Purchasing Safer Compostable Food Service Ware

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Webinar Questions

- Post your question to the Questions Panel in your Control Panel

- Presentation and recording will be available at cleanproduction.org

Speakers

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Founder & Principal, Environmental & Public Health Consulting

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Hazards of PFAS

A FACT SHEET

Summary[1]

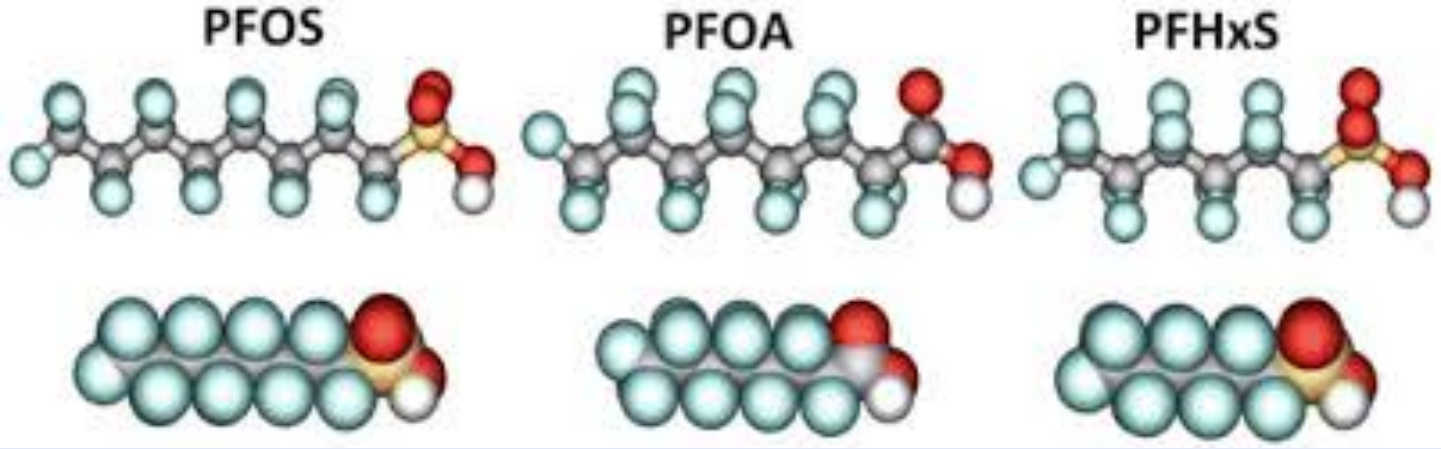
PFAS is an acronym (**P**er- and Poly**f**luoro**a**lkyl **S**ubstances) for a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom. The class includes more than 3,000 chemicals, although fewer are currently on the global market. PFAS vary in the number of carbon atoms forming the backbone of their molecule, from a chain of two carbons to large molecular weight polymers.[2]

PFAS are commonly used to manufacture non-stick, grease and stain-resistant coatings in a variety of industrial and consumer products, including food packaging, non-stick cookware, carpets and upholstery, ski wax, floor wax, outdoor gear, dental floss and firefighting foams.

The best-known PFAS chemicals are PFOA and PFOS, each with a chain of eight carbon atoms. These so-called *long-chain* PFASs have been voluntarily phased out in the United States, Europe and Japan. Many long-chain PFAS are now being replaced in multiple applications with chemicals with fewer fluorinated carbon atoms, often referred to as *short-chain* PFAS. The PFAS chemical family, and new generation PFAS being substituted for the phased out PFAS, however, include many other fluorinated compounds with different structures (see Figure 1).

What Are PFAS?

- PFAS = **P**er- and Poly**f**luoro**a**lkyl **S**ubstances
- Class of over 3,000 fluorinated organic chemicals containing at least one fully fluorinated carbon atom



