Cyanobacteria at Crystal Lake 2012

Presented by:
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What are cyanobacteria?

- Also known as blue-green algae
- Bacteria that grow in water and multiply quickly to form scum or blooms
- Two most prominent types are Microcystis and Anabaena
- Some strains in each of these species can produce toxins – Microcystis predominantly a liver toxin and Anabaena predominantly a neurotoxin

Key Contributors to Cyanobacteria Blooms

- High nutrient levels especially nitrogen-to-phosphorus ratios
- Warm water temperatures
- Low streamflow

What are the routes of exposure?

- Swallowing
- Skin contact
- Inhalation

What are the health risks of cyanobacteria exposure?

- Skin rashes
- Gastrointestinal upset
- Respiratory irritation rarely pneumonia
- Liver injury
- Neurotoxin effects
- Deaths reported in animals, especially dogs

Massachusetts State Thresholds for Cyanobacteria Advisories

- 70,000 cells/mL
- Toxin 14 ppb

Newton 2012 Data

Date	Total cells/mL	Species	Toxin*
7/30	133,000	Anabaena 110,000 Microcystis 20,000 Nostoc 3,000	<1 ppb
8/6	83,000	Anabaena 83,000	<1ppb
8/13	81,700	Anabaena 81,700 Aphanizomenon 13,000 Cylindrospermium 4,700	<1 ppb
8/20	51,000	Aphanizmenon 51,000	<1 ppb
8/27	8,200	Anabaena 4,700 Pseudanabaena 3,500	<1 ppb
9/6	118,500	Anabaena 58,000 Microcystis 47,000 Pseudanabaena 7,700 Gomphosphaeria 5,800	<1 ppb
9/10	213,000	Anabaena 150,000 Gomphosphaeria 50,000 Chroococcus 13,000	<1 ppb
9/17	24,000	Anabaena 24,000	<1 ppb
9/24	26,200	Anabaena 19,000 Cylindrosperium 7,200	<1 ppb

*Microcystins only toxin tested for

Possible Preventive Actions

- Air bubbling devices
- Increased water flow -- expensive
- Compounds to chemically-precipitate phosphorus followed by dredging – very expensive

Mitigation Measures

- Even more expensive than preventive actions
- May not reduce harmful cyanobacteria while decreasing overall numbers
- Efforts that lyse cells can release and actually increase toxin levels
- Basically reserved for bodies of water used for drinking water