

PFAS : What Is It?

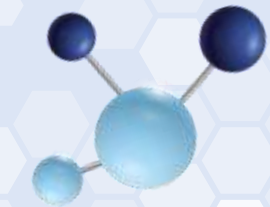
History, Toxicity, and Solutions

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(NEWMOA)

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What is NEWMOA?

- Northeast Waste Management Officials' Association
- Non-profit, non-partisan interstate association
- Solid waste, hazardous waste, waste site cleanup & pollution prevention programs
- CT, ME, MA, NH, NJ, NY, RI & VT
- Formally recognized by EPA in 1986
- www.newmoa.org



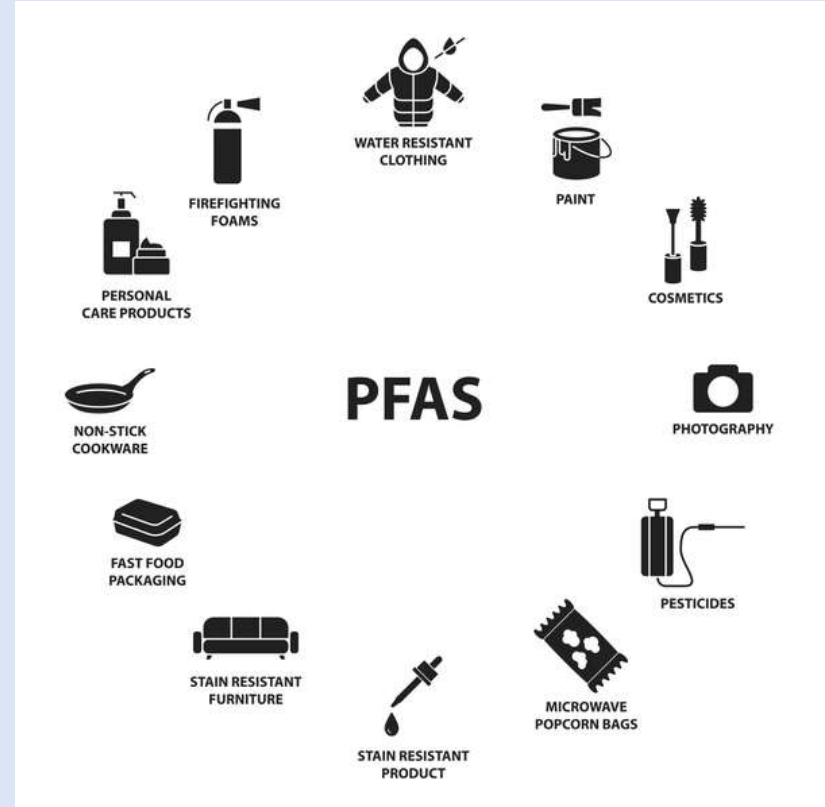


Agenda

- Outline of project with NEKWMD
 - What is PFAS & why do we care?
 - How PFAS gets into the environment
 - Information about PFAS in consumer products & ideas to reduce use
- 

USDA PFAS in Consumer Products Project

- Focused on consumer products and the impacts of PFAS on waste streams
- Purpose:
 - Help people learn about PFAS in the environment and waste streams
 - Show people how to avoid purchasing products containing PFAS





USDA PFAS in Consumer Products Project

What we've completed so far:

05

Factsheets

Covering:

- Why Care about PFAS
- Clothing & Other

Textiles

- Personal Care Products
- Outdoor Recreation
- Foodware & Packaging

06

Outreach Events

Summer 2023:

- Tabled at two farmers markets each in ME & NH

In the NEK:

- Lyndonville Farmer Market
- Recycling Center

01

Guide for Food Service

A Guide that shows what items might contain PFAS & how establishments may contribute to human exposure & contamination of the environment



Upcoming Project Activities

A Virtual Workshop for Food Service Providers

Potential webinar date is 6/25/2024 from 2:00 – 4:00 PM ET

Hands-on Technical Assistance at One School in VT

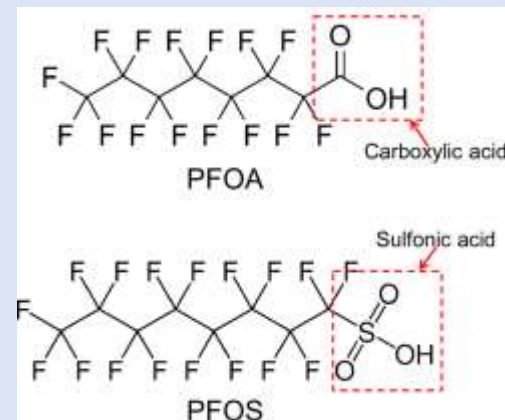
Location & date to be determined



What are PFAS?

