<th>Source</th>
<th>General signage</th>
<th>Single advisory</th>
<th>Tier I advisory</th>
<th>Tier II advisory</th>
<th>Tier III advisory</th>
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<td>4,000</td>
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<td></td>
<td>CA</td>
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<tr>
<td>10,000</td>
<td>NC, 2017</td>
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<td>NC (+BGA sp. dominant)</td>
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<td>WHO, 2003 (low)</td>
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<td>ID (MC sp.)</td>
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<td>ID, 2017; MO, 2016; OR, 2018</td>
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<td>ID (total sp.), MD, MO, OR (MC sp.)</td>
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<td>80,000</td>
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<td>KS</td>
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<td>100,000</td>
<td>WHO, 2003 (moderate)</td>
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<td>MO, OK, OR (total sp.), WI</td>
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<td>KS, 2015</td>
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<td>KS, UT</td>
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* Sorted in increasing numerical order

** with presence of bloom
<table>
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<th>MC (ug/L)*</th>
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<td>&lt;4 **</td>
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<td>4</td>
<td>USEPA, 2016; KS, 2015; OR, 2018</td>
<td>CO, ID, OR</td>
<td>CT, IN, KS, MI, NY</td>
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<td>UT</td>
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<td>&lt;6 **</td>
<td>OH, 2016</td>
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<td>6</td>
<td>OH, 2016; CCHAB, 2016</td>
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<td>CA, VA, VT, WA</td>
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<td>&lt;10 **</td>
<td>WHO, 1999</td>
<td>WI</td>
<td></td>
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<td>NY</td>
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<td>MD, MO, WI</td>
<td>MO, WY</td>
<td>ND</td>
<td>NY</td>
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<td>14</td>
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<td>IA, IL, MI, NE, WI</td>
<td>IN, KS, KY, MI, OH, OK, PA, TX, WV</td>
<td>CA, NY (shore)</td>
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* Sorted in increasing numerical order
** with presence of bloom
## Action Levels for Recreational Waters – Cylindrospermopsin

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<th>CYL (ug/L) *</th>
<th>Source</th>
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<td>CA</td>
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<td>4.5</td>
<td>WA, 2011</td>
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<td>CA</td>
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<td>&lt;5 **</td>
<td>OH, 2016</td>
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<td>CA</td>
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<tr>
<td>5</td>
<td>OH, 2016</td>
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<td>KY, OH, PA, WV</td>
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<td>VT, 2015</td>
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<td></td>
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<td>17</td>
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<tr>
<td>20</td>
<td>OH, 2016</td>
<td></td>
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* Sorted in increasing numerical order
** with presence of bloom
## Action Levels for Recreational Waters – Anatoxin-a

### Action Levels

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<tr>
<th>ANA (ug/L)*</th>
<th>Source</th>
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<th>Tier I advisory</th>
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<td>detect</td>
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<td></td>
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<tr>
<td>20</td>
<td>CCHAB, 2016</td>
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<td>MO, CA</td>
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<td>&lt;27 **</td>
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</tr>
<tr>
<td>27</td>
<td>NJ, 2017</td>
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<td>&lt;80</td>
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<td>IN, OH, PA, WV</td>
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<tr>
<td>80</td>
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<td>USEPA, 2016</td>
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<tr>
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<td>300</td>
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<td></td>
<td></td>
<td>OH, PA, WV</td>
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* Sorted in increasing numerical order
** with presence of bloom
### Action Levels for Recreational Waters – Saxitoxin

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<th>SAX (ug/L) *</th>
<th>Source</th>
<th>General signage</th>
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<th>Tier III advisory</th>
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<td>&lt;0.8 **</td>
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<td>OH, WV</td>
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<td>0.8</td>
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<td>OH, PA, WV</td>
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<tr>
<td>3</td>
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<td></td>
<td></td>
<td>OH, PA, WV</td>
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<tr>
<td>4</td>
<td>OR, 2018</td>
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<td></td>
<td>CO, OR</td>
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</tr>
<tr>
<td>10</td>
<td>MO, 2017</td>
<td></td>
<td></td>
<td>MO</td>
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<tr>
<td>75</td>
<td>WA, 2011</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>WA</td>
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</table>

* Sorted in increasing numerical order
** with presence of bloom
Human Fish/Shellfish Consumption Advisories

• General precautions
  • Fish:
    • If you fish, remove guts and rinse in clean water;
    • Do not fish until bloom disappears;
    • OR
    • Wait a couple weeks after the bloom disappears to be “extra safe”
  • Shellfish: do not consume
  • Most states include as part of general signage

