PFAS (per- and polyfluoroalkyl substances) in the Cayuga Lake Watershed

Community Science Institute
Partnering with Communities to Protect Water

PFAS are a group of synthetic chemicals (e.g. PFOS, PFOA....etc.) that have been widely used in consumer products and for industrial applications for their resistance to heat, oil, stains, grease and water since the 1940s. All PFAS have been made by humans or else have formed as other human-made compounds reacted in the environment. Just about every material on earth will readily or eventually decompose when exposed to light, water and/or bacteria or fungi, but PFAS persist in the environment an exceptionally long time leading to them being referred to as "forever chemicals." PFAS molecules involve linked carbon and fluorine atoms. Because the carbon-fluorine bond is exceptionally strong, these chemicals do not degrade easily and can persist much longer than even plastics.

Why are PFAS a concern?

Exposure to some types of PFAS have been linked to serious negative health effects. The widespread use of these chemicals paired with their resistance to natural decay means that PFAS from past and present uses are accumulating in the environment. A 2023 USGS study estimated that at least 45% of US tapwater is estimated to contain one or more PFAS chemicals (PFAS in US Tap Water). U.S. Center for Disease Control (CDC) research has shown that most people in the United States have PFAS in their blood. PFAS become incorporated into bodies through drinking water, airborne contaminants and through the food supply via plants and animals grown, raised, or processed in contaminated areas. It is also possible for PFAS to enter foods through packaging, processing, and cookware.

Are PFAS in water being regulated?

In 2020, New York established legally enforceable "Maximum Contaminant Levels" (MCLs) for two of the many thousands of PFAS (PFOA and PFOS). In April of 2024, the US EPA implemented even stricter MCLs for PFOA and PFOS as well as new restrictions for four additional PFAS. These regulations apply only to drinking water. While New York State has set "guidance values" for PFOA and PFOS in "ambient waters," there are currently no enforceable regulations pertaining to amount of PFAS allowed in water bodies that are not regulated drinking water sources nor regarding discharge of PFAS into waterbodies from common sources of concentrated PFAS such as wastewater treatment facilities and landfills.

Are PFAS found locally?

With the implementation of state and federal drinking water regulations, drinking water treatment facilities are now required to monitor for the six regulated PFAS at the facilities. Some Cornell and Ithaca College labs have been testing for a handful of additional PFAS in the wider local environment. So far, testing at drinking water treatment facilities has not shown levels above EPA-established limits. Certain PFAS *have* been detected in various streams and in Cayuga Lake with the highest concentrations being found at wastewater treatment facilities, landfills and near the Ithaca Airport.

Some Common Products that often Contain PFAS

- toilet paper
- shampoo
- dental floss
- make-up
- candy wrappers
- non-stick cookware
- fast food packaging
- yoga clothes
- waterproof clothing
- coated paper
- carpets
- fire retardant
- household cleaning products
- paints, sealants and varnishes
- stain resistance products
- pesticides

Resources

Helbling Research Group FLX Research Project
www.helbling.research.engineering.cornell.edu/flx-pfas-project/

PFAS in US Tap Water
(USGS Study)
www.sciencedirect.com/science/article/pii/S0160412023003069?via%3Dihub

PFAS in Human Blood
(CDC Research)
www.atsdr.cdc.gov/pfas/health-effects/us-population.html

Reducing PFAS in Your Drinking Water with a Home Filter
(EPA Fact Sheet)
www.epa.gov/system/files/documents/2024-04/water-filter-fact-sheet.pdf