PFAS stands for Per- and Polyfluoralkyl substances

- A group of thousands of synthetic chemicals used in hundreds of types of products
 - Water-resistant/waterproof
 - Oil/grease resistant
 - Stain resistant
 - Resistant to friction
- Known as “forever chemicals”
- Main characteristic: Fluorine attached to Carbon
 - The number of carbons determines the length of the PFAS (C6, C8, etc.) and if it is considered a long-chain or short-chain

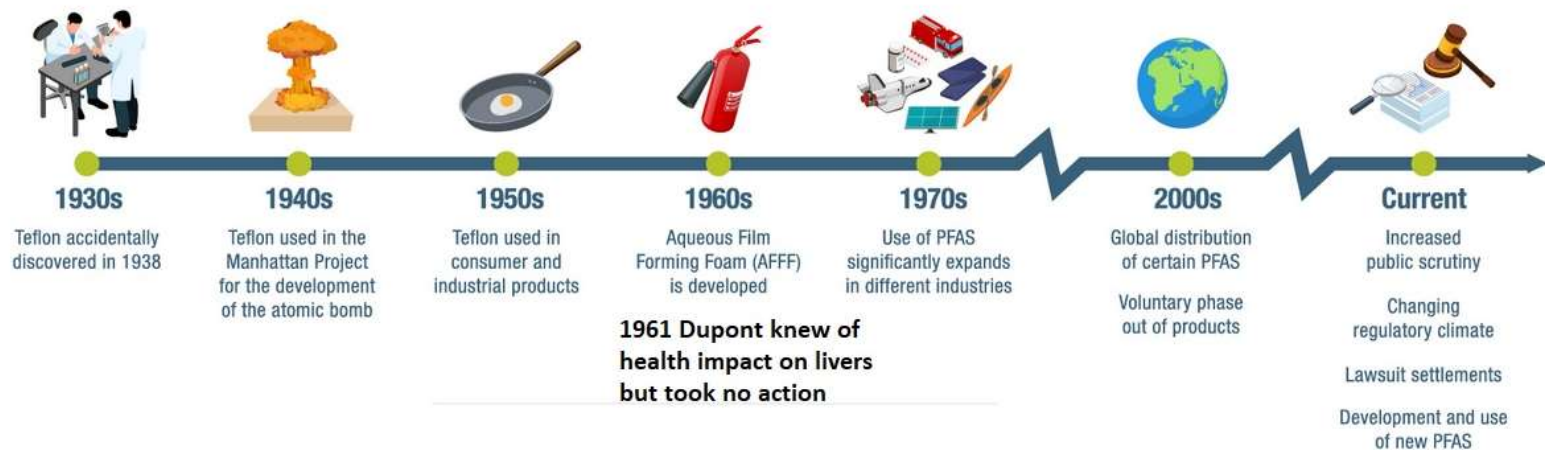


Most people think if something is for sale, that means it's safe...(but that's not true)

How did PFAS develop and evolve?

PFAS Development ...

...and Evolution





Why are PFAS so Problematic?

The carbon-fluorine bond is NOT natural	<ul style="list-style-type: none">• Created with tremendous heat and pressure• Per (fully) fluorinated PFAS do not breakdown – poly (partially) fluorinated PFAS breakdown only into the fully fluorinated portion which then doesn't change• Accumulating all over the planet & in the blood of virtually all animals & people
PFAS impact human & environmental health	PFAS impact the health of humans, animals, fish and other living beings even with exposure at relatively low levels
PFAS have polluted water supplies	Public water supplies – must test for PFAS - 17 in Vermont have exceeded current standards Private wells – can be contaminated from a variety of sources – including septic systems

PFAS were not a regulated chemical group...until recently!