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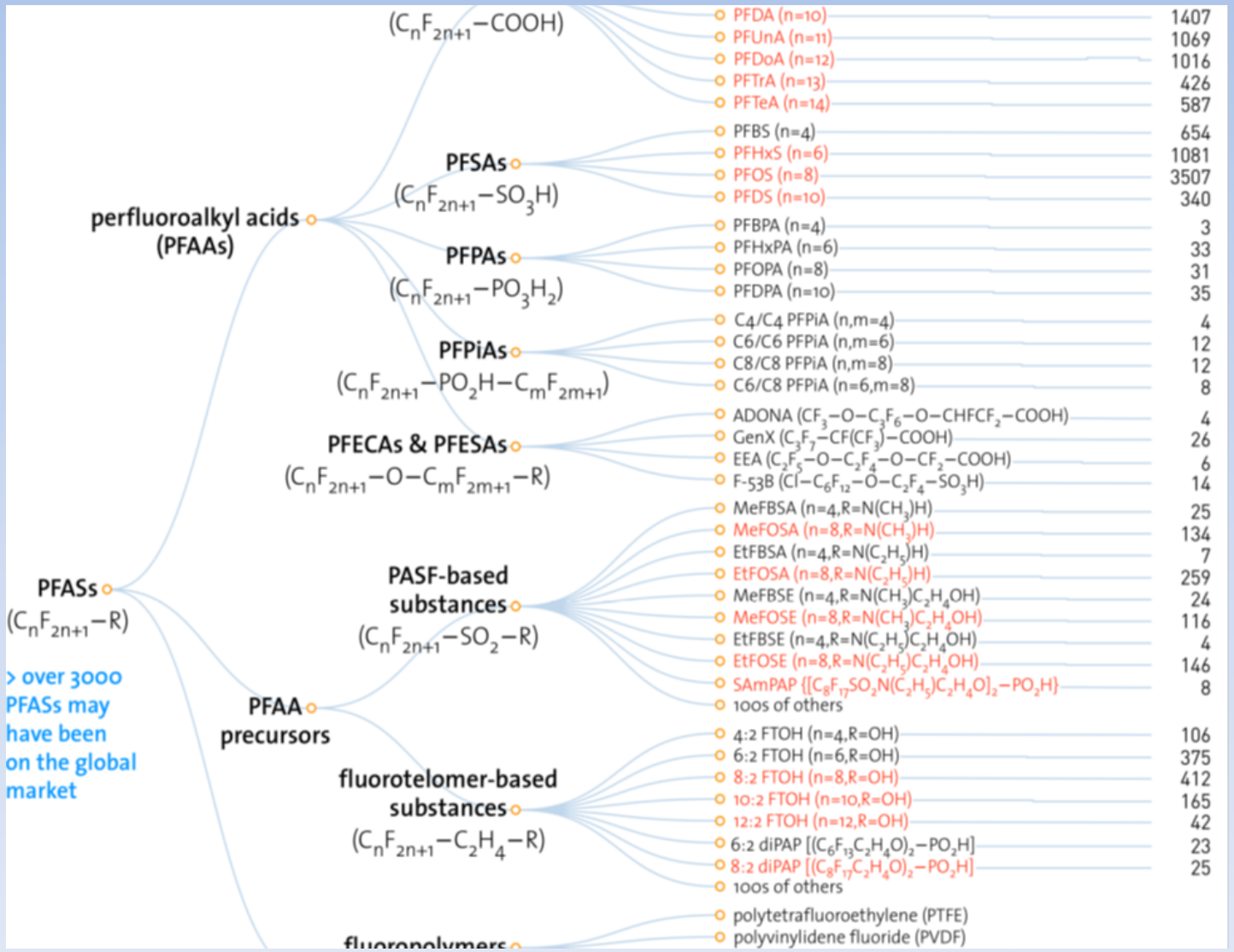

Wang, et al. A Never-Ending Story of Per- and Polyfluoroalkyl Substances (PFASs)? Environ. Sci. Technol. 2017, 51, 2508−2518; DOI: 10.1021/acs.est.6b04806

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PFAS: Widespread Use Across Sectors

- Carpets & Upholstery
- Waterproof apparel
- Waxes (e.g., floors, skis)
- Non-stick cookware
- Oil and grease resistant food packaging
- Personal care products (e.g., dental floss)
- Paints
- Polymers
- Fire fighting foams

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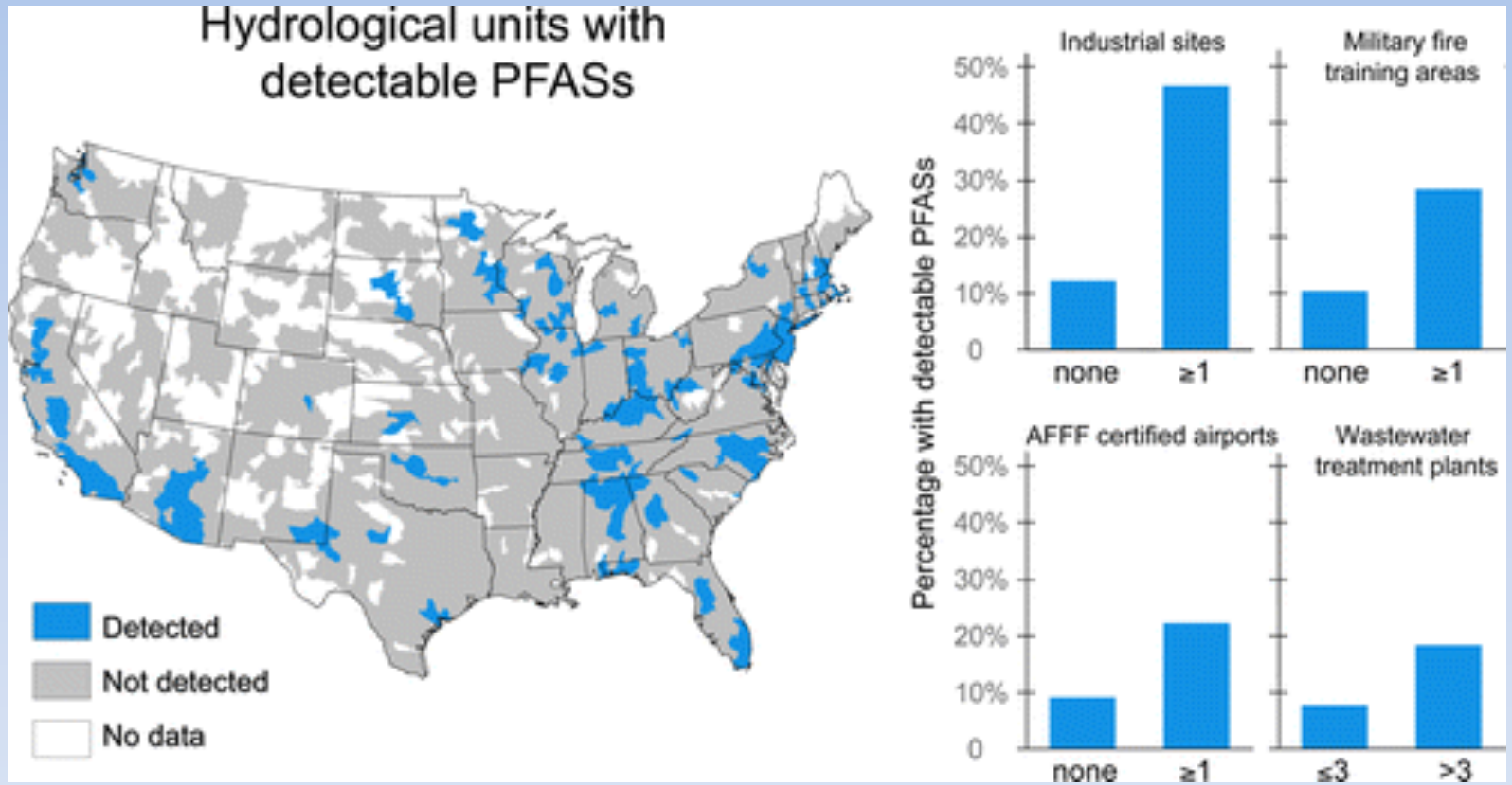

