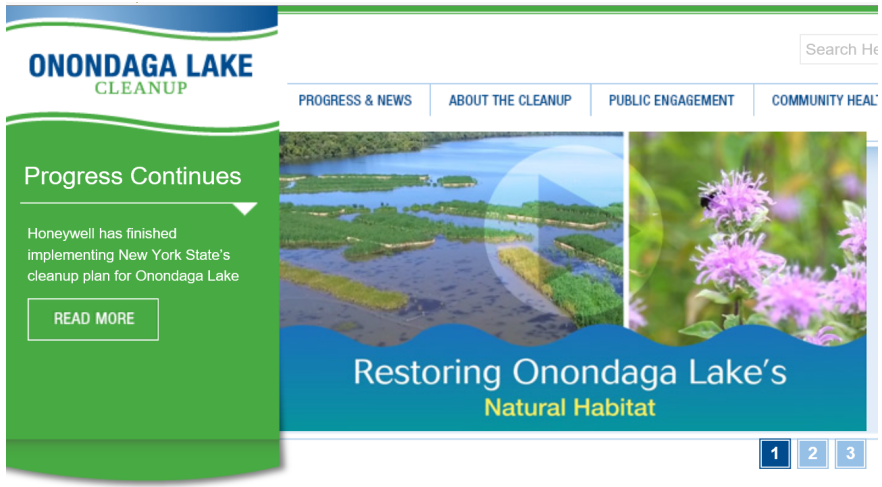
ONONDAGA LAKE
SYRACUSE, NY

BETSY HENRY, ANCHOR QEA

Onondaga Lake Site Overview

Multi-Member, Multi-Year Team Effort

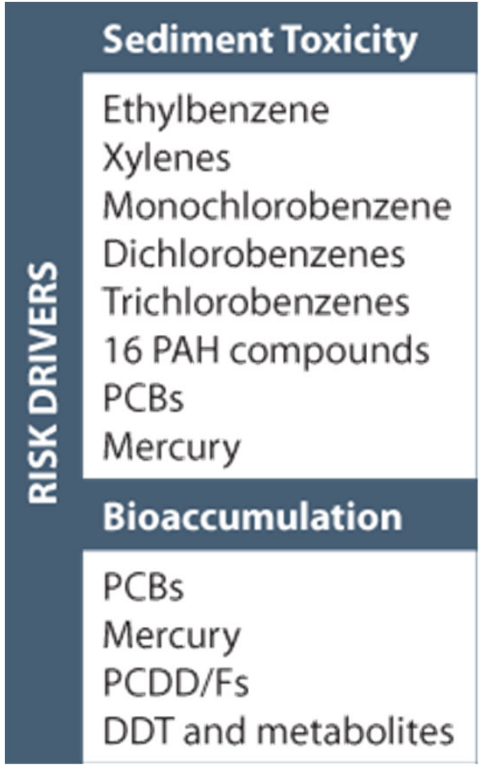


"Honeywell has been working closely with Central New York partners including State University of New York College of Environmental Science and Forestry (SUNY-ESF), Parsons, OBG, Anchor QEA, Syracuse University, Audubon, Upstate Freshwater Institute, Sevenson Environmental Services and hundreds of scientists, engineers, and skilled craft laborers to clean up and return Onondaga Lake to the community as a healthy, sustainable asset for future generations."