PFAS Toxicity and Health Effects

PFAS are Linked to a Multiplicity of Adverse Health Effects



Reduced Immune System Function



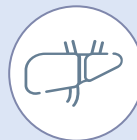
Increased Risk of Pre-eclampsia in Pregnant Women



Increased Cholesterol Levels



Increased Thyroid Disorders and Other Hormone Disruption

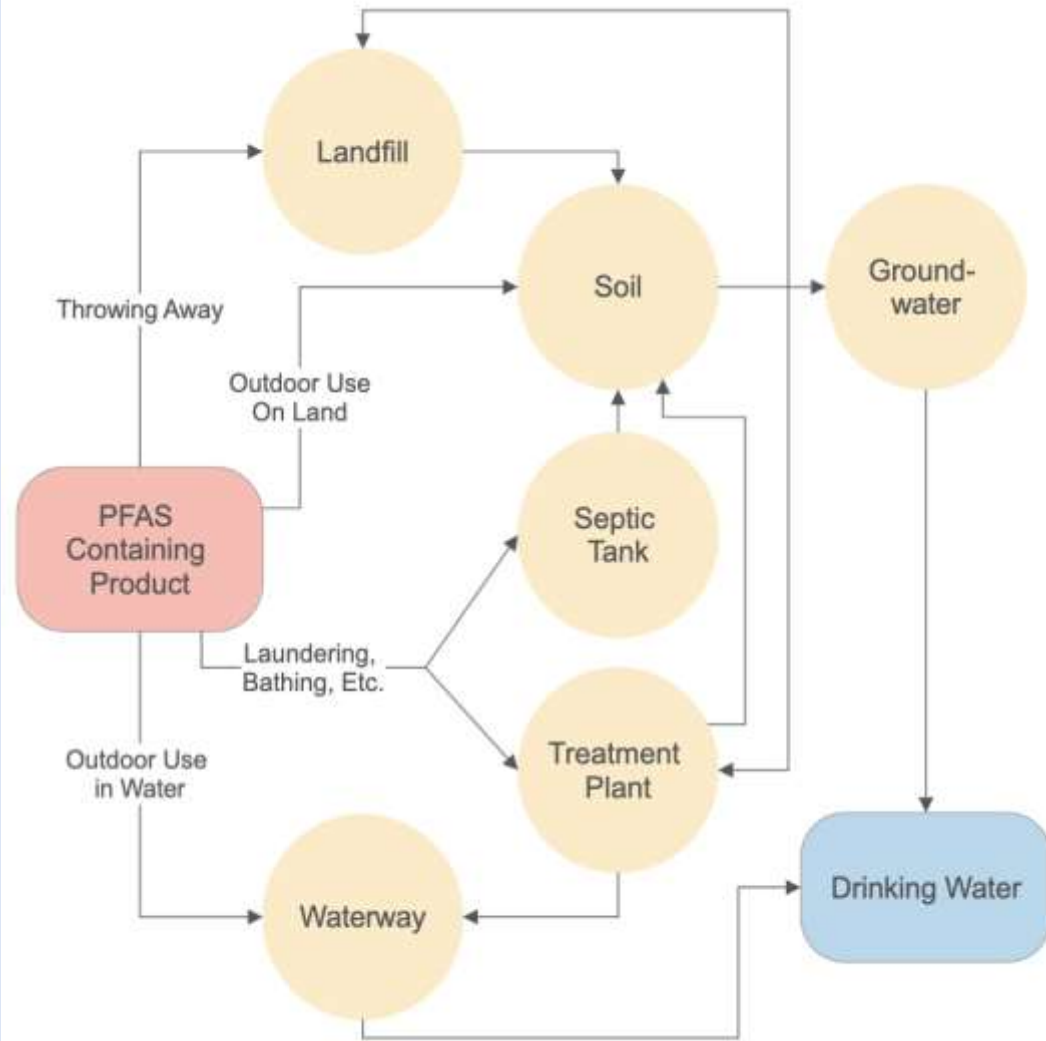


Increased Risk of Liver, Kidney, Prostate & Testicular Cancer



How PFAS in Products Might Impact the Environment

- Remember – they do NOT breakdown – they just move around
- PFAS can get into groundwater or surface water used for drinking water & lead to significant exposure
- Note: there are other sources of environmental contamination:
 - Firefighting foam
 - Manufacturer use
 - Air deposition
- BUT – studies have shown that wastewater from homes has significant amounts



What Products Often Contain PFAS?



