CLEAN PRODUCTION ACTION

GreenScreen Certified™ Standard for Firefighting Foam

WEBINAR

JUNE 23, 2021

Clean Production Action – solutions for a safer & healthier tomorrow

BIZNGO FOR SAFER CHEMICALS & SUSTAINABLE MATERIALS

INVESTOR ENVIRONMENTAL HEALTH NETWORK

GREENSCREEN FOR SAFER CHEMICALS

CHEMICAL FOOTPRINT PROJECT

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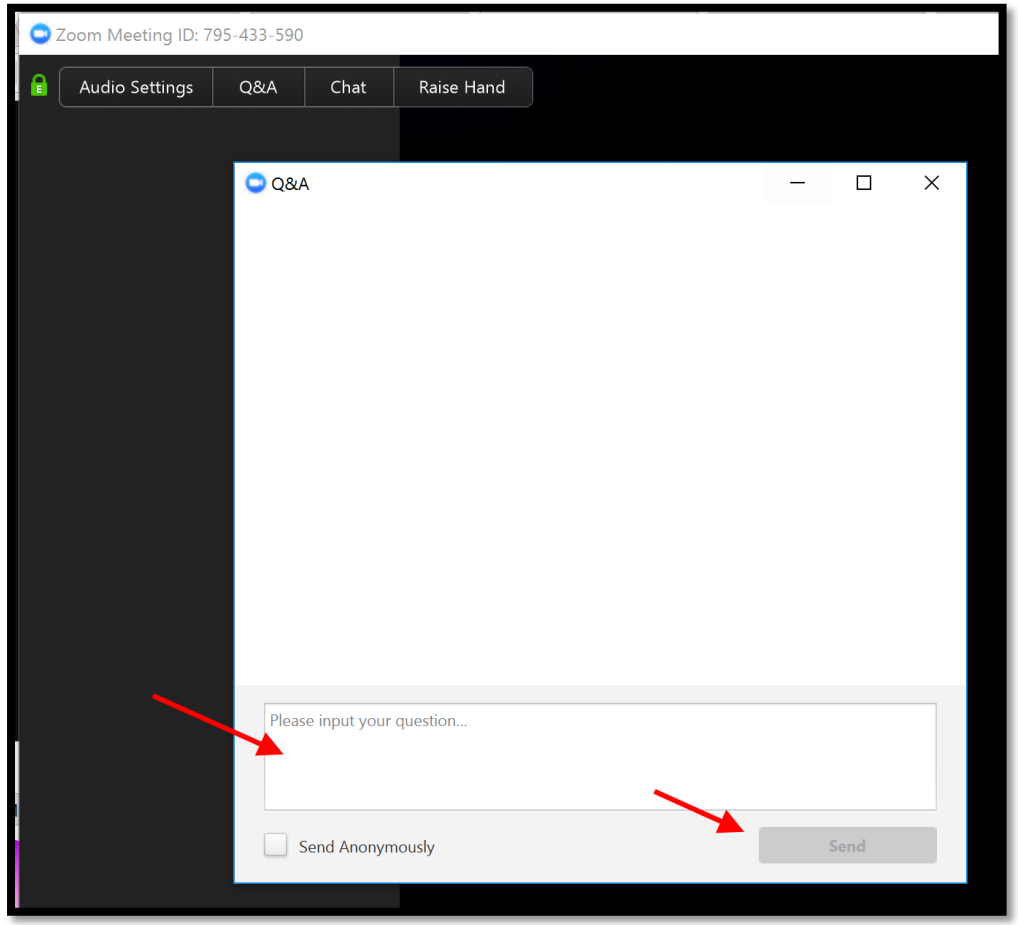
Webinar Questions



