

# Recreational Risk Management of Surface Waterbodies: Cyanobacteria Surveillance in Massachusetts



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# Outline

1. Harmful Algae Blooms
2. MDPH Guidelines
3. Environmental Monitoring Program
4. Lessons Learned
5. Future Efforts





# Harmful Algae Blooms

- Blue-green algae/cyanobacteria occur in aquatic ecosystems
- Highly concentrated in water: harmful algae bloom (HAB)
- Ability to produce toxins
- Human and animal health concerns





# MDPH Guidelines



- Established cyanobacteria guidelines in 2008
- MDPH recommends an advisory when:
  - A cyanobacteria scum is present
  - A cell count exceeds 70,000 cells per milliliter of water
  - A microcystin level exceeds 14 parts per billion
- Advisories remain in place until levels remain below guidelines



# MDPH Guidelines





# Environmental Monitoring



- MDPH established an environmental monitoring program for recreational waterbodies:
  - Monitoring strategy
  - Sampling and analysis protocol
  - Data evaluation
  - Recommendations





# Monitoring Strategy



- Two types of HAB monitoring:
  - Routine
  - Response
- Once detected, samples collected weekly until advisory rescinded





# Sampling and Analysis



- Sample collection:
  - Chose location based on likelihood of exposure
  - Fill 1L amber bottle at a location 6 inches below the water surface, in 3 feet of water
- Water quality parameters collected in the field included:

■ Air and water temp.	■ Salinity
■ Secchi disk depth	■ pH
■ Dissolved oxygen	■ Turbidity





# Sampling and Analysis

- Photographs are taken to record surface water observations
- Samples are shipped to a private laboratory for analyses:
  - Genera identification
  - Genera cell count
  - Microcystin level





# Results



- From 2009-2014, 1,075 samples were collected from 75 waterbodies in 58 municipalities
- One-third of samples exceeded the cell count guideline
- The dominant genera in the exceeding samples were primarily *Anabaena*, *Aphanizomenon*, and *Microcystis*
- Less than 1% exceeded the microcystin guideline