Water-Resistant/Waterproof

Oil/Grease-Resistant

Stain-Resistant/Stain-proof/Stain Release



Overview Factsheet: Why Should I Care?

Key Takeaways:

- Factsheet addresses exposure, health effects and potential environmental impact
- Children can experience heightened exposure to PFAS due to hand to mouth ingestion and close contact with carpeting/rugs causing inhalation of PFAS-containing dusts

What You Can Do:

- Check labels, read ingredients, and be aware that PFAS are considered proprietary ingredients and manufacturers often do not disclose their use

What are PFAS & Why Should I Care?

Per- and Polyfluoroalkyl Substances (PFAS) are a large group of human-made chemicals known for their heat-stable, frost-resistant, and water-, grease-, and stain-resistant properties. PFAS have been added to many industrial and consumer products since the 1940s and there are thousands of different PFAS chemicals in use today. PFAS move easily in the environment and can be found in our water, food, soil, and air, often far away from where they were made or used by industry. PFAS are frequently called "forever chemicals" because they do not break down and build up over time in the environment, animals, and people.

There are many sources of PFAS in the environment. **This fact sheet focuses on use and disposal of PFAS-containing Consumer Products.** Understanding which products are likely to contain PFAS and how to avoid/limit them, helps reduce your personal exposure and decreases the amount of PFAS entering the environment and drinking water supplies.

What Are the Health Effects?

Scientists have found exposure to PFAS can cause many effects, including:

- Reduced immune system function
- Increased cholesterol levels
- Increased risk of pre-eclampsia in pregnant women
- Increased thyroid disorders and other hormonal disruption
- Increased risk of liver, kidney, prostate, and testicular cancer

How Are People Exposed to PFAS?

A recent study* conducted by the U.S. Centers for Disease Control and Prevention (CDC) found that most people have PFAS in their body:

- The main exposure routes are ingestion of food and water and inhalation of dust that contain PFAS
- PFAS can be harmful to human health, particularly if someone is exposed to high levels for an extended period of time
- PFAS are normally absorbed by skin so tanning salons or water containing PFAS does not present a significant risk
- The potential health impact from the application of PFAS-containing personal care products on the skin is unclear and further research is required

*NORMAN is an Equal Opportunity Provider and Employer

***Want to limit PFAS exposure?
Reduce the number of PFAS-containing products you purchase!***

Four Product Category Factsheets



PFAS in Clothing & Other Textiles:

What you should know:

Per- and Polyfluoroalkyl Substances (PFAS) are a group of human-made chemicals that build up over time in the environment, animals, and humans, and can be harmful to health. Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce your personal exposure and decreases the amount of PFAS entering the environment and ending in our supplies. For an introduction to PFAS, read the What are PFAS & Why Should I Care? factsheet.

Many fabrics are treated with PFAS to achieve durability and water- and stain-resistant qualities. You typically need to clean or wash surface-level stains with PFAS. Examples of fabrics that might contain PFAS include:

- Coating
- Shielding
- Waterproof
- Water- & stain-resistant
- Lightweight fabrics
- Bag & carrying

Health Risks

In general, items making the following claims are likely to contain PFAS:

- Waterproof, water-resistant or stain-resistant
- Waterproof, stain-resistant or stain shields

When PFAS-containing clothing and other textiles are washed, some of the PFAS comes off and into the wash water that is discharged from your home. If you have a septic system, the wastewater is discharged before ground where it can contaminate the groundwater. If your home is on a sewer system, the wastewater plant cannot remove PFAS until it enters the environment.

Additional Concerns for Children

- PFAS is reported to affect fetal and infant development in animal studies. There are no increased reports for children in the U.S. who are close to the largest source of PFAS in their home (their mother's breast milk).
- Cleaning or washing may lead to higher exposure for children if they play with PFAS-treated surfaces in their mouth.