Drinking Water Contamination

Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants

Xindi C. Hu et al., *Environ. Sci. Technol. Lett.*, **2016**, *3* (10), pp 344–350

DOI: 10.1021/acs.estlett.6b00260

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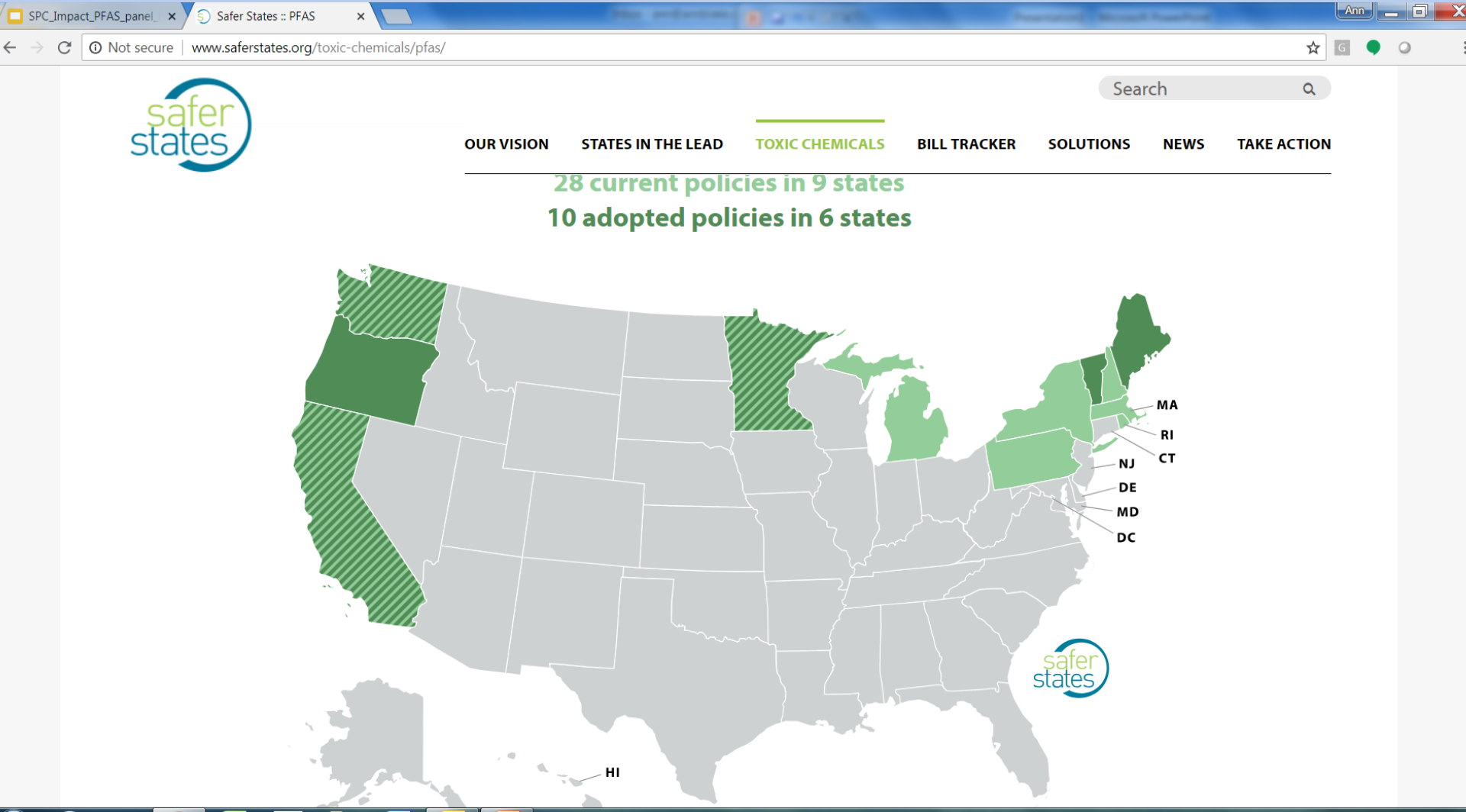
Focus of Regulatory Activity

