

Research Needs

There are many unknowns about cyanobacteria. This list focuses on questions of immediate relevance to bloom prevention/management, public health risk, or areas for which there is little New Hampshire-specific information.

Better Understand Bloom Dynamics:

- How is climate change affecting the frequency/severity/duration/toxicity of blooms in NH?
- Under what conditions do blooms occur in New Hampshire rivers and what can be done to address them?
- How do winter dynamics contribute to summer blooms?
- How prevalent are winter blooms in NH? What types of lakes do they occur on?
- Does fish stocking affect the likelihood of cyanobacteria blooms?
- W Better understand lakes that bloom but don't have internal loading.
- Evaluate the effectiveness of treatments to prevent or eliminate blooms.
- Does in-Lake treatment of aquatic invasive species affect the likelihood of cyanobacteria blooms?
- Develop a list of priority waterbodies for regular data collection to try to determine trends in bloom frequency/duration/severity.

Improve Ability to Predict Blooms:

- Collect and review water quality data, bathymetry, weather/climate information, land use, and other information to predict and/or prevent blooms.
- How can satellite data be used to inform monitoring efforts?
- Use risk mapping/modelling to indicate lakes and rivers likely to bloom regularly.
- How can monitoring data about sediment anoxia inform our understanding of blooms?
- How can satellite and remote sensing data be used to monitor or predict blooms on smaller lakes of the size relevant in NH?
- What factors would contribute to an ability to predict the timing, species composition, and toxicity of CyanoHABs (including enviro triggers for toxicity)?

Improve Understanding of Public Health Risks:

- What risk, if any, is posed by consumption of fish from waterbodies with cyanobacteria blooms?
- Under what conditions are private wells at any risk when a nearby surface water is blooming?

Assess the Social Impacts of Cyanobacteria Blooms:

- What are the environmental justice implications of blooms for public access?
- Provide data to develop a national cost-benefit analyses for mitigation/control/prevention.

Expand Knowledge of Cyanotoxins in New Hampshire Waterbodies:

- How does nitrogen affect the production of microcystin or other toxins in NH?
- Need to understand the toxins that do not currently have an established health advisory level.

- How frequently should a bloom be retested for toxicity in order to document changes meaningful to public health?
- Explore picoplankton dynamics and potential cyanotoxin production in picocyanobacterial blooms.
- Do toxins bioaccumulate to loons and other higher trophic species, and if so, with what effect(s) in New Hampshire?
- Explore different methods of testing for toxin presence, concentration, or a bloom's potential to create toxins. How can we more efficiently and cost-effectively test for toxins?
- Explore the use of e-DNA information to inform understanding of potential toxicity of blooms
- Use e-DNA and genomic information to better understand picocyanobacteria dynamics in NH lakes