Notes of Interest

- PFAS-free garments and accessories are available.
- Washing PFAS-treated clothes in hot water can break down PFAS and reduce its effectiveness.

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PFAS in Foodware & Packaging:

What you should know:

Per- and Polyfluoroalkyl Substances (PFAS) are a group of human-made chemicals that build up over time in the environment, animals, and humans, and can be harmful to health. Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce your personal exposure and decreases the amount of PFAS entering the environment and ending in our supplies. For an introduction to PFAS, read the What are PFAS & Why Should I Care? factsheet.

Many foodware and food packaging are treated with PFAS to achieve water- and stain-resistant qualities. Examples of packaging and foodware that may contain PFAS include:

- Reusable containers
- Paper plates & disposable containers
- Coated food packaging
- Bakery bags
- Flour liners & release coatings

When PFAS-containing foodware and packaging are used, some PFAS can transfer to food leading to direct consumption of PFAS. Note that higher temperatures and longer durations of time can lead to greater amounts of PFAS in food. Once PFAS-treated products are heated, they enter a harmful endocrine pathway for PFAS to enter the bloodstream. When PFAS-containing paper and fiber products are composted, PFAS remains in the compost and enters the environment when it is used.

Notes of Interest

- In general, items making the following claims are likely to contain PFAS:
 - Oil-free, grease- and stain-resistant
 - Reusable containers that cannot be heated above a certain temperature

Health Risks

Foodware and packaging primarily contribute to human exposure to PFAS from:

- Direct consumption of food containing PFAS from foodware and packaging
- Drinking water that is impacted from leaching or leachate from PFAS-containing food packaging

Many personal care products are treated with PFAS to achieve water- and stain-resistant qualities. Examples of outdoor recreation products that might contain PFAS include:

- Wetsuits
- Boats, shoes & gear
- Waterproof gear
- Stickers, tape, and other outdoor clothing
- Stickers, tape, and other outdoor gear
- Tents
- Backpacks

Notes of Interest

- Waterproofing protection sprays

When PFAS-containing outdoor products are used, some of the PFAS can be washed off into the environment, polluting the soil and water. When gear is stored at home, some of the PFAS can end up in the water vapor (leached from your tent). If you have a septic system, the wastewater is discharged before ground where it can contaminate the groundwater. If your home is on a sewer system, the wastewater plant cannot remove PFAS until it enters the environment.

Notes of Interest

- Some outdoor products can have their components heated to high temperatures or exposed to water. Although PFAS (perfluoropolyether) and some PFAS (polytetrafluoroethylene) are not used to produce outdoor products, when stretched or used at high temperatures, reusable supplies can break down and release PFAS into food, water, and the air.

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PFAS in Outdoor Recreation:

What you should know:

Per- and Polyfluoroalkyl Substances (PFAS) are a group of human-made chemicals that build up over time in the environment, animals, and humans, and can be harmful to health. Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce your personal exposure and decreases the amount of PFAS entering the environment and ending in our supplies. For an introduction to PFAS, read the What are PFAS & Why Should I Care? factsheet.

Outdoor recreation products primarily contribute to human exposure to PFAS from:

- Drinking water that is impacted from runoff and leachate containing PFAS
- Using gear and gear that PFAS pollute the environment
- Washing in and carrying gear from boats, tents, and protection gear

Many personal care products are treated with PFAS to achieve water- and stain-resistant qualities. Examples of outdoor recreation products that might contain PFAS include:

- Wetsuits
- Boats, shoes & gear
- Waterproof gear
- Stickers, tape, and other outdoor clothing
- Stickers, tape, and other outdoor gear
- Tents
- Backpacks

Notes of Interest

- Waterproofing protection sprays

When PFAS-containing outdoor products are used, some of the PFAS can be washed off into the environment, polluting the soil and water. When gear is stored at home, some of the PFAS can end up in the water vapor (leached from your tent). If you have a septic system, the wastewater is discharged before ground where it can contaminate the groundwater. If your home is on a sewer system, the wastewater plant cannot remove PFAS until it enters the environment.