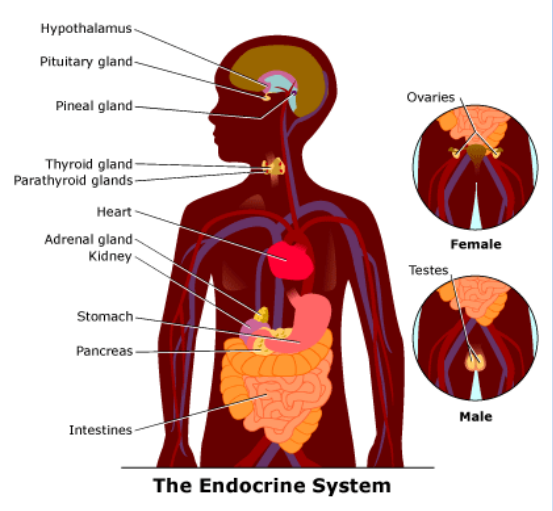


Regulatory Activity

- Washington State **HB2658 / SB6396**: Adopted 2018
  - Prohibits the manufacture and sale of food packaging containing PFAS and requires the Dept. of Ecology to conduct an assessment on safer alternatives by 2020
- Washington State restriction on PFAS-containing fire-fighting foam from July 1, 2018
- California Safer Consumer Products Program
  - PFAS in carpets and textiles proposed as product-chemical combination for focus in 2018-2020
- European Union:
  - Ongoing monitoring of PFAS in food
  - February 2018 revised drinking water standards for PFAS as a class

Exposures & Impacts

- Health impacts
  - PFOA: Kidney, testicular cancer
- Other health effects:
  - hormone disruption, immune system effects
    - e.g., decreased response to vaccines in children
  - high cholesterol, thyroid disease, hypertension
  - lowered sex and growth hormones in children
  - altered mammary gland development



- Key exposure routes
  - direct contact or inhalation, food, consumer products, house dust, contaminated drinking water, eating fish and shellfish, or through workplace exposures
  - Potential for high aggregate exposure from multiple sources due to wide use
- Current focus on food contact materials because of direct exposure pathways