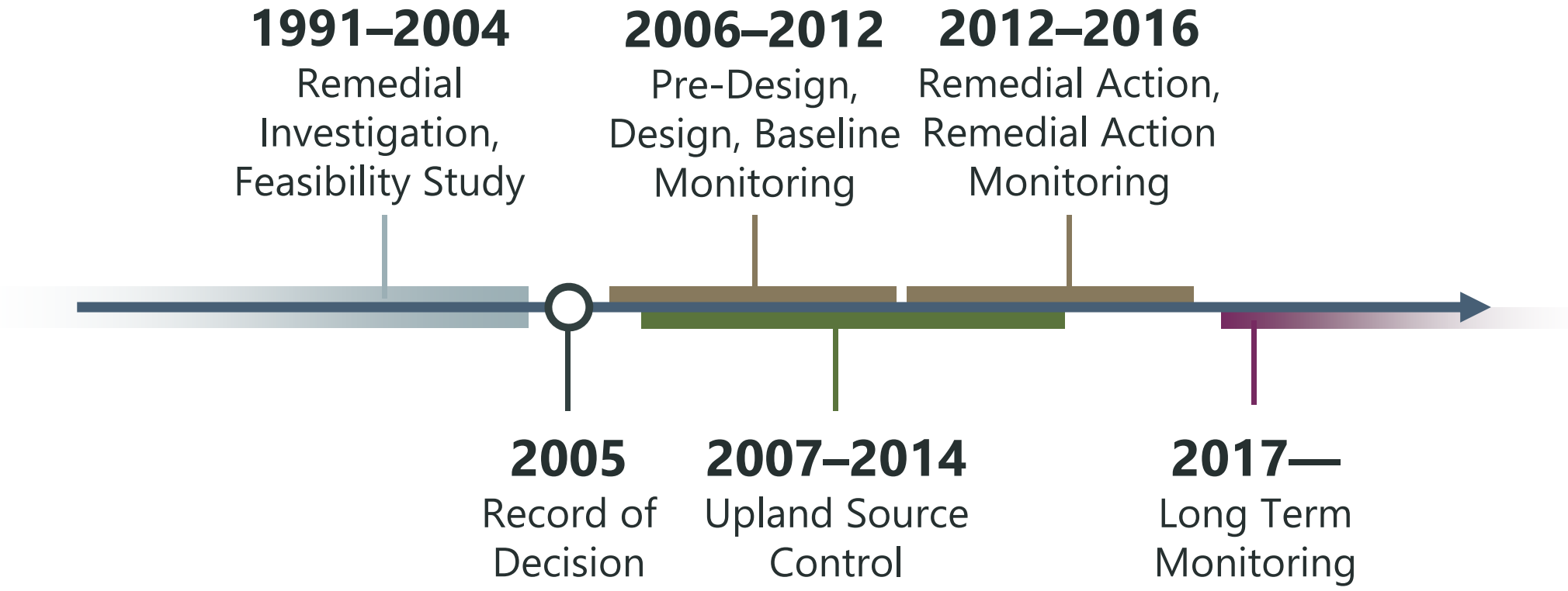
Source: http://www.lakecleanup.com/

Objectives of Remediation

- Reduce mercury methylation in hypolimnion
- Reduce release of contaminants from littoral sediment
- Reduce release of mercury from profundal sediment
- Reduce adverse effects on fish, wildlife, and humans
- Achieve surface water quality objectives



Timeline


1991–2004
Remedial Investigation, Feasibility Study
2006–2012
Pre-Design, Design, Baseline Monitoring
2012–2016
Remedial Action, Remedial Action Monitoring
2005
Record of Decision
2007–2014
Upland Source Control
2017—
Long Term Monitoring

Summary of Remedy

Dredging

Capping

Habitat Restoration

Source Control

Nitrate Addition and MNR

Significant Remedy Scope or Schedule Deviations

- Dredging completed 1 year ahead of schedule
- Addition of GAC and siderite to cap to improve chemical sorption and adjust pH
- Compliance with more stringent ammonia discharge limits based on TMDL