Post your question to the Q&A section of your Zoom Control Panel

Presentation and recording will be available at greenscreenchemicals.org

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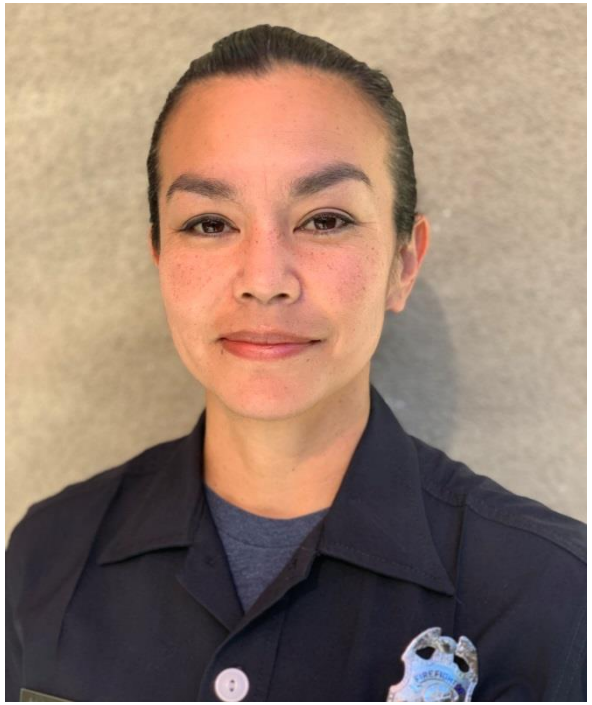
Speakers

Shari Franjevic
GreenScreen Program Manager
Clean Production Action



Arlene Nuñez
Firefighter
San Francisco Fire Department

Holly Davies
Senior Toxicologist
Washington State Department of Health

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Outline

1. GreenScreen Certified™ Firefighting Foam
2. Value of Certified Products to Firefighters
3. Value of Certified Products to Purchasers
4. Q&A

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Current State

- Just because it is legal doesn't mean it is not hazardous
- There are > 350,000* chemicals on the market

* *Environ. Sci. Technol.* 2020, DOI: 10.1021/acs.est.9b06379

- All products are made from chemicals
- But all chemicals on the market are not created equal
  - Some chemicals cause harm like cancer, birth defects and impaired fertility
  - Most chemicals on the market have not been thoroughly evaluated for their toxicity

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Identifying safer chemicals & products

Chemicals

Products

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GreenScreen: Globally Recognized & Used

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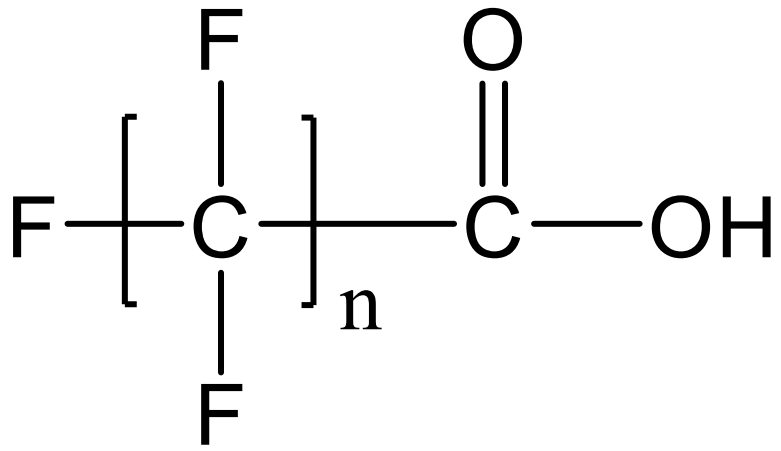
PFAS: Per- and Polyfluroalkyl Substances

PFAS



Carbon-fluorine bond is strongest in organic chemistry

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Why are PFAS Such a Big Deal?

- All PFAS ingredients in products break down eventually to chemicals that never degrade
- PFAS can harm health at low exposure levels, and some build up in our bodies

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PFAS Health Concerns

- Pregnancy-induced hypertension
- Liver damage
- Increased cholesterol
- Thyroid disease
- Immune system harm

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Are the alternatives better?