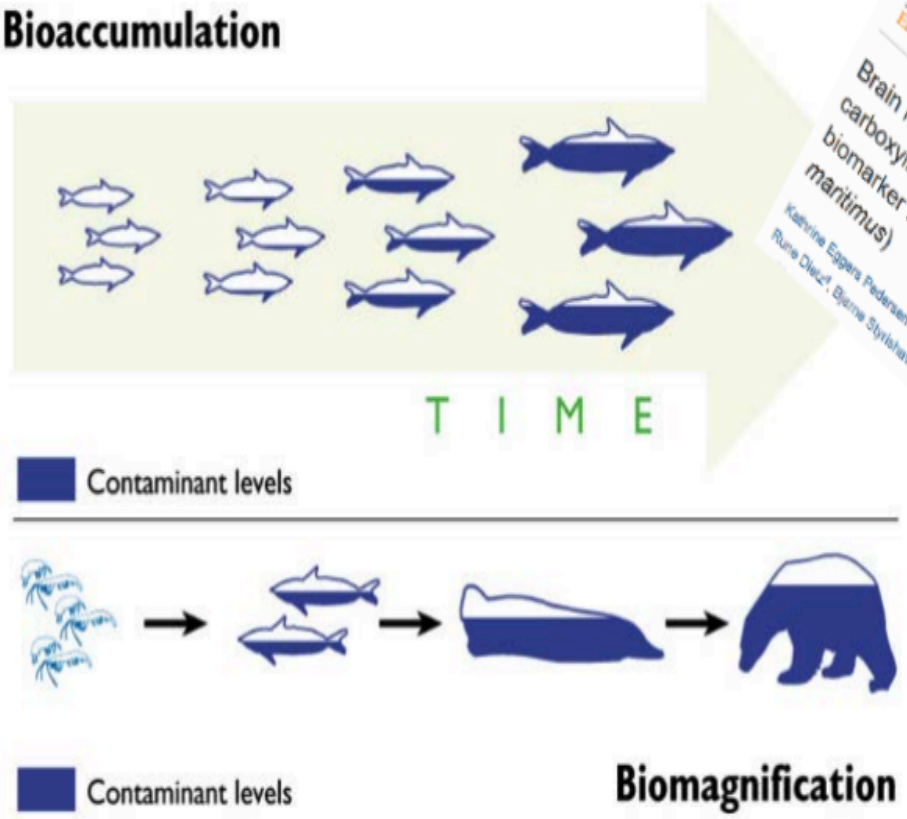
ENVIRONMENTAL PERSISTENCE
BIOACCUMULATION
UBIQUITY

Industrial release

Flame retardant release

Surfactant release

Slide courtesy of Dr. Graham Peaslee



Polar bears: ~88 ppb PFOA

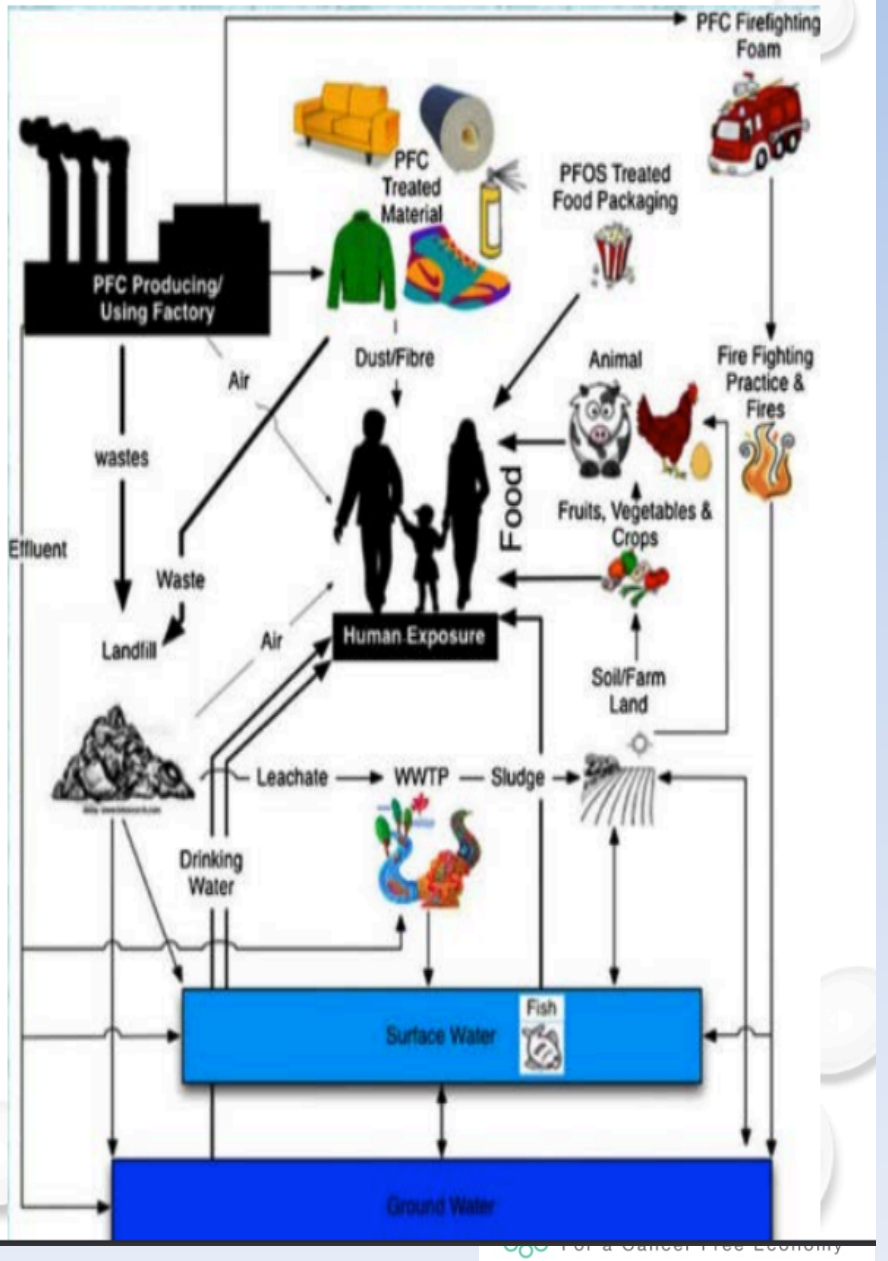
Humans (North America): ~ 5 ppb PFOA

Slide courtesy of Dr. Graham Peaslee

ENVIRONMENTAL PERSISTENCE

Routes of Exposure from Food Service Ware

- Ingestion and direct contact with food packaging
- Landfill leachate
- Composting of food service ware



Slide courtesy of Dr. Graham Peaslee

Oliaei F, et al., Environ Sci Pollut Res Int. 2013, 1977-92.

Molded Fiber Products

Bowls

Clamshells

Plates

Coated Paper/Paperboard Products

Food trays, boats, scoops

Pizza boxes

Bags, wrappers, food liners, sandwich bags

Take-Out Containers

Food Contact Materials

Silent Spring Institute

University of Notre Dame / Hope College

Green Science Policy Institute

Environmental Working Group

U.S. EPA National Exposure Research Laboratory

CA Dept. of Toxic Substances Control

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Over 400 samples tested for total fluorine with PIGE