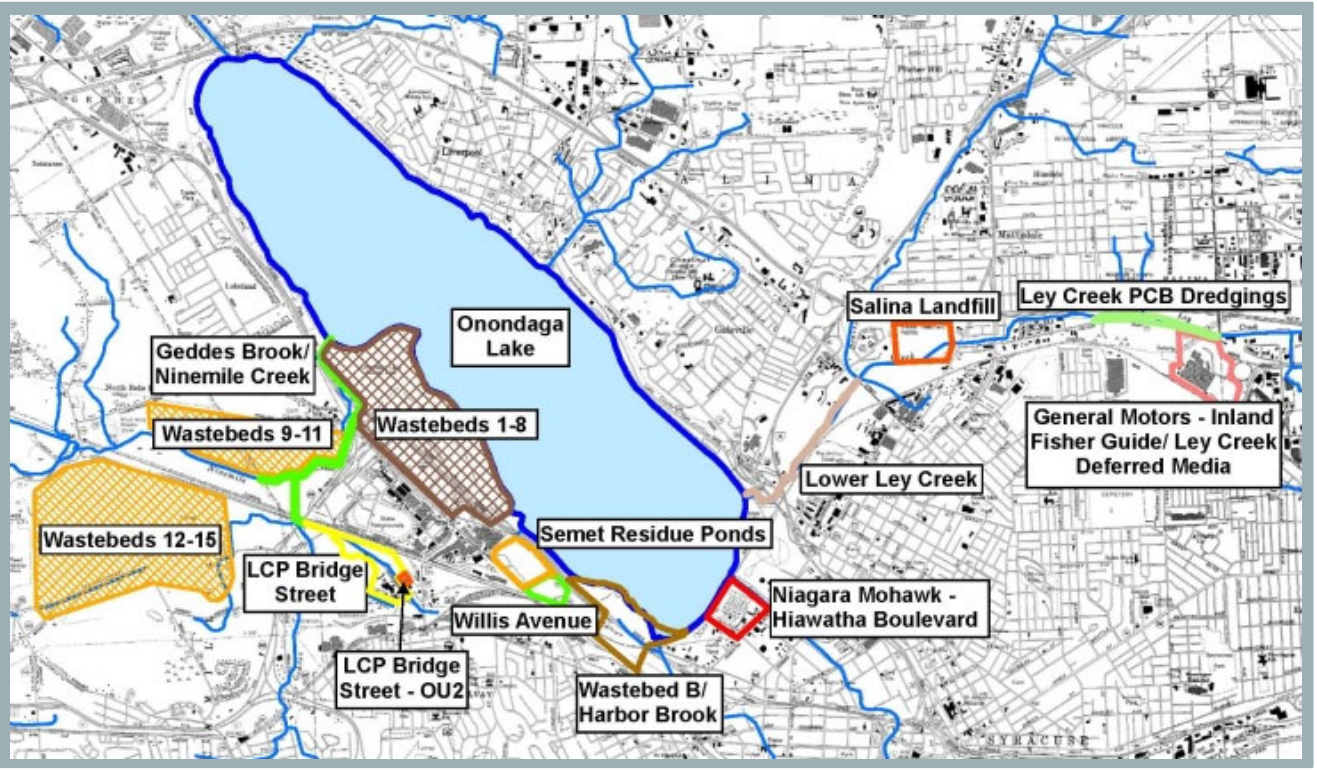
Explanations of Significant Differences
Adjustments to removal prism and barrier wall based on stability concerns (2006)
Novel use of nitrate addition to reduce methylmercury release from profundal sediment (2014)
Modified protective cap (2018)

When Were External Sources Characterized and Addressed?

Honeywell sources

- LCP Bridge Street (2008)
- Lakeside barrier wall (2012)
- Wastebeds 1-8 (2012)
- Geddes Brook/ Ninemile Creek (2014)
- Wastebed B/Harbor Brook (2012+)

Source: https://www.dec.ny.gov/lands/72949.html



Primary Pre- and Post-Remedy Effectiveness Monitoring Elements

Media	Analytes
Sediment (capped areas)	Multiple chemicals
Porewater (capped areas)	Multiple chemicals
Profundal sediment	Mercury
Sport fish and prey fish	Mercury, PCBs, PCDD/Fs, DDT and metabolites
Surface water	Mercury, VOCs, SVOCs
Habitat	Plant and fish community surveys, wildlife usage

Note: Mercury is the only analyte with a remedial goal in fish tissue. Others have “targets” to help assess recovery.