• Cyanotoxin tissue levels
  • CA
  
<table>
<thead>
<tr>
<th>Chemical</th>
<th>RID(^1)</th>
<th>Action Level(^2)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Units</td>
<td>ng/g tissue ww(^4)</td>
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<tr>
<td>Microcystins(^3)</td>
<td>6.4 x 10(^{10})</td>
<td>10</td>
</tr>
<tr>
<td>Cylindrospermopsin</td>
<td>3.3 x 10(^{6})</td>
<td>70</td>
</tr>
<tr>
<td>Anatoxin-a</td>
<td>2.5 x 10(^{3})</td>
<td>5000</td>
</tr>
</tbody>
</table>

\(^1\) RIDs calculations described in section III above
\(^2\) Based on typical consumption rate of self-caught fish in California (one meal per week) and body weight of 70 kg. See Appendix II for calculations. Children are assumed to eat smaller meals (2-4 ounces uncooked).
\(^3\) Apply action levels to the sum of all detected microcystins until subchronic toxicities of other variants are clarified.
\(^4\) Wet weight. Action level units assume fresh (or wet) weight of the fish tissue.

• FDA
  • SAX, 800 ng/g (0.8 mg/kg) ww in shellfish
Dog/Livestock Advisories

• General precautions
  • Avoid contact with water, scum, and mats
  • Provide separate source of drinking water
  • Do not allow them to groom after contact and rinse with clean water
  • Wait to graze pastures if contaminated irrigation water used

• General signage includes dogs

• Specific action levels for domestic animals
  • OR (also used in PA)
  • CA (also used in IN)
  • Drinking water ingestion rate does not account for preferential drinking and eating mat/scum

• Specific signage for domestic animals
  • Lake Erie (PA)
Dog/Livestock Action Levels

<table>
<thead>
<tr>
<th>Animal</th>
<th>Type</th>
<th>MC</th>
<th>ANA</th>
<th>CYL</th>
<th>SAX</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water intake (ug/L)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dog</th>
<th>Caution level*</th>
<th>0.8</th>
<th>Any detect</th>
<th>1</th>
<th>N/A</th>
<th>CCHAB, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use advisory</td>
<td>0.2</td>
<td>0.4</td>
<td>0.4</td>
<td>0.02</td>
<td></td>
<td>OR, 2018</td>
</tr>
<tr>
<td>Swimming</td>
<td>0.8</td>
<td>Any detect</td>
<td>1.0</td>
<td>N/A</td>
<td>IN (adapted from CCHAB, 2016)</td>
<td></td>
</tr>
<tr>
<td>Guidance value</td>
<td>0.2</td>
<td>0.6</td>
<td>0.2</td>
<td>3</td>
<td></td>
<td>PA Lake Erie (adapted from OR)</td>
</tr>
</tbody>
</table>

| Cattle (dairy**) | Subchronic | 0.9 | 40  | 5   |     | OEHHA, 2012                  |
| Acute       | 50           | 40  | 60  |     |     | OEHHA, 2012                  |

| Crust and mat intake (mg/kg dw) |

| Dog        | subchronic | 0.01 | 0.3 | 0.04 |     | OEHHA, 2012                  |
| acute      | 0.5         | 0.3  | 0.5 |     |     | OEHHA, 2012                  |
| Cattle (dairy**) | subchronic | 0.1 | 3   | 0.4 |     | OEHHA, 2012                  |
| acute      | 5           | 3    | 5   |     |     | OEHHA, 2012                  |

* Recommended for use in CA to account for preferential ingestion by dogs (vs acute and sub-chronic values based on water ingestion rate only)

** Action levels for beef cattle were also developed but were higher values than for dairy cattle
DRINKING WATER
Drinking Water Monitoring – Federal Resources

• Federal requirement under Unregulated Contaminant Monitoring Rule (UCMR 4; 2016)
  • Monitoring of cyanotoxins in drinking water for 2018-2020
  • Monitoring varies depending on size of drinking water system
  • Surface water or ground water “under the direct influence of surface water” sources only

• Many other tools and resources available
  • [https://www.epa.gov/ground-water-and-drinking-water/cyanotoxins-drinking-water](https://www.epa.gov/ground-water-and-drinking-water/cyanotoxins-drinking-water)

