

Library Reference 2.2.9

Progress toward water quality improvement: Phytoplankton. AMP 2011 Annual Report.  
(Assessment Measure)

**AMENDED CONSENT JUDGMENT GOAL**

Reduce the frequency, magnitude and duration of elevated chlorophyll-a concentrations in Onondaga Lake during the recreational period. Reduce the abundance of cyanobacteria (blue-green algae) in phytoplankton biomass

Hypotheses to be tested:	Status:
Metro improvements and watershed phosphorus load reductions result in lower biomass of phytoplankton in Onondaga Lake.	<ul style="list-style-type: none"> <li>Since Metro improvements have reduced phosphorus loading to the lake, the biomass of phytoplankton in the lake has also declined.</li> </ul>
Metro improvements and watershed phosphorus load reductions, reflected in a higher N:P ratio, result in reduced importance of cyanobacteria to the lake's phytoplankton biomass.	<ul style="list-style-type: none"> <li>Since Metro improvements have reduced phosphorus loading to the lake, the proportion of cyanobacteria in the phytoplankton community has also declined.</li> </ul>

**Current Conditions with Historical Comparison**

Biomass <i>(Annual average January-December (standard deviation))</i>	1998-2004: 4.1 mg/L (1.9 mg/L) 2005-2009: 1.2 mg/L (0.48 mg/L) 2010: 1.25 mg/L 2011: 1.27 mg/L										
Community Composition <i>(Jun-Sept average biomass (standard deviation))</i>	<table border="1"> <thead> <tr> <th></th> <th><u>Cyanobacteria</u></th> </tr> </thead> <tbody> <tr> <td>1998-2004:</td> <td>29% (10%)</td> </tr> <tr> <td>2005-2009:</td> <td>1.6% (1.1%)</td> </tr> <tr> <td>2010:</td> <td>0.6%</td> </tr> <tr> <td>2011:</td> <td>2.5%</td> </tr> </tbody> </table>		<u>Cyanobacteria</u>	1998-2004:	29% (10%)	2005-2009:	1.6% (1.1%)	2010:	0.6%	2011:	2.5%
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Factors affecting algal community	Nutrients, light, temperature, grazing pressure from <i>Daphnia</i>										

**Monitoring and Assessment Program**

Lake Monitoring <i>(Annual County monitoring program)</i>	Biweekly sampling events: <ul style="list-style-type: none"> <li>Phytoplankton abundance (number per liter)</li> <li>Biomass (mg/l)</li> <li>Composition of the algal community (7 major groups)</li> <li>Cell size divisions (nannoplankton and netplankton)</li> </ul> Metrics to track over time: <ul style="list-style-type: none"> <li>Percent of major taxa</li> <li>Cyanobacteria relative importance</li> <li>Shifts in N:P ratio of lake water</li> <li>Biomass trend</li> </ul>
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**Tools for Decision Making**

Model	Onondaga Lake Water Quality Model (under development by Anchor QEA,LLC)
TMDL Allocations	Phosphorus - NYSDEC Phase I TMDL 8/27/97; Phase II TMDL pending