

Library Reference 2.2.3

Progress toward water quality improvement: Secchi Disk Transparency. AMP 2011 Annual Report. (Guidance Value)

**AMENDED CONSENT JUDGMENT GOAL**

Eliminate turbidity as an impairment to use of the lake for water contact recreation. Improve water clarity to meet aesthetic quality and public bathing beach safety objectives for areas of the lake designated as public beaches.

**Hypotheses to be tested:**

**Status:**

Metro improvements and related nutrient load reductions result in improved water clarity (as measured by Secchi disk transparency) in Onondaga Lake	<ul style="list-style-type: none"> <li>• Since the 1990's, there has been an increase in the percent of summer Secchi disk measurements that exceed 1.5 m at the South Deep station</li> <li>• Over the past ten years of monitoring at the nearshore stations, there has been an increase in the percent of summer Secchi disk measurements that exceed the NYS DOH 1.2 m safety guidance value for bathing beaches.</li> </ul>
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**Current Conditions with Historical Comparison**

Secchi Disk Transparency <i>(Jun 1 to Sep 30 average (standard deviation))</i>	<u>Time Period</u>	<u>South Deep Station (m)</u>	<u>Nearshore Stations (Class B &amp; C) (m)</u>
	1990-1997:	2.1 (0.47)	No data 1990 - 1998
	1998-2004:	1.9 (0.37)	1.5 (0.21) <i>(starting 1999)</i>
	2005-2009:	2.5 (0.93)	1.6 (0.31)
	2010:	1.9	1.3
	2011:	2.1 (0.32)	1.3
Compliance with NYS AWQS and Guidance Value <i>(Jun 1 to Sep 30 average (standard deviation); No NY State standard or guidance value for Secchi disk transparency. NYS DOH bathing beach swimming safety guidance value of 1.2m)</i>	<u>Time Period</u>	<u>South Deep measurements % greater than 1.5 m</u>	<u>Nearshore (Class B &amp; C) % greater than 1.2 m</u>
	1990-1997:	54% (25%)	No data 1990 - 1998
	1998-2004:	62% (20%)	70% (15%) <i>(starting 1999)</i>
	2005-2009:	80% (17%)	86% (11%)
	2010:	75%	89%
	2011:	93%	63%
	<u>2011 - Nearshore Stations Class B % measurements greater than 1.2 m</u>	<u>2011 - Nearshore Stations Class C % measurements greater than 1.2 m</u>	
	Bloody Brook: 90%	Ninemile Creek: 90%	
	Eastside: 100%	Harbor Brook: 79%	
	Maple Bay: 75%	Ley Creek: 85%	
	Wastebeds: 100%	Mid-south: 75%	
	Willow Bay: 95%	Onondaga Creek: 0%	

Factors Affecting Water Clarity

Algal abundance (depends on light, temperature, nutrients and grazing pressure), external loading of suspended solids, re-suspension of bottom sediments, precipitation of calcite, suspension of sediment from tributary high flow

**Planned Load Reductions (1998 – 2012)**

Metro SPDES Permit Requirement

- No SPDES requirement for Secchi disk transparency
- Staged reduction in total phosphorus load from Metro
- Staged implementation of CSO and watershed projects to reduce phosphorus loading from nonpoint sources

**Monitoring and Assessment Program**

Lake Monitoring  
*(Annual County monitoring program)*

- Biweekly measurements of Secchi disk at South Deep (weekly between 5/1 and 9/30)
- Nearshore Secchi disk measurements: weekly (summer). and following storm events

Related Biological Monitoring

- Phytoplankton and zooplankton abundance and community composition
- Alewife hydroacoustic surveys

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(Guidance Value) – *continued*

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**Tools for Decision Making**

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Models

- Mass balance TP framework and linked empirical eutrophication model (William Walker)
- Onondaga Lake Water Quality Model (Anchor QEA,LLC)

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TMDL Allocations

Phosphorus - NYSDEC Phase I TMDL 8/27/97; TMDL for Phosphorus was updated in 2012 and approved by the USEPA on June 29, 2012.

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