---

<table>
<thead>
<tr>
<th>Cyanotoxin Tools For Public Water Systems</th>
<th>Additional Information about Cyanotoxins in Drinking Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recommendations for Public Water Systems to Manage Cyanotoxins in Drinking Water</td>
<td>• Cyanotoxin Drinking Water Health Advisories</td>
</tr>
<tr>
<td>• Cyanotoxin Management Plan Template and Example Plans</td>
<td>• Detection and Methods</td>
</tr>
<tr>
<td>• Water Treatment Optimization for Cyanotoxins</td>
<td>• Control and Treatment</td>
</tr>
<tr>
<td>• Drinking Water Cyanotoxin Risk Communication Toolbox (English and Spanish versions)</td>
<td>• Cyanotoxins and the Safe Drinking Water Act; Drinking Water Protection Act, Contaminant Candidate List and the Unregulated Contaminant Monitoring Rule</td>
</tr>
<tr>
<td>• Cyanobacteria and Cyanotoxin Information for Drinking Water Systems FactSheet</td>
<td>• Algal Toxin Risk Assessment and Management Strategic Plan for Drinking Water</td>
</tr>
<tr>
<td>• Harmful Algal Blooms and Drinking Water FactSheet</td>
<td>• U.S. EPA’s CyanobHABs Webpage</td>
</tr>
<tr>
<td>• Fact Sheet: Possible Funding Sources for Managing Cynobacterial Harmful Algal Blooms and Cyanotoxin in Drinking Water</td>
<td></td>
</tr>
</tbody>
</table>
Drinking Water Monitoring – State Resources

- State programs often provide support, resources, technical expertise to drinking water systems. Examples include:
  - CA – collaborate with water systems on management plan, response, and messaging
  - IA – 2016-2017 study of microcystins in weekly raw water samples, flow charts for monitoring and public notice templates for MC and CYL
  - VT - no cost MC and CYL analysis at state lab for 22 systems using Lake Champlain water in summer 2017; weekly results posted online
Cyanotoxin Levels for Drinking Water - International

- WHO
  - MC - provisional guideline value of 1 ug/L total MC-LR

- 2015 updated summary of international drinking water guidelines (Soltani, Hess et al. 2017)
  - Most incorporate WHO value for MC
  - Australia (1.3 ug/L), Canada (1.5 ug/L) slightly higher for MC
  - Brazil and New Zealand include guideline values for other cyanotoxins
Cyanotoxin Levels for Drinking Water – United States

- **USEPA**
  - 2015 Drinking water Health Advisory for MC and CYL
- **ANA**
  - No drinking water HA determined
  - *2015 Health Effects Support Document*

- **States**
  - Most reference USEPA and/or WHO
    - Some recommend use of USEPA values for vulnerable populations only (e.g., UT, VA)
  - OH, OR, MN, VT have state-specific values
  - Some reference other state’s values (e.g., MI, UT, WV)
## Drinking Water Guidelines – United States

<table>
<thead>
<tr>
<th>Group</th>
<th>Source*</th>
<th>MC (ug/L)</th>
<th>ANA (ug/L)</th>
<th>CYL (ug/L)</th>
<th>SAX (ug/L)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable population (infants and kids under 6 years old)</td>
<td>MN</td>
<td>0.1 (HBV)</td>
<td>0.1 (RAA)</td>
<td>-</td>
<td>-</td>
<td>HBV, health based value; RAA, risk assessment advice</td>
</tr>
<tr>
<td></td>
<td>OH</td>
<td>0.3</td>
<td>20</td>
<td>0.7</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>0.3</td>
<td>0.7</td>
<td>0.7</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>USEPA</td>
<td>0.3</td>
<td>-</td>
<td>0.7</td>
<td>-</td>
<td>Heath advisory levels</td>
</tr>
<tr>
<td>Non-vulnerable (adults and kids at least 6 years old)</td>
<td>OH</td>
<td>1.6</td>
<td>20</td>
<td>3</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>1.6</td>
<td>3</td>
<td>3</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VT</td>
<td>0.16</td>
<td>0.5</td>
<td>0.5</td>
<td>-</td>
<td>Heath advisory levels</td>
</tr>
<tr>
<td></td>
<td>USEPA</td>
<td>1.6</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>Heath advisory levels</td>
</tr>
<tr>
<td></td>
<td>WHO</td>
<td>1.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Provisional guideline value</td>
</tr>
<tr>
<td>Do not Use</td>
<td>OH</td>
<td>20</td>
<td>300</td>
<td>20</td>
<td>3</td>
<td>Elevated recreational public health advisory thresholds</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