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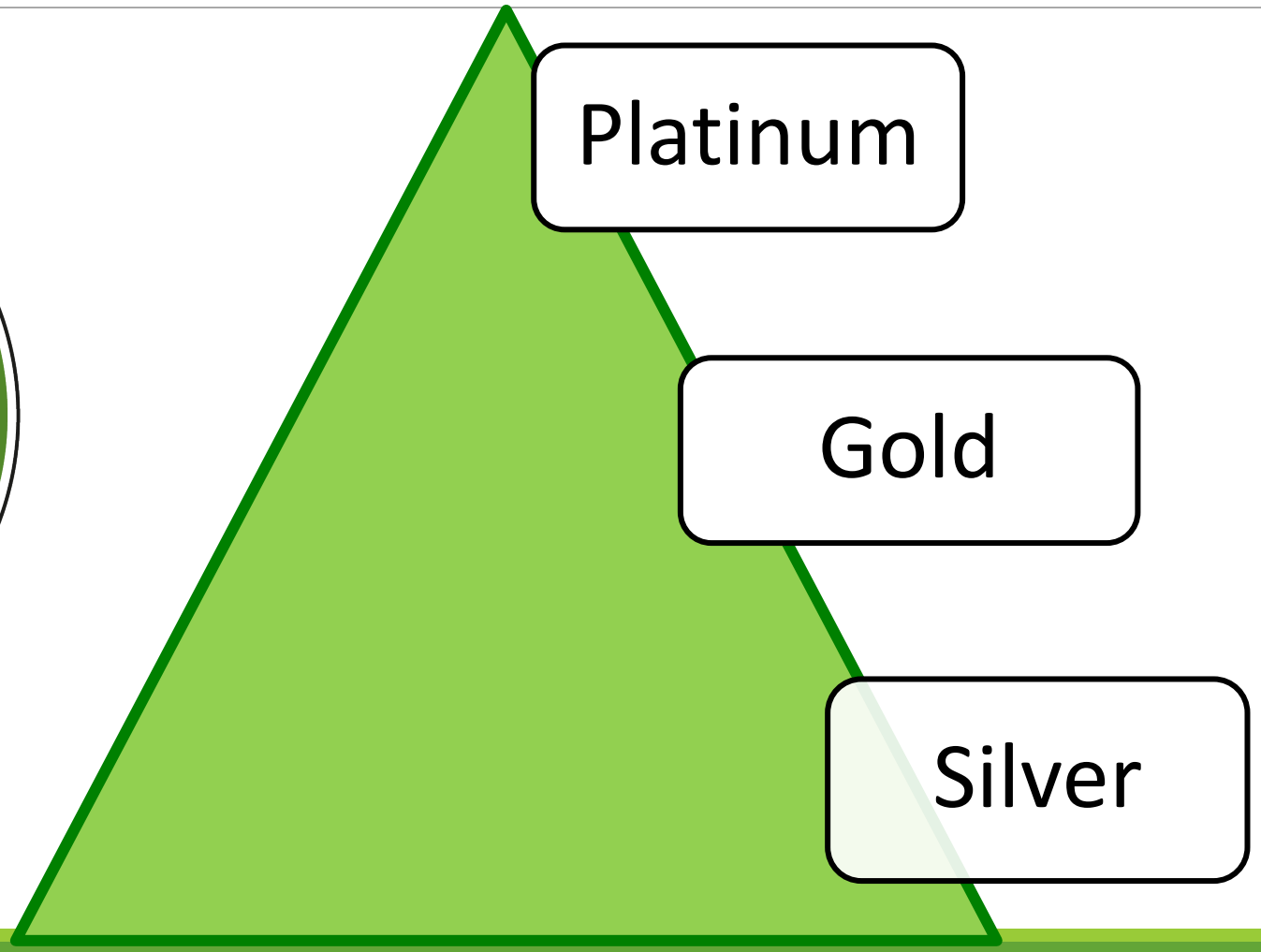
GreenScreen Certified: PFAS-Free and Preferred



