

Library Reference 7.5.1

Mercury is one of the industrial contaminants of concern for Onondaga Lake. The County has been monitoring mercury concentrations in the lake since 1998.

In Onondaga Lake, samples are collected from upper and lower waters and analyzed for ultra low-level mercury and methyl mercury both when the lake is thermally stratified and when the lake is fully mixed.

In the lower waters during the period of stratification, anoxic conditions allow bacteria to convert mercury into methyl mercury, a more toxic form that is readily bioaccumulated by aquatic organisms. This process of biomethylation allows mercury from the sediments to migrate into the water column. Historically, there has been a pattern of peak mercury levels in late summer and early fall, typical of data collected since 1999, which is consistent with the conceptual model of mercury cycling in productive lakes (see, for example, Driscoll et al. 1995<sup>1</sup>).

***Ultra low-level mercury sampling, Onondaga Lake 2009.***

Sampling Event	Location and Depth	Total Hg (ng/l)	Methyl Hg (ng/l)	Detection Limits (ng/l)	
				Total Hg	Methyl Hg
April 21, 2009	South Deep 3m	2.31	na	0.50	0.050
Lake fully mixed	South Deep 18m (Dup)	2.82 (2.66)	na (na)		
	North Deep 3m	2.50	na		
	North Deep 18m	2.82	na		
June 29, 2009 Stratified	South Deep 3m	3.25	0.085	0.5	0.050
	South Deep 18m (Dup)	3.27 (3.35)	<0.050 (<0.050)		
	North Deep 3m	1.95	0.063		
	North Deep 18m	2.15	<0.050		
August 25, 2009 Stratified	South Deep 3m	na	na	na	na
	South Deep 18m (Dup)	na (na)	na (na)		
	North Deep 3m	na	na		
	North Deep 18m	na	na		
October 8, 2009 Lake fully mixed	South Deep 3m	7.02	0.325	0.5	0.050
	South Deep 18m (Dup)	12.6 (12.4)	0.491 (0.396)		
	North Deep 3m	2.71	0.616		
	North Deep 18m	4.40	4.44		

*Notes:*

na – sample not analyzed due to quality control issues with sample delivery (cooler temperature and holding time)

Ultra low-level mercury analyses (EPA Method 1631) were performed by Frontier Geosciences, Inc.

Detection limit is shown as minimum reportable limit (MRL).

Duplicate RPDs - the target for field duplicate RPDs is not to exceed 20%:

4/21/2009 – Hg = 5.8%; MHg = na

06/29/2009 – Hg = 2.4%; MHg = 0%

08/25/2009 – na

10/08/2009 - Hg = 1.6%, MHg = 21%

<sup>1</sup> Driscoll, C. T., V. Blette, C. Yan, C.L. Schofield, R. Munson and J. Holsapple. 1995. The role of dissolved organic carbon in the chemistry and bioavailability of mercury in remote Adirondack lakes. *Water, Air & Soil Poll.* 80(1-4), p. 499-508.