* In alphabetical order by group
USEPA Drinking Water Advisories

- Vulnerable: exceed Health Advisory for infant and <6 year old
  - Vulnerable populations should not drink the tap water and should use alternative sources of water
  - Do not boil the tap water
  - Prevent accidental ingestion of water during bathing for infants and young children
  - Individuals not in vulnerable category may drink water
  - Everyone can use tap water for washing hands, bodies, dishes, toilet, cleaning, and laundry

- Everyone: exceed Health Advisory for adult and 6+ year old
  - Do not drink or boil the tap water
  - Use alternative sources of water for drinking, infant formula, ice, preparing food and beverages
  - Provide alternative source of water for animals
  - Prevent accidental ingestion of water during bathing for infants and young children
  - Everyone can use tap water for washing hands, bodies, dishes, toilet, cleaning, and laundry

USEPA’s Risk communication toolbox
(also in Spanish)

Toolbox Contents

Templates
- Drinking Water Advisory - Everyone
- Drinking Water Advisory - Vulnerable Populations
- Drinking Water Advisory - Lifted
- Press Release - Everyone
- Press Release - Vulnerable Populations
- Press Release - Advisory Lifted
- Social Media - Everyone
- Social Media - Vulnerable Populations
- Social Media - Lifted
- Public Messaging

General Information
- Fact Sheets
- FAQs

Graphics
- Iron-Based Style
- Thermometer and Stoplight Style
- Speedometer Style
OUTREACH AND MAPPING
Outreach Materials – Human Health

• FAQs
  • Available from most states
  • Generally include overview, general precautions, next steps in case of exposure

• Physician reference
  • CDC – possible signs and symptoms
  • KS – also includes overview on monitoring, advisories, and reporting info
Outreach Materials – Domestic Animals

- Pet safety
  - CDC
  - ID, KS, MA, MN, NY

- Vet fact sheet
  - Generally include signs and symptoms, differential diagnosis, laboratory findings
  - CDC
  - CA – also includes potential sample analytical process and support
  - MN
  - VT – also includes link to current conditions map and overall occurrence in VT
  - WI – part of overall toolkit

- Cyanobacteria poisoning and livestock
  - Western Australia
  - ND
Multilingual Materials

- Spanish
  - Signage: CA, UT, VA, WY
- FAQ: VA, MA
- Safe recreational water use: VA, MA
- Pet safety: MA, OR

- Multiple
  - HABs in freshwater (MA; 7 other languages)
Mapping

- Incorporated with existing monitoring
  - Beach fecal bacteria monitoring (often seasonal)
  - Ambient water quality monitoring (rivers and/or lakes)

- Posted advisories
  - Recreational water
  - Drinking water

- Toxin data

- Bloom presence/absence
Mapping Examples - California

Klamath Basin

Statewide
Mapping Examples - Florida
Mapping Examples - Idaho
Mapping Examples - Kentucky

Kentucky Division of Water Harmful Algal Bloom (HAB) Viewer

HAB Information

Recreational Public Health Watch
Algal toxins present at levels that may affect sensitive populations. Swimming and wading are not recommended for children, pregnant or nursing women, those with certain medical conditions, and pets.

Recreational Public Health Warning
Algal toxins present at unsafe levels. Swimming, wading, and water activities that create spray are not recommended.

More Information
Click on the Red or Orange symbols for more information on the waterbody and HAB status. To learn more about HABs in Kentucky visit the Division of Water HABs Information page. If you have any questions or would like to report a bloom, contact www.ky.gov or call 502.564.3410.
Mapping Example – **Maryland (Beaches)**
Mapping Examples
– Ohio (monitoring and drinking water advisories)
Summary (1)

- Underlying regulations and funding support well-developed programs
- Response plans help coordinate efforts and provide clear and consistent process
- Reporting processes vary considerably
- Monitoring
  - Many states have reactive monitoring in response to blooms
  - Routine monitoring often tied to existing ambient water quality monitoring or fecal bacterial monitoring for recreation, and may utilize volunteers
  - Current cyanotoxin monitoring of drinking water sources under EPA UCMR4
Summary (2)

• Recreational water advisories and action levels vary considerably
  • Different action levels or same action levels applied differently
  • Different terminology and signage, but generally similar recommendations/precautions

• Outreach materials
  • Many states provide general overview of HABs and health risks, links to CDC materials
  • Some states have materials available in Spanish, few states provide resources in multiple languages

• Mapping resources convey monitoring data and/or advisories for specific locations
Questions or Suggestions on Further Outreach?

• Future plans
  • Relay information through CCHAB subcommittees
  • Specific information upon request
    • 916-322-2088
    • Rebecca.Stanton@oehha.ca.gov

• Other opportunities?