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GreenScreen Certified™ for Firefighting Foam

1. All chemicals in the product must be disclosed under confidentiality
2. All chemicals in the product must be assessed for hazard using GreenScreen tools
3. Product must meets all Restricted Substances List requirements
4. Product must meets all analytical testing requirements

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Foam Concentrate verified PFAS-free

1. Three samples/lots tested at a commercial analytical laboratory
2. Testing for all PFAS by measuring total organic fluorine
3. < 1 ppm total organic fluorine

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Each chemical evaluated with GreenScreen

GreenScreen List Translator:

- Based on 42 lists from authoritative scientific bodies e.g.,
  - EU REACH Substances of Very High Concern
  - United Nations – Stockholm Persistent Organic Pollutants
  - World Health Organization's International Agency for the Research on Cancer (IARC)
- Automated and freely available

GreenScreen Hazard Assessment:

- Comprehensive review of 18 human and environmental health endpoints and all available data
- Conducted by Licensed toxicology firms

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Chemicals of High Concern are Prohibited

- **CMRs** =
  - Carcinogens,
  - Mutagens, or
  - Reproductive / Developmental Toxicants
- **PBTs** =
  - Persistent, and
  - Bioaccumulative, and
  - Toxic
- **Equivalent Concern =**
  - Endocrine Disruptors

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Avoids Other Chemical Classes of Concern

1. Alkylphenols and alkylphenol ethoxylates
2. Siloxanes: Cyclic volatile methyl siloxanes
3. Organohalogens
4. Zero Discharge of Hazardous Chemicals MRSL

Foam Concentrate not toxic to aquatic life

LC50 or EC50 > 10 mg/L for fish, aquatic invertebrates, and algae

	Effective concentration
Toxicity Category	Range (mg/L)
Super Toxic	< 0.01
Extremely Toxic	0.01 –0.1
Highly Toxic	0.1 –1
Moderately Toxic	1 –10
Slightly Toxic	10 –100
Practically Nontoxic	100 –1,000
Relatively Harmless	> 1,000

US Fish and Wildlife Service toxicity scale
Aquatic EC50 or LC50 (freshwater)

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List of GreenScreen Certified™ Products

https://www.greenscreenchemicals.org/certified/products/category/firefighting

GreenScreen Certified™

You are here: Home / Certified / Certified Products / Firefighting Foam

GreenScreen Certified™ Products > Firefighting Foam

Company	Product Type	Product	Level	Version & Certificate#	Expires	Notes
Angus Fire Ltd.	Firefighting Foam Class B	Respondol ATF 3/3	Silver	v2.1 #20211136	2026-04-21	EN1568 parts 3 and 4; UL 162; IMO MSC.1/Cicr. 1312; Lastfire batch certified
Angus Fire Ltd.	Firefighting Foam Class B	Jetfoam ICAO-C 6%	Silver	v2.1 #20211133	2026-04-21	ICAO Level C Certified
Angus Fire Ltd.	Firefighting Foam Class B	Jetfoam ICAO-C 3%	Silver	v2.1 #20211132	2026-04-21	ICAO Level C Certified
BIOEX	Firefighting Foam Class A & B Wetting Agent	ECOPOL F	Silver	v2.1 #20211016	2026-03-30	

