

MDPH Cyanobacteria Monitoring in Massachusetts



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MDPH Involvement with HABs

- In 1998, dog deaths were reported at Nickerson State Park in Brewster.
- The deaths were caused by exposure to blue-green algae.
- MDPH has continued to receive bloom reports since that time.

MDPH Guidelines for Freshwater

- MDPH developed a protocol with guidelines for issuing advisories in response to HABs (see website www.mass.gov/dph/environmental_health)
- Advisories are recommended when either a visible cyanobacteria scum or mat is present or the analyses of water samples for algae cells or toxin levels exceed guideline levels:
 - a. A cell count exceeds 70,000 cells/mL
 - b. A microcystin toxin level exceeds 14 ppb

CDC Cooperative Agreement

- In late 2008, MDPH/BEH was one of 10 state agencies awarded funding from CDC to conduct HAB monitoring.
- Evaluate potential health impacts from HABs by collecting and analyzing environmental and health data.
- CDC is interested in both human and animal health data (e.g., fish kills, pet poisonings).

Overall Goals of Algae Project

- Monitor selected water bodies with a history of blooms
- Respond to reports of blooms and collect samples as necessary
- Prevent exposures by recommending advisories as warranted

HAB Monitoring

- Collect data on physical, chemical, and biological parameters (e.g., dissolved oxygen, chlorophyll a, nutrient levels, algae IDs and counts, microcystin levels, Secchi disk depth).
- Advisories are recommended when data show high levels of cyanobacteria or toxin.

Sampling Procedure

- According to the MDPH Quality Assurance Project Plan, samples must be collected at 1 meter depth, six inches below the surface.
- Depth is fixed but lateral location is not. Sampling site is chosen based on bloom appearance to target worst case scenario.
- Samples must be placed on ice and analyzed for cell count and identification within 24 hours of collection.

HAB Sampling, 2009

- In total, 151 samples were collected by MDPH from June 18 to November 23.
- 21% of these samples exceeded the guideline level of 70,000 cells/ml.
- Samples were also collected by watershed associations, DEP, Army Corps, and volunteers.

HAB Sampling, 2009

- In total, 32 waterbodies were sampled.
- 24 advisories were recommended to local health or other agencies (e.g., DCR, Army Corps of Engineers).
- Some waterbodies had more than one advisory.

Routine Sampling

- MDPH collected samples on a weekly basis for 12 weeks at five locations.
- Locations were chosen based on past bloom history as reported to MDPH.
- Samples were analyzed for a variety of parameters including nutrient data, dissolved oxygen, chlorophyll a, algal cell counts and identifications, and microcystin levels.

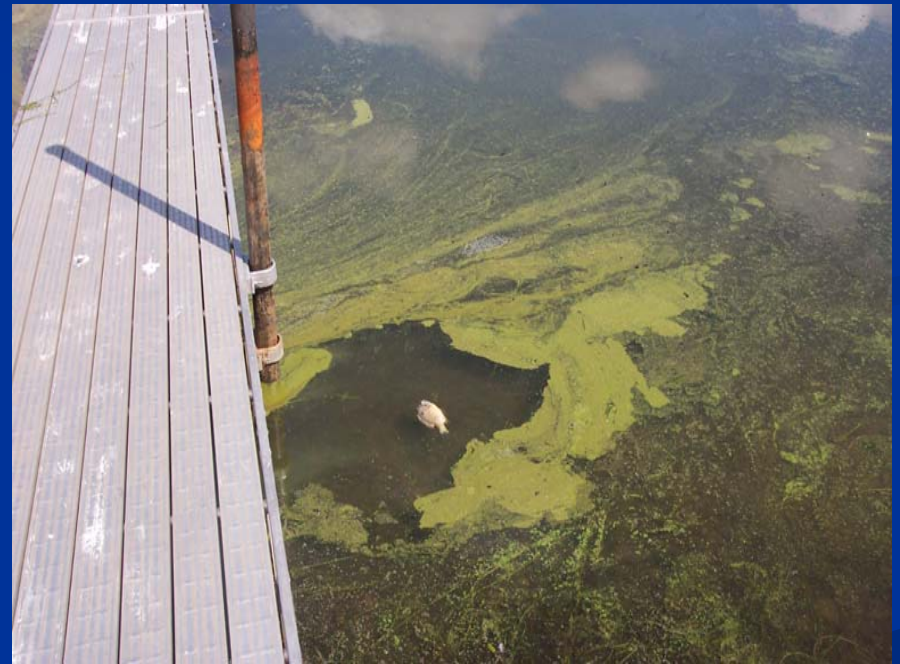
Bloom Response Sampling

- MDPH responded to 28 reports of blooms in various cities and towns. Of those, 20 were confirmed to be blooms and resulted in advisories
- Samples were collected and analyzed for same parameters as routine samples
- Reports came from DEP, BOHs, residents, and watershed associations
- Advisories were recommended for as long as cell counts remained high

Lake Attitash, Amesbury/Merrimac

- A bloom was reported to MDPH by researchers from UNH working in conjunction with EPA.
- The bloom persisted for 8 weeks, during which time an advisory was continuously posted.
- Maximum cell count was 350,000 cells/ml, and a visible scum was present on two occasions.
- A fish kill was observed at this lake during the bloom.

Lake Attitash, Amesbury/Merrimac



Human Health Effects, 2009

- MDPH received 3 reports of potential health effects in humans related to HABs (Note: 2009 season was limited to passive surveillance).
- Of these 3, we were only able to conduct an interview for one of the cases.
- The case was deemed a suspect human illness.
- A six year old girl experienced coughing, a sore throat, ear pain, and pink dots on her body after swimming.

Animal Health Effects 2009

- The fish kill observed at Lake Attitash in Amesbury/Merrimac was reported to CDC.
- Fish kills can occur from algal toxins or low dissolved oxygen, which can result from algal decomposition, or naturally from warm temperatures.
- More than 50 dead fish were seen on two separate occasions.

Future Plans

- Create and publish a brochure on HABs for local health, the general public, and others.
- Improve amount and quality of information on MDPH website.
- Work collaboratively with hospitals, Poison Control, and veterinarians to monitor and report potential HAB-related illnesses in humans and animals.

MDPH Contact Information

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