Notes of Interest

- Some outdoor products can have their components heated to high temperatures or exposed to water. Although PFAS (perfluoropolyether) and some PFAS (polytetrafluoroethylene) are not used to produce outdoor products, when stretched or used at high temperatures, reusable supplies can break down and release PFAS into food, water, and the air.

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PFAS in Personal Care Products:

What you should know:

Per- and Polyfluoroalkyl Substances (PFAS) are a group of human-made chemicals that build up over time in the environment, animals, and humans, and can be harmful to health. Understanding which products are likely to contain PFAS and how to avoid buying them helps reduce your personal exposure and decreases the amount of PFAS entering the environment and ending in our supplies. For an introduction to PFAS, read the What are PFAS & Why Should I Care? factsheet.

Many personal care products include PFAS to achieve durability and water-resistant qualities. Products that might contain PFAS include:

- Cosmetics
- Shampoos & body lotion
- Dental floss
- Hair polish
- Hair care products
- Deodorants & shaving cream

Notes of Interest

In general, items making the following claims are likely to contain PFAS:

- Waterproof, water-resistant or stain-resistant
- Long-lasting protection with moisture, oil, protein, and sunscreen

Personal care products can lead to direct consumption of PFAS when used in and around the mouth. When PFAS-containing cosmetics and other personal care products are used, they get washed down the drain and get product residue in a sink or bathtub. The hair and scalp of public health found 70% of waterproof makeup, 40% of moisturizers and liquid lipsticks and more than 50% of nail and hair products that tested and contained at least low PFAS.

Notes of Interest

- Some types of cosmetics contain PFAS including foundation, mascara, lip products, sunscreen, and eye products. PFAS are added to increase durability and waterproof, achieve waterproof qualities, and change product texture. It is difficult to distinguish the hair and scalp of public health found 70% of waterproof makeup, 40% of moisturizers and liquid lipsticks and more than 50% of nail and hair products that tested and contained at least low PFAS.

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All factsheets can be found at www.newmoa.org/projects/pfas-in-consumer-products/






Be Skeptical!

PFAS-Free Claims

Some companies state that their products are PFC-free, PFOA-free and/or PFOS-free, but such statements only cover some specific PFAS chemicals and they are likely still using different PFAS in their products. Even if a website states a product is PFAS-free that doesn't mean it is!

Green Messaging

Many molded fiber and recycled paper disposable tableware are being advertised as “compostable” but are treated with chemicals such as PFAS to achieve water-, and grease-resistant properties. PFAS can be mixed into the paper pulp during manufacturing and be present without an obvious physical coating.





Clothing & Textiles

Key Takeaways:

- Many fabrics are treated with PFAS to achieve durability and water- and stain-resistant qualities
- Examples of textiles that may include PFAS:
 - Clothing, Bedding, Tablecloths, Window & Shower Curtains, Upholstered Furniture, Rugs & Carpeting
- Textiles primarily contribute to human exposure from:
 - Drinking water
 - **Dusts**

What Can You Do?

- Don't buy textiles labeled as waterproof or water/stain/oil-resistant
- Look for untreated natural fabrics like cotton, linen, wool, hemp and silk
- Consider wood or tile flooring instead of carpet or opt-for carpet without water/stain/oil-resistant properties
- Try spot treating with plain soap rather than cleaning the full item

Since PFAS wash out over time, continue using products that have been laundered rather than purchasing new!



Foodware and Packaging

Key Takeaways:

- Many coated in PFAS to achieve water/oil/grease-resistance
- Examples that many contain PFAS include:
 - Nonstick Cookware, Paper Plate & Disposable Tableware, Coated Food Packaging, Bakery Bags, Pizza Boxes & Takeaway Containers
- Primarily contribute to human exposure from:
 - Direct consumption
 - Vapors from overheated cookware
 - Drinking water

What You Can Do:

- Choose cookware without a nonstick coating
- **Use reusable containers**
- If disposable is required, choose uncoated or wax-coated and products that DO NOT advertise oil/grease/water-resistant
- Only compost food waste – do not compost any containers or packaging that may contain PFAS

Nonstick cookware cannot be heated above a certain temperature!



