

PFAS TESTING IN LAKE FOAM: KEY FINDINGS FROM CANANDAIGUA LAKE

INTRODUCTION & BACKGROUND

In 2023 Canandaigua Lake Watershed Association was awarded a grant from Freshwater Future to expand upon previous lake foam research. They partnered with Global Aquatic Research LLC (GAR), who investigated the potential of lake foam to accumulate emerging contaminants, including PFAS (per- and polyfluoroalkyl substances).

Background lake foam research:

- In 2019, chemical analyses were performed on Canandaigua Lake foam to determine its source. The findings suggest that *Microcystis cyanobacteria* release sugar-rich biological material into the lake water after the blooms die-off, and this material enters the surface of the water and allows it to foam when mixed by wind.
- Research in other regions shows foam can concentrate some pollutants at much higher levels than in the surrounding environment. We first looked at microcystin toxin concentrations as foam production often follows blooms, and found that foam can exceed the NYS Department of Health's recreational limit even when nearby lake water does not. These findings warranted further study on foam and other potential contaminants.



Photo from October 3, 2024 by Emily Debolt

NEW PFAS RESEARCH CONDUCTED

On October 19th, 2023 GAR collected 3 surface foam samples and 1 lake water sample at the north end of Canandaigua Lake to test for per- and polyfluoroalkyl substances (PFAS). They were analyzed for 30 PFAS compounds using EPA method 537m. The foam was analyzed as non-potable water after allowing air bubbles to dissipate (90% of foam is air). The full research data report can be found on the [CLWA website](#).

KEY FINDINGS

- Total PFAS concentrations in Canandaigua Lake water were detected at low levels of 5.4 ng/L, while foam samples showed much higher levels, averaging 385 ng/L. This means the water that makes up the foam contains over 70 times more PFAS compared to the surrounding lake water.
- Seven PFAS compounds were detected in lake water, all within enforceable safety thresholds, while up to 13 compounds were found in the foam samples, with six exceeding method reporting limits. Enforceable safety limits for foam are not yet established.
- Foam samples contained high levels of PFOS and various perfluoroalkyl carboxylic acids (PFCAs), which were not detected in the lake water.

EPA Standards PFAS in Drinking Water

Compound	MCLG*	MCL**
PFOA	0	4
PFOS	0	4
PFHxS	10	10
PFNA	10	10
HFPO-DA (GenX)	10	10
Mixtures (two or more PFHxS, PFNA, HFPO-DA & PFBS)	Index (unitless)	

*Maximum Contaminant Level Goal

**Maximum Contaminant Level (enforceable) Units are in parts per trillion (ppt or ng/L)

Info from <https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>

HEALTH IMPLICATIONS

Scientific research indicates that exposure to certain PFAS chemicals may cause adverse health effects. Ongoing studies are working to better understand how varying levels of exposure to different PFAS compounds may impact health. The [EPA website](#) is a good source of information.

While this research is non-regulatory, the findings suggest the need for continued monitoring of PFAS levels in Canandaigua Lake.

Due to the potential for foam to accumulate chemicals and toxins at greater concentrations than the surrounding water, it is best to avoid foam when possible and wash thoroughly after you come into contact with it.



Image of the foam sampled for PFAS research on October 19, 2023. Image by Rick Smith and Stella Woodard.



Example of a mid-lake foaming event, where "stripes" of foam form due to Langmuir circulation. Photo by Lindsay McMillan.

NEXT STEPS

- **Ongoing Monitoring:** Continued efforts to track and understand PFAS behavior in the lake are essential. Research is occurring across the Finger Lakes to better understand PFAS and their impacts in our local environments – in lakes, streams, and in fish.
- **Further Study:** Additional research is needed to understand where PFAS in the foam comes from and its potential environmental impact.
- **Community Involvement:** The community is encouraged to stay informed and participate in initiatives aimed at protecting the lake's health. Opportunities to volunteer and report lake foam are available with CLWA.

PARTNERS IN THIS EFFORT

This research was conducted by Global Aquatic Research with invaluable monitoring support from dedicated volunteers of the Canandaigua Lake Watershed Association. Funding was generously provided by Freshwater Future.



DISCUSSION

The Canandaigua Lake Watershed Association (CLWA), is a nonprofit organization dedicated to protecting the lake and surrounding watershed for future generations. CLWA is actively interested in understanding the causes and implications of lake foam.

PFAs levels in the Finger Lakes is an emerging area of concern. While lake foam can naturally occur, recent changes and shifts in its appearance raise questions about potential impacts on public health and the lake's ecosystem.

We encourage the public to participate by submitting foam reports on the [CLWA website](#), helping us gather essential data for ongoing research and monitoring efforts.