***Anabaena* Blooms**



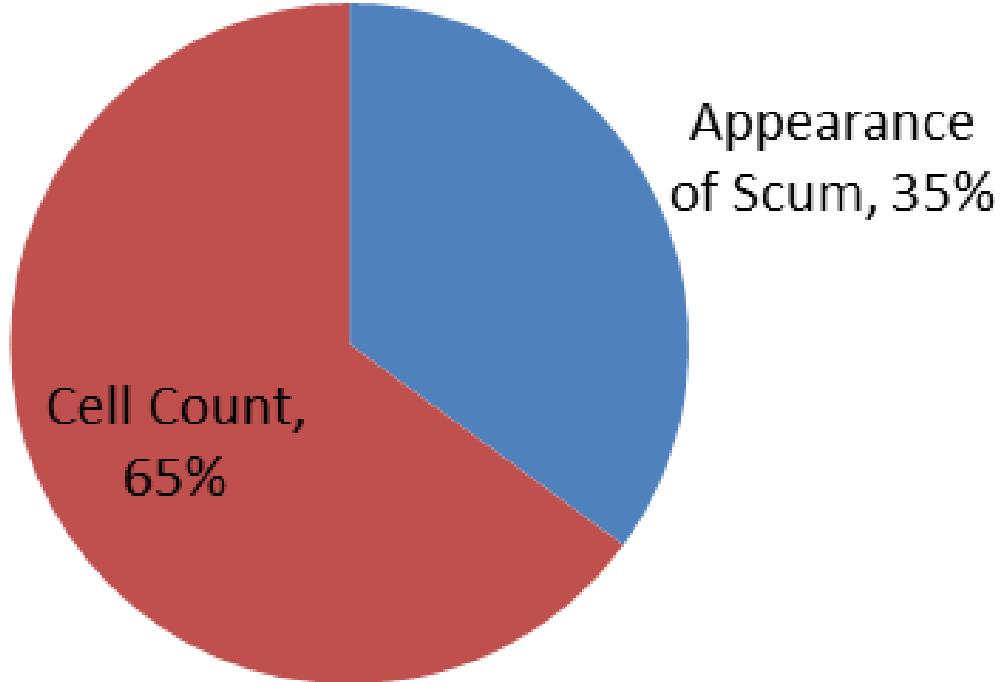
***Microcystis* Blooms**





# Advisories

- MDPH recommended a total of 97 public health advisories

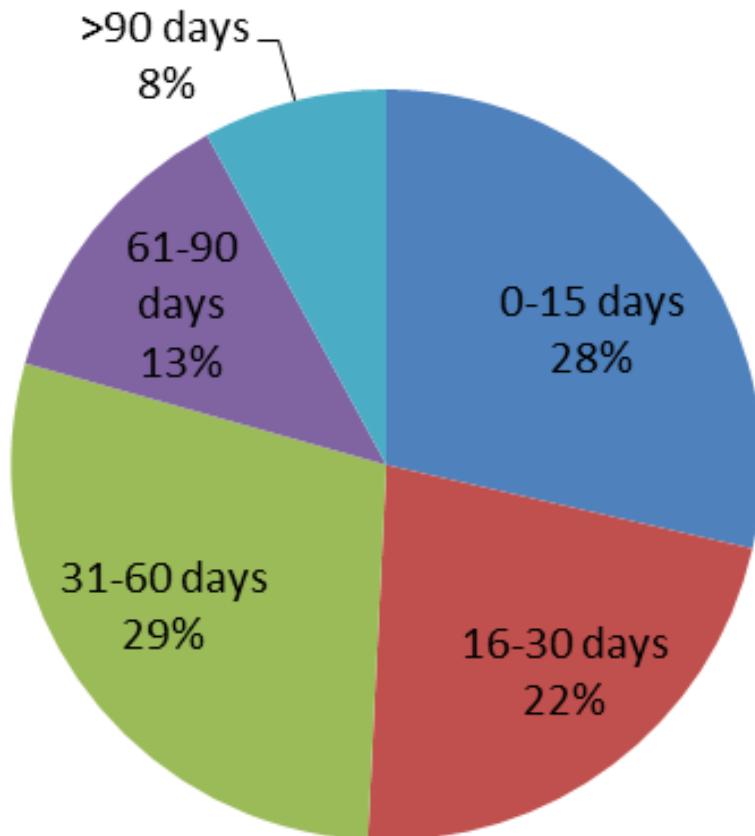




# Advisory Length



- In general, these advisories lasted less than 60 days

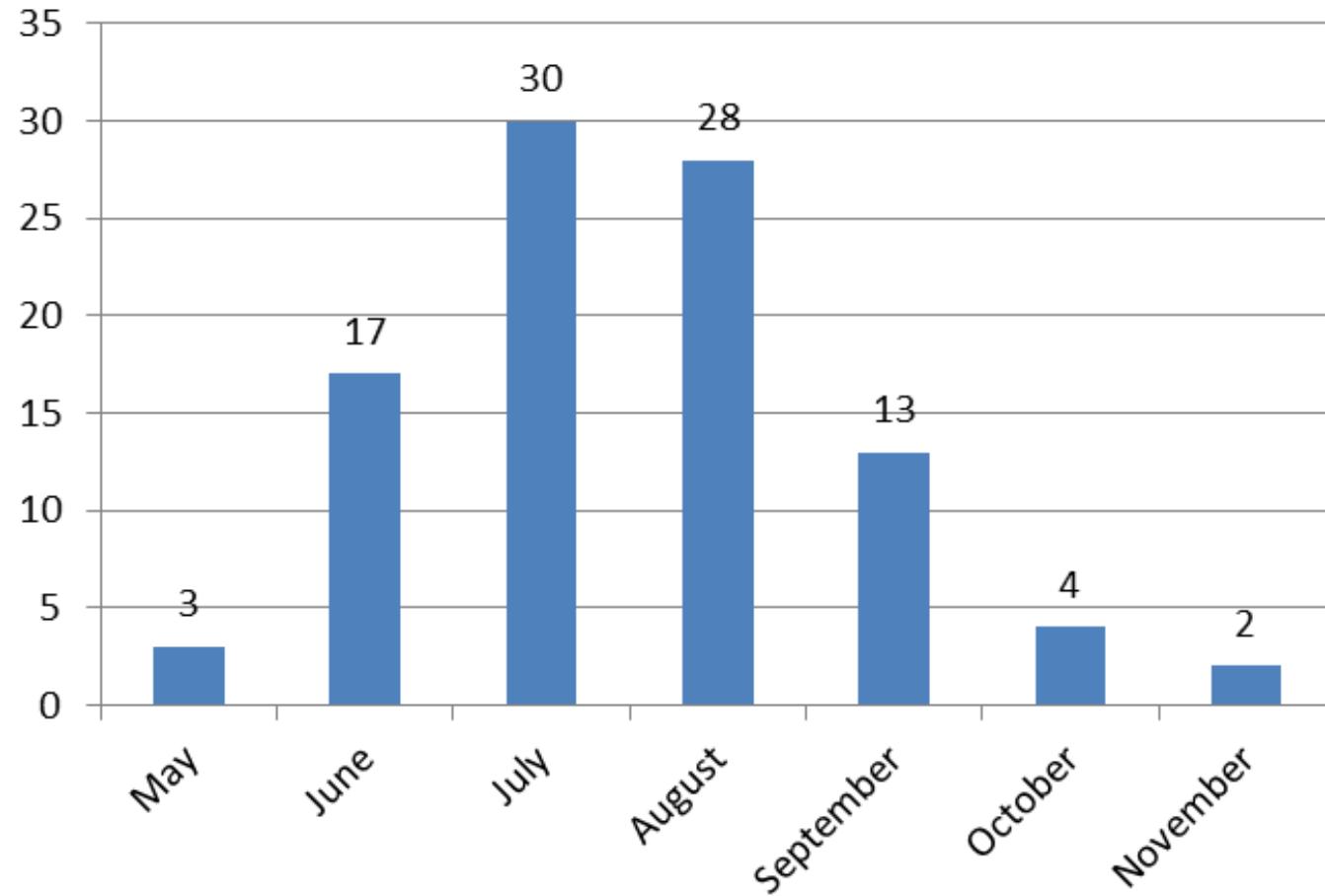




# Advisory Issuance by Month



- Majority of advisories issued in July and August

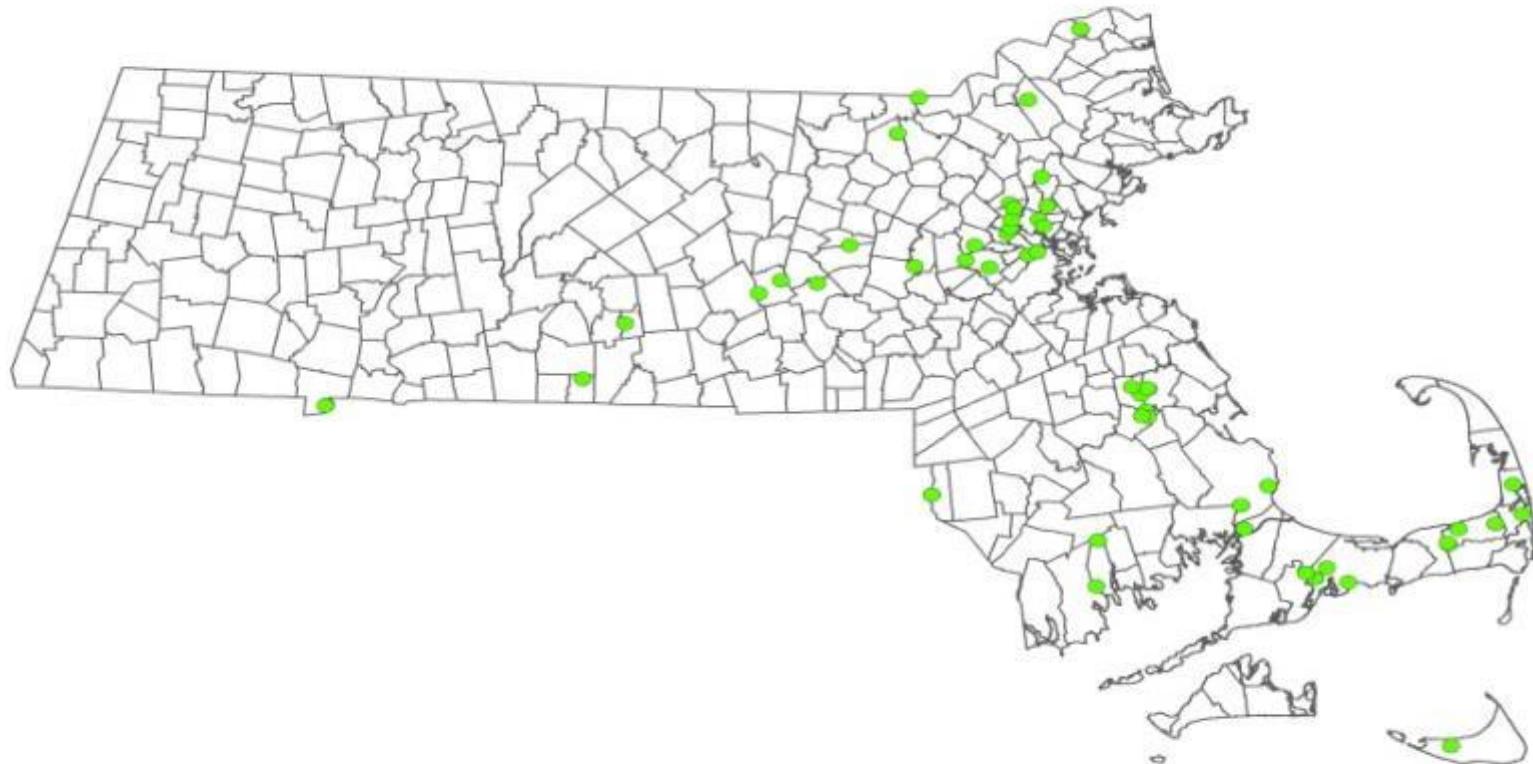




# Advisory Locations



- Locations tend to be in Eastern Massachusetts





# Lessons Learned



- HABs are a common in Massachusetts
  - Tend to be concentrated in eastern Massachusetts
  - Most frequently occur in the summer months
  - May continue into the fall
- Mutual reliance
  - MDPH relies on local officials/residents to report blooms
  - Local officials rely on MDPH to provide technical and analytical support
- Monitoring is resource intensive



# Lessons Learned



- Photographs are important!
  - A significant number of blooms are identified by photographed scums
  - Helps to limit responding to issues that are clearly not HAB-related



Likely a HAB



Not Likely a HAB



# Lessons Learned

- Great deal of public interest in this issue
- Sampling of media reports from 2015:



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## High algae counts close West Monponsett Pond