Outdoor Recreation

Key Takeaways:

- Examples that many contain PFAS include:
 - Bike Lubricants, Boots/Shoes & Care Products, Rain Gear & Other Outdoor Clothing, Ski/Boat/Surfboard/Hockey Wax, Tents, Backpacks, Waterproofing & Protectant Sprays
- Primarily contribute to human exposure from:
 - Direct consumption from game and fish
 - Drinking water
 - Breathing in textiles, wax and protectant spray vapors, aerosols & dusts

What You Can Do:

- Use PFAS-free waxes
- Limit washing of Durable Water Repellent products
- Try spot cleaning with soap and water to minimize PFAS release
- If you must use PFAS-waterproofing products, use a rub-on product rather than aerosol
- Use PFAS-free boot & shoe care products

PFAS can be found in fish and game. Please check local 'Do Not Eat' advisories before consumption. Many bodies of water, fish, and game have not yet been tested!!



Personal Care Products

Key Takeaways:

- Long-lasting cosmetics are likely to contain PFAS – ex: sunscreen, mascara
- Examples that many contain PFAS include:
 - Cosmetics, Sunscreen & Body Lotion, Dental Floss, Nail Polish, Hair Care Products, and Cleansers & Shaving Cream
- Primarily contribute to human exposure from:
 - **Direct consumption from placing products in and near mouth**
 - Washed off our bodies & into wastewater – can affect drinking water

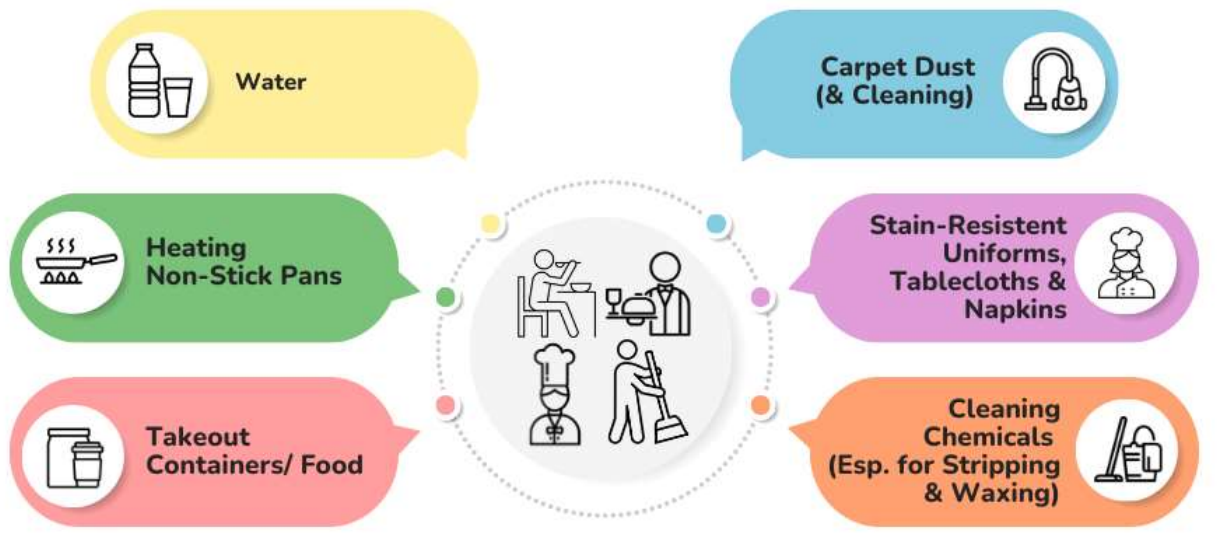
What You Can Do:

- Choose sunscreens and cosmetics without PFAS
- Avoid waterproof and water-resistant cosmetics
- Choose PFAS-free floss such as uncoated natural fiber floss
- Consider pressurized water flossing to limit chance of PFAS exposure and reduce single-use waste

Two PFAS formulations commonly found in sunscreens are “PAP” (polyfluoroalkyl phosphate esters) and “PTFE” (polytetrafluoroethylene) . Read the ingredients on the label to avoid PFAS!