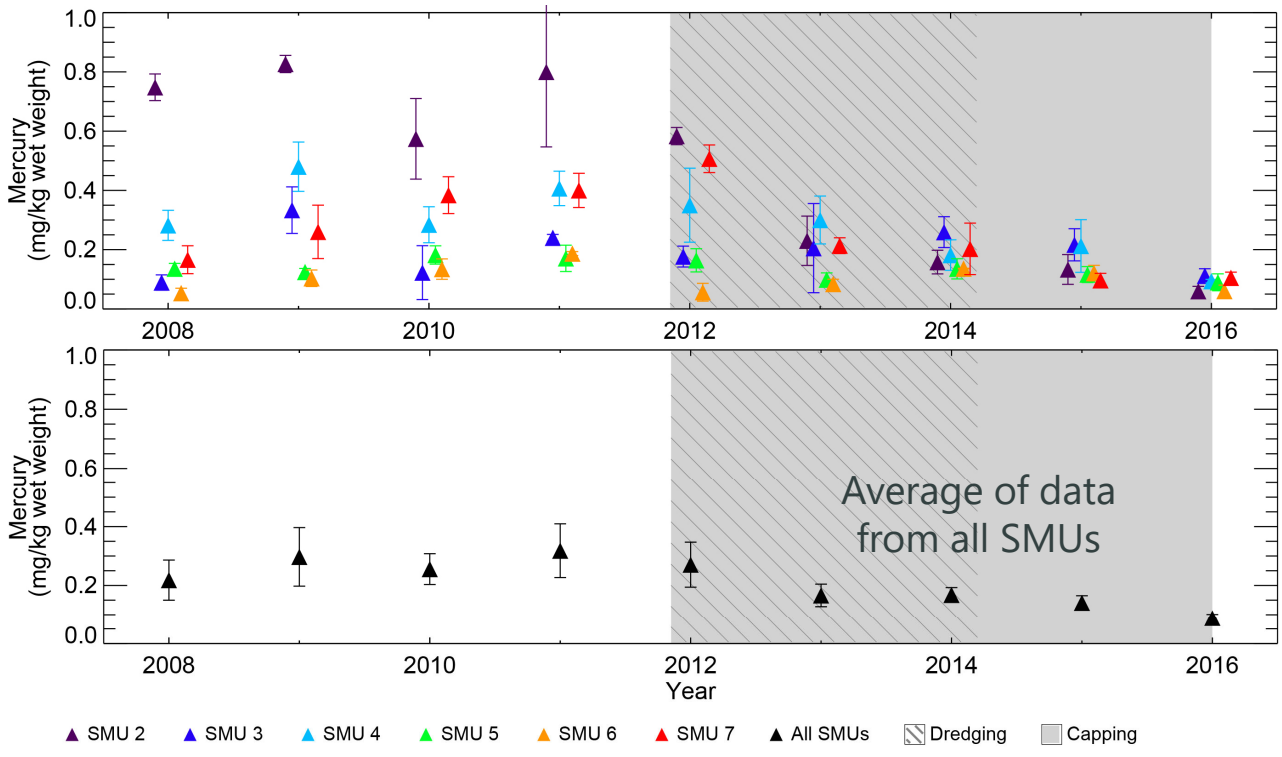
Did the Remedy Achieve Short- and/or Long-Term Remediation Objectives for Surface Sediment?