JULY 23, 2015 BY DEBORAH ANDERSON, EXPRESS STAFF



The Halifax Board of Health has closed West Monponsett Pond to fishing, boating and water recreation in the wake of an algae count slightly higher than the level recommended by the Commonwealth.

The BOD tests the water of each pond weekly on Tuesdays, with the results back to the town on Thursdays. The last test showed West Monponsett Pond at 75,000 cells/ml, slightly higher than the maximum recommended of 70,000 cells/ml.

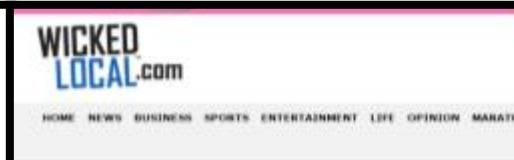
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## Toxic algae closes down Jamaica Pond

By [Alexandria Kotsikidis](#) | GLOBE CORRESPONDENT JULY 14, 2015

The Boston Public Health Commission has issued a health advisory and halted all water activities at Jamaica Pond because of a recent growth of toxic algae in the water, officials said.

Visitors to the pond will not be allowed to swim, boat, or fish, or let their dogs swim in or drink from the water for as long as the algal bloom persists, the health commission said in a statement.



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## Harmful algae forces restrictions at Brookline Reservoir

By [Erin Clussey](#) [eclussey@wickedlocal.com](#)

Posted Jul. 20, 2015 at 2:39 PM

Updated Jul. 20, 2015 at 2:50 PM

BROOKLINE

Residents are being told to keep their dogs their children out of the Brookline Reservoir after state health officials found blue-green algae floating on the surface.

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## Sudbury's Willis Pond now safe

By [Brittany McNamara](#) | Daily News Staff

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The Boston Globe logo: Menu The Boston Globe Metro BUY TICKETS Hundreds of Cheers, Beer, Wine and More

## Charles River bacteria levels prompt health advisory

Comments 0

By [Erin Clussey](#) [eclussey@boston.com](#)

Posted Jul. 20, 2015 at 2:39 PM

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CHARLES RIVER

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## Town of Orleans issues health advisory for Uncle Harvey's Pond

People should avoid contact due to high bacteria levels.

ARTICLE | [TOWN NEWS](#) | AUGUST 31, 2015 05:00 AM | BY CAPECODTODAY STAFF



# Future Efforts



- Harmonize MDPH guidelines with evolving federal guidance
- Use data for development of predictive models
- Continue to provide analytical and technical assistance to local health officials, requesting agencies, and others



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The content of this presentation and the views expressed by the authors do not necessarily reflect the official views of our federal partners.

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