PFAS in Food Service: Potential Exposure

POTENTIAL PFAS SOURCES FROM FOOD SERVICE



Understanding which products likely contain PFAS and how to avoid purchasing them helps reduce worker and consumer exposure and decrease the amount of PFAS in the environment!



PFAS in Floor Stripping, Washing & Waxing

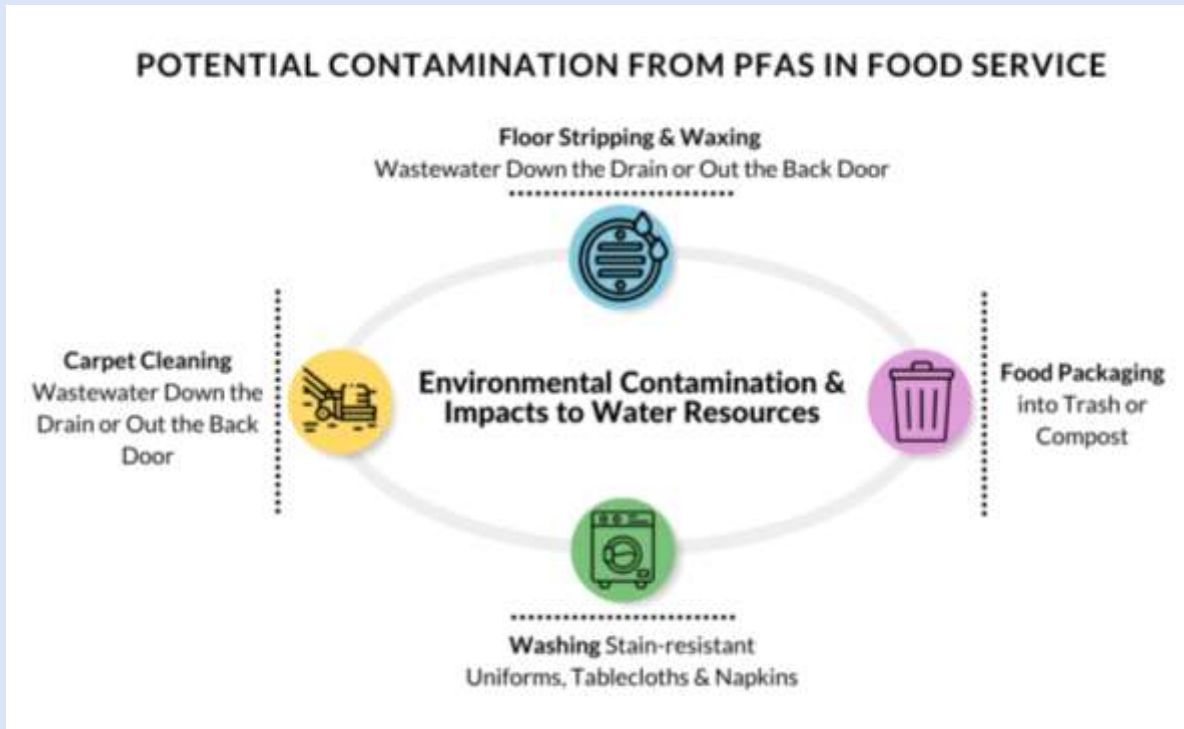
A Study from NH DES in Schools

- PFAS found at high levels in wastewater from floor stripping at all four schools
- PFAS lower but still significant levels in the wastewater generated from routine floor cleaning
- Floor strippers and finishes found to contain high levels of PFAS
- Disposal of wastewater from floor stripping and finishing are likely to have contributed to the contamination of groundwater that the schools use for drinking water

What You Can Do:

- Avoid floor cleaning – dry sweep as much as feasible
- To the extent feasible, clean floors with plain water
- Make sure the floor stripping, finishing, and cleaning product used do not contain PFAS (**Avoid products with “fluoro” in the ingredients**)
- Do not dispose of the wastewater from floor stripping or refinishing down the drain or out the back door

PFAS in Food Service: Potential Contamination



Wastewater and trash containing PFAS can lead to potential environmental contamination that impacts water resources. Choose PFAS-free cleaning methods and reduce use of PFAS products!

Thank you!

Any questions?

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