Littoral Sediment	Profundal Sediment
• Objectives achieved upon completion of dredging and capping • Cap monitoring ongoing	• Decline in mercury in surface sediment proceeding consistent with or faster than expected • Sediment monitoring ongoing

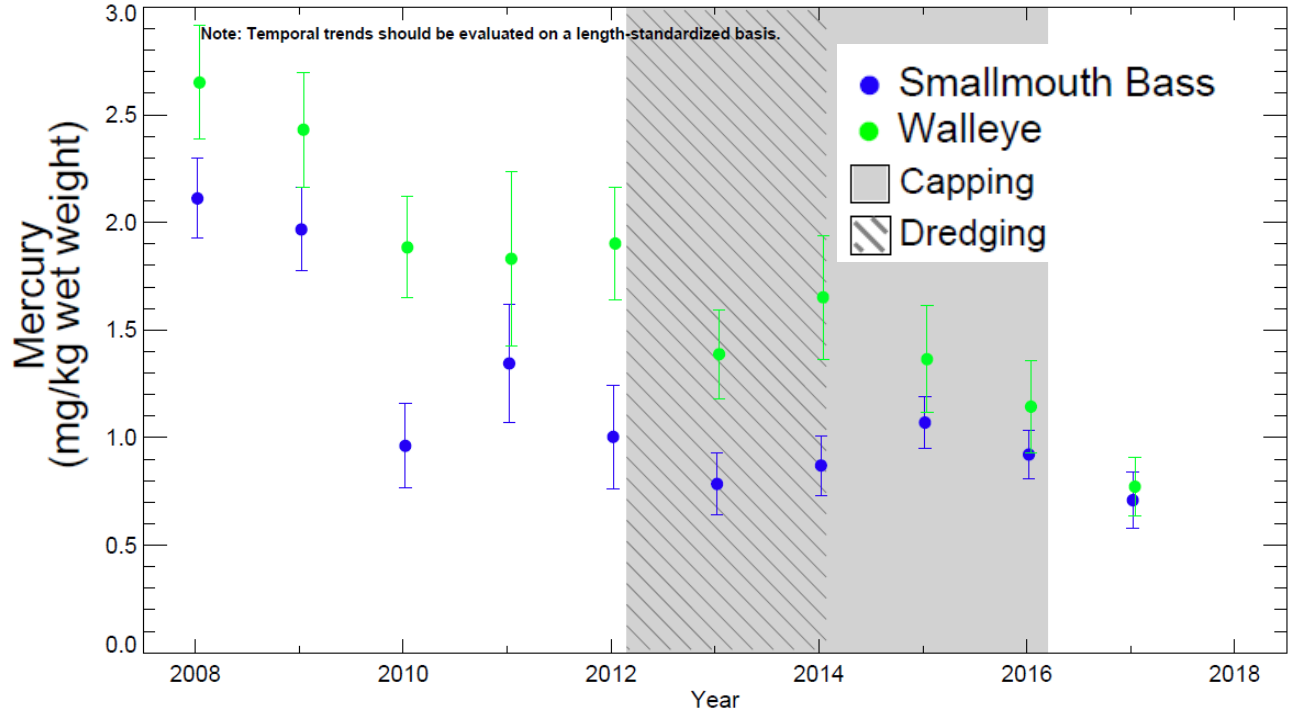
Is the Remedy on Track to Achieve Long-Term Remediation Objectives for Water and/or Biota?

Media	On Track?	Notes
Surface water	Yes	Water quality much improved compared to pre-remediation conditions
Small prey fish	Yes	Mercury concentrations in remediated areas approaching those where no remedy required
Large prey fish	Too early to tell	No pre-remedy data
Sportfish	Mercury concentrations trending downward	Mercury concentrations in sportfish (such as walleye) in New York are sometimes above remedial goals (0.2 and 0.3 mg/kg) for Onondaga Lake