27 fast food chains

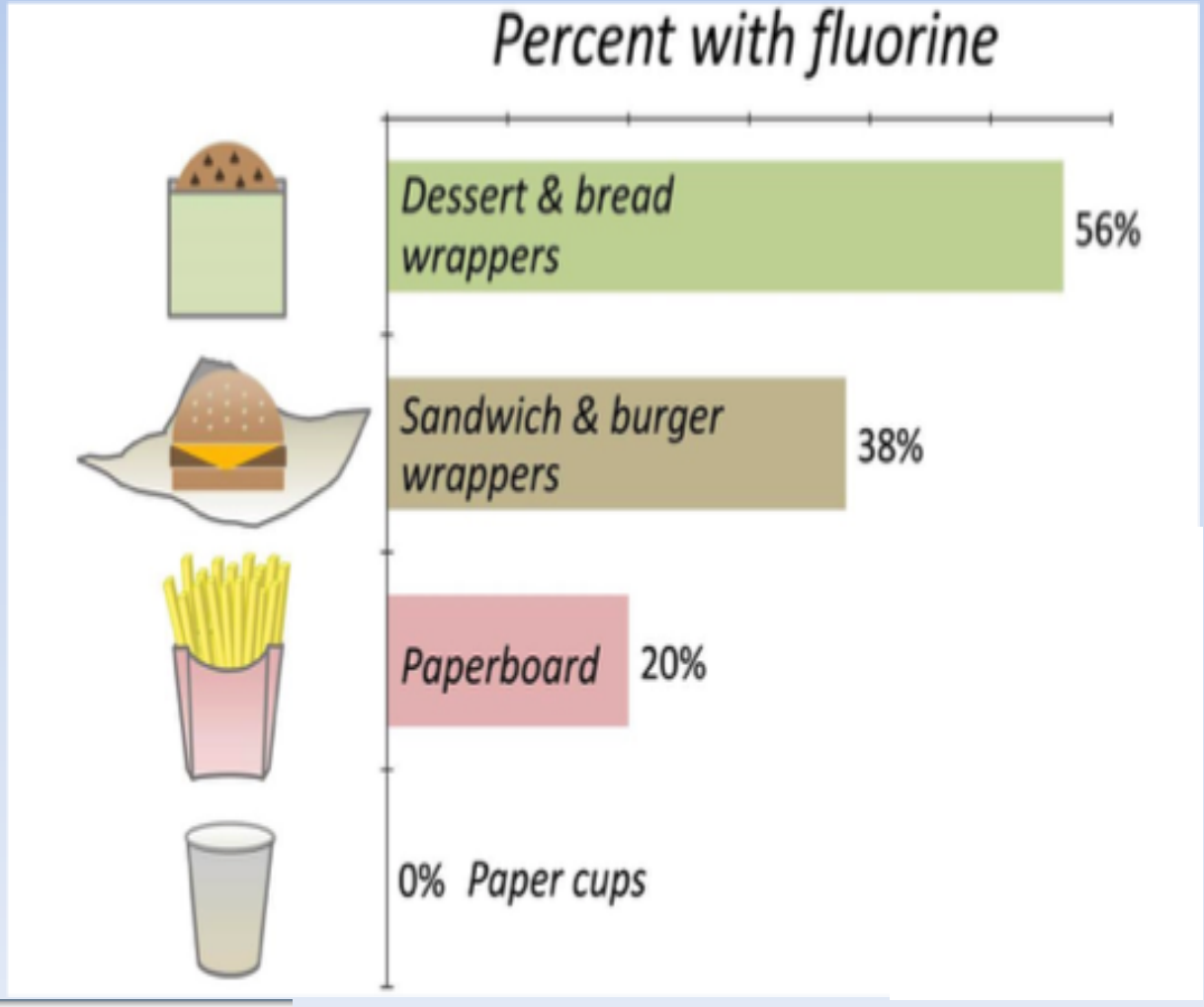
Paperboard

Paper wrappers

Paper cups

Schaider *et al.* 2017. *ES&T Letters.*

Paper wrappers most likely to contain fluorine



Schaider *et al*. 2017. *ES&T Letters*. 4(3):105–111.

SILENT SPRING INSTITUTE
Researching the Environment and Women's Health

Collaborative Network
For a Cancer Free Economy

Avoiding Hidden Hazards

A Purchaser's Guide to Safer Foodware

Table 1: Fluorine (F) Test Results by Product Type

Product Type	No/Low F	F	#Tested
Plates	26	32	58
Bowls/Soup Containers	24	23	47
Clamshells	4	17	21
Trays	0	7	7
Food Boats	4	0	4
Total Tested	58	79	137

CEH CENTER for ENVIRONMENTAL HEALTH

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Lab Results	Manufacturer or Brand	Type of Product	Product Number/ SKU #	Product Description (link to photo)	Product Material Type	BPI Certified?
No F	**Vegware**	Soup Container	SC-08	White 8 oz Soup Container	PLA Coated Board	Yes
No F	**Walgreen's**	Bowl	285821	Nice Extra Strong 20 oz Paper Bowl	Paper (Unknown Coating)	No
No F	**World Centric**	Soup Container	BO-PA-8	White 8 oz Soup Bowl	PLA Coated Paperboard	Yes
Low F	**Eco-Products**	Soup Container	EP-BSC8-WA	Brown 8 oz Soup Container	Made from "100% Renewable Resources," PLA Lined	Yes
Low F	**Eco-Products**	Soup Container	EP-BSC8-WA	Brown 8 oz Soup Container	PLA Coated Paperboard	Yes
Low F	**Karat Earth**	Soup Container	KE-KDP8	White 8oz Eco Friendly Paper food Container Generic	PLA Coated Paperboard	Yes
Low F	**Solo**	Soup Container	Unknown	White and Blue Biodegradable Soup Container	Paper Lined with HDPE	No
Low F	**World Centric**	Soup Container	BO-PA-12	White 12 oz Paper Hot Soup Bowl	PLA Coated Paperboard	Yes
F	**Bare by Solo**	Bowl	12BSC-2050	White 12 oz Square Bowl	Sugarcane	Yes
F	**Be Green Packaging**	Bowl	BG-B032	Brown 32 oz Bowl	Blend of Plant Fibers	Yes
F	**Be Green Packaging**	Bowl	BG-0B-321	Brown 32 oz Oval Bowl	Blend of Plant Fibers	Yes

Foodware Database | Legend | Plates | **Bowls** | Clamshells | Trays_Boats | +

New York's Green Purchasing and Agency Sustainability Program

- Amended specifications to prohibit containers and packaging with intentionally added PFAS

- Established a clear hierarchy of preferable options

  - Reusable
  - Certified compostable without PFAS
  - Recyclable without polystyrene (PET and PP preferred)
  - Recycled content or sustainably harvested renewable content

"… certified, commercially compostable materials that do not contain PFCs should be used."

2015 compostable food ware contract required products free of perfluorinated grease barriers

Amended contract language

Per- and polyfluoroalkyl substances (PFAS) must not be added to products. To comply with this requirement, Contract Vendor must submit test results demonstrating that each proposed fiber-based product contains less than 100 ppm of fluorine. Information on testing protocol and recommended labs is available, upon request.

MINNESOTA POLLUTION CONTROL AGENCY

Responding to PFAS in single use food ware

Food and food-soiled paper to green bin

San Francisco, CA

Compost

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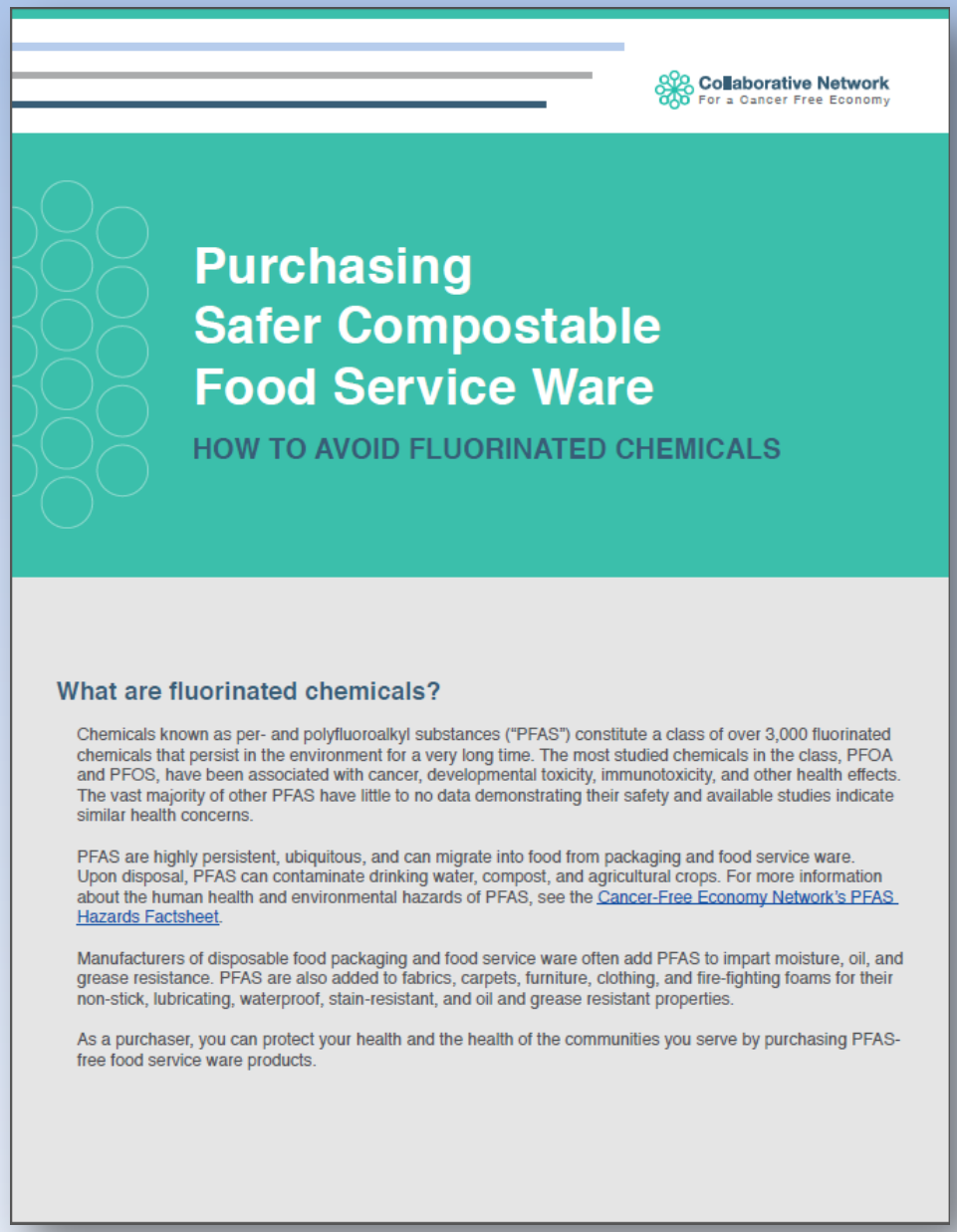
What's SF doing?

Tested foodware in City-owned hospital cafeterias

Short-chain PFAS here?

Successful procurement contract

No PFAS



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Scope

bowls

take-out and soup containers

plates

clamshells

food trays, boats, and scoops

deli and portion cups

boxes, such as for pizza and pastries

Bags, wrappers, bakery liners such as muffin papers and sandwich bags

Solutions – Other materials

Palm Leaf

Bamboo

PLA

Solutions – Machine finished

Also called:

- Mechanical densification
- Mechanically glazed
- Natural greaseproof paper
- Uncoated grease resistant

How it works:

- Refining of the fibers to make a dense structure
- Dense structure lowers air permeability and increases grease resistance.