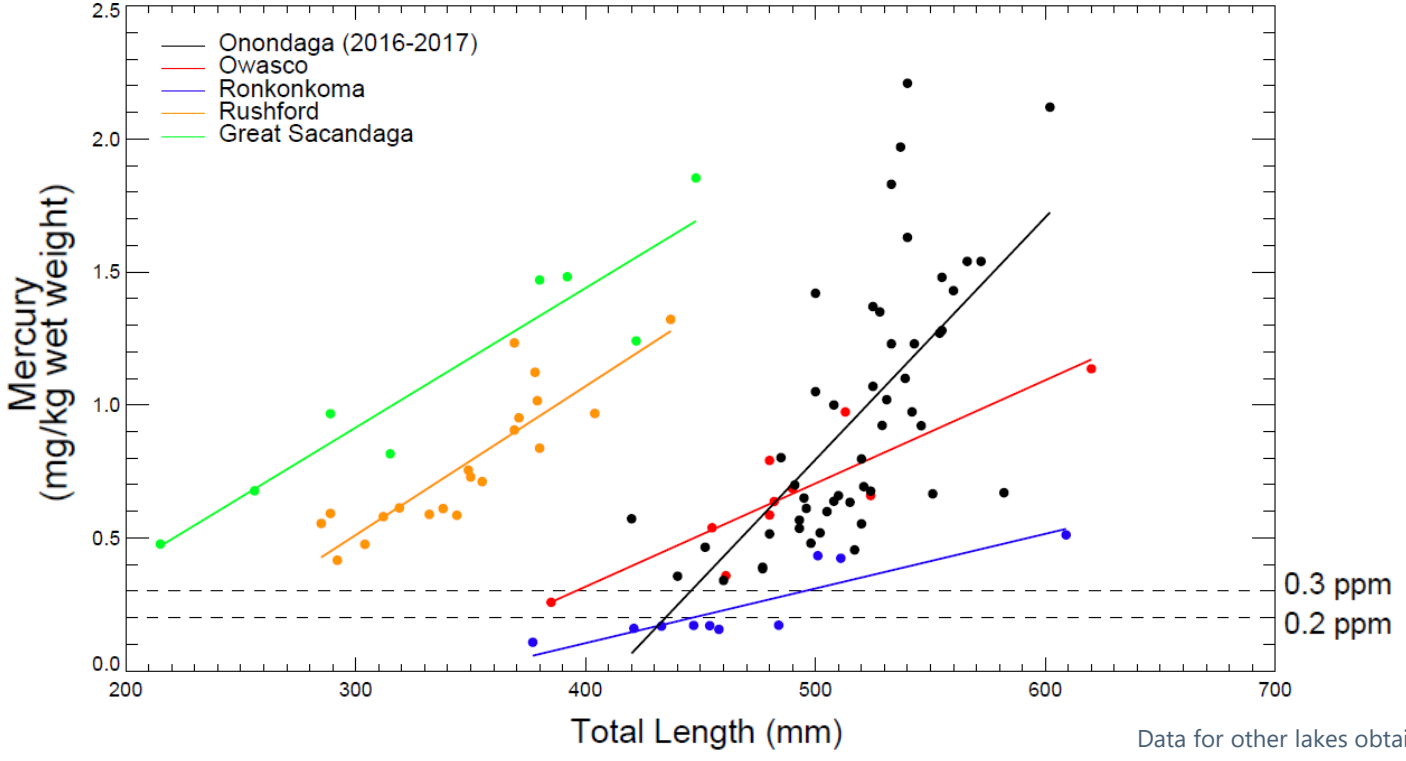
Mercury Declining in Small Preyfish with Remediation



Mercury Declining in Sportfish Prior to Remediation



Walleye in Some Other New York Lakes Exceed Mercury Goals



Data for other lakes obtained from NYSDEC.

Key Take-Home Messages

- Productive regulatory relations, strong technical position, and community engagement supported the success of the project
- Other key features
  - Integrated, sustainable restoration program
  - Adaptive technical approach
  - Robust baseline monitoring program
- For additional information, see http://www.lakecleanup.com/ and https://www.dec.ny.gov/lands/72949.html