Solutions – Coated Paper

PLA coated paper

Clay coated paper

CLONDALKIN
a group with focus

ECOWAX®

Bio-wax coated paper

Solutions – Coated Paper

Unknown Coatings

Soak-proof,
cut resistant,
microwave safe

WestRock

EnShield® Paperboard

Proprietary Coatings

Oil and grease resistant,
No LDPE,
No fluoro-carbons

PFAS-free Products

MATERIAL CATEGORY	BOWLS	TAKE-OUT & SOUP COUNTAINERS	PLATES	CLAMSHELLS	TRAYS, BOATS, & SCOOPS	DELI & PORTION CUPS	BAGS, WRAPPERS & LINERS
PLA (biodegradable plastic)	GrowPlastics		GrowPlastics	Green Safe Products, World Centric, Eco-Products	GrowPlastics	World Centric, Eco-Products, GrowPlastics	
Bamboo	Bambu		Bambu				
Palm Leaf	Resposable, Leafware by BioMass Packaging		Resposable, Leafware by BioMass Packaging				

Excerpt of table in Purchasing Guide

PFAS-free Coatings

Brand & Link to Info	Manufacturer	Solution	Applications
Earthchoice®	Domtar	Uncoated Grease Resistant Paper	Food Packaging Papers are ideal for: Baking Cup Stock Char-Resistant Papers Grease-Resistant Papers Laminating Base (Foil & Polyextrusion) Market/Steak Interleaving Paper Specialty Bag Stick Papers Twisting/Confectionery Wrappers Waxing Base
EcoARMOUR	Bercen	Polymer Coating	Food Packaging
Ecowax®	Clondakin Group	Bio-wax Coating	Coating from vegetable sources such as maize, rapeseed, and other high oil content plants
Enshield®	West Rock	Proprietary Treatment	Best used with: Foodservice Takeout Packaging Bakery Frozen Foods

Excerpt of table in supplemental resource

Drivers: WA State Legislation

Washington becomes first state to ban nonstick chemicals in food packaging

by Anna Giaritelli | April 10, 2018 12:00 AM

Democratic Gov. Jay Inslee in March signed a bill into law that will phase out perfluoroalkyl and polyfluoroalkyl substances, or PFAs, in food packaging such as popcorn bags and burger wrappers. (AP photo)

Effective January 1, 2022

Drivers: Composting Standards

BIODEGRADABLE PRODUCTS INSTITUTE

100 ppm limit on PFAS in certified products
Effective January 1, 2020

Drivers: Public Concern

EcoWatch

By Environmental Working Group
Jun. 19, 2018 11:59AM EST

These Toxic Chemicals in Food Packaging Are C Meals

By Rachel Smilan-Goldstein

On a busy weeknight, takeout and fast food are easy dinner time solutions. But y meal may come with a side of toxic fluorinated chemicals.

CBS NEWS

By DENNIS THOMPSON / HEALTHDAY / *February 1, 2017, 12:43 PM*

Are there toxins in your fast food packaging?

LISOVSKAYA NATALIA, GETTY IMAGES/ISTOCKPHOTO

Share / Tweet / Reddit / Flipboard / Email

Many grease-resistant fast-food wrappers and boxes contain potentially harmful chemicals that can leach into food, a new study contends.

Challenges: Molded Fiber

sugarcane bagasse

No PFAS free products to date

Technical Challenge

Challenges: “Safer”

Avoid regrettable substitutions

Challenges: CBI

Confidential

Business

Information

Proprietary Formulations

Ingredients	%	Hazard(s)
Proprietary #1	?	?
Proprietary #2	?	?
Proprietary #3	?	?
Proprietary #4	?	?

= Unknown Hazards

Need: Hazard assessment

Evaluate *all* chemicals in the product

- Transparent method, assessed by 3rd party
- Hazard results communicated while protecting CBI

Ingredients	%	Hazard(s)
Proprietary #1	5	Benchmark-2
Proprietary #2	20	Benchmark-3
Proprietary #3	35	Benchmark-2
Proprietary #4	40	Benchmark-4

Resources

- A Guide to Purchasing PFAS-Free Food Service Ware by Cancer Free Economy Network
- Avoiding Hidden Hazards: A Purchaser's Guide to Safer Foodware by Center for Environmental Health
- GreenScreen® for Safer Chemicals by Clean Production Action

Thank You!

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SCRATCH SLIDES

Responding to PFAS in single use food ware

- Products must be certified or recognized by one or more of the following certification organizations or programs:
  - Biodegradable Products Institute (U.S.)
  - AIB Vinçotte Inter: OK Compost (Belgium)
  - Australian Environmental Labeling Association

C) Product may not contain perfluorinated grease barrier compounds. Bidders shall provide affadavits from manufacturer, guaranteeing that perfluorinated compounds were not used or added as the product was made.

B) All compostable plastic products offered must bear a clearly visible, easily distinguishable label or marking indicating the product's ability to be composted.

- The text of the product's label or marking must include the word "COMPOSTABLE."
- The label or marking must be present on each individual item.
- The State prefers the label or marking to be green in color and to include the logo of the certifying body.

C) Product may not contain perfluorinated grease barrier compounds. Bidders shall provide affadavits from manufacturer, guaranteeing that perfluorinated compounds were not used or added as the product was made.