GreenScreen Certified™ Standard for Firefighting Foam

Arlene Nuñez, Firefighter/Scientist

June 23, 2021

NFPA Codes and Standards

Code/Standard #	Name
NFPA 11	Standard for Low-, Medium-, and High-Expansion Foam
NFPA 11A	Standard for Medium- and High-Expansion Foam Systems
NFPA 11C	Standard for Mobile Foam Apparatus
NFPA 16	Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
NFPA 298	Standard on Foam Chemicals for Wildland Fire Control
NFPA 412	Standard for Evaluating Aircraft Rescue and Fire-Fighting Foam Equipment
NFPA 460	Standard for Aircraft Rescue and Firefighting Services at Airports, Recurring Proficiency of Airport Fire Fighters, and Evaluating Aircraft Rescue and Firefighting Foam Equipment
NFPA 1145	Guide for the Use of Class A Foams in Fire Fighting
NFPA 1150	Standard on Foam Chemicals for Fires in Class A Fuels

Firefighters held to NFPA Codes/Standards for safety

NFPA Codes and Standards

- Performance level requirements
  - Apparatus, appliances, hose
  - Control, suppress and prevent fires
  - Safety
- Training
  - Personnel
- Test methods
  - Personnel
  - Environment

International Firefighter Magazine

Cancer rates

January 2018 – December 2020 (2 years)

- 55 cases
  - 40% active
  - 60% retired
- Blood, brain, breast, GI, GU, lung, skin, etc

Research

- PFAS known to be in multiple aspects of firefighting
  - Firefighting foam
  - PPE
- Firefighters are under utilized for research
  - Biomonitoring
  - Issued equipment, PPE, fire suppression material
- Underwriters Laboratory (UL), NIST
  - Need for comparable studies

Stanford University PFAS/PPE Study

Summary

- Challenges for change
  - NFPA standards
  - Training and implementation
- Risk vs. Benefits
  - Known high rate of cancer
  - Quality of life

SFFD

Washington State Department of Health

GreenScreen Certified Fluorine Free Firefighting Foam

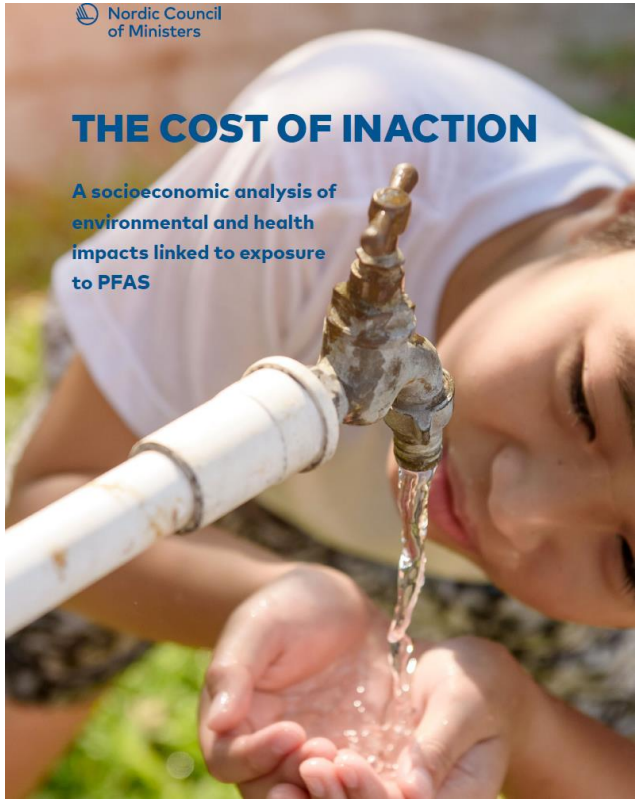
Holly Davies, PhD

June 23, 2021

Costs of PFAS Exposure

- Nordic Council “The Cost of Inaction”
- Case studies- chemical production, product manufacture, use, disposal
- Health costs (annual)
  - High, med, and general population exposure estimates
  - Europe EUR 52-84 billion
  - USA USD 37-59 billion
- Environmental costs-

  Drinking water remediation and soil cleanup (20 years)
  - Europe EUR 16.9 Billion
  - USA USD 12.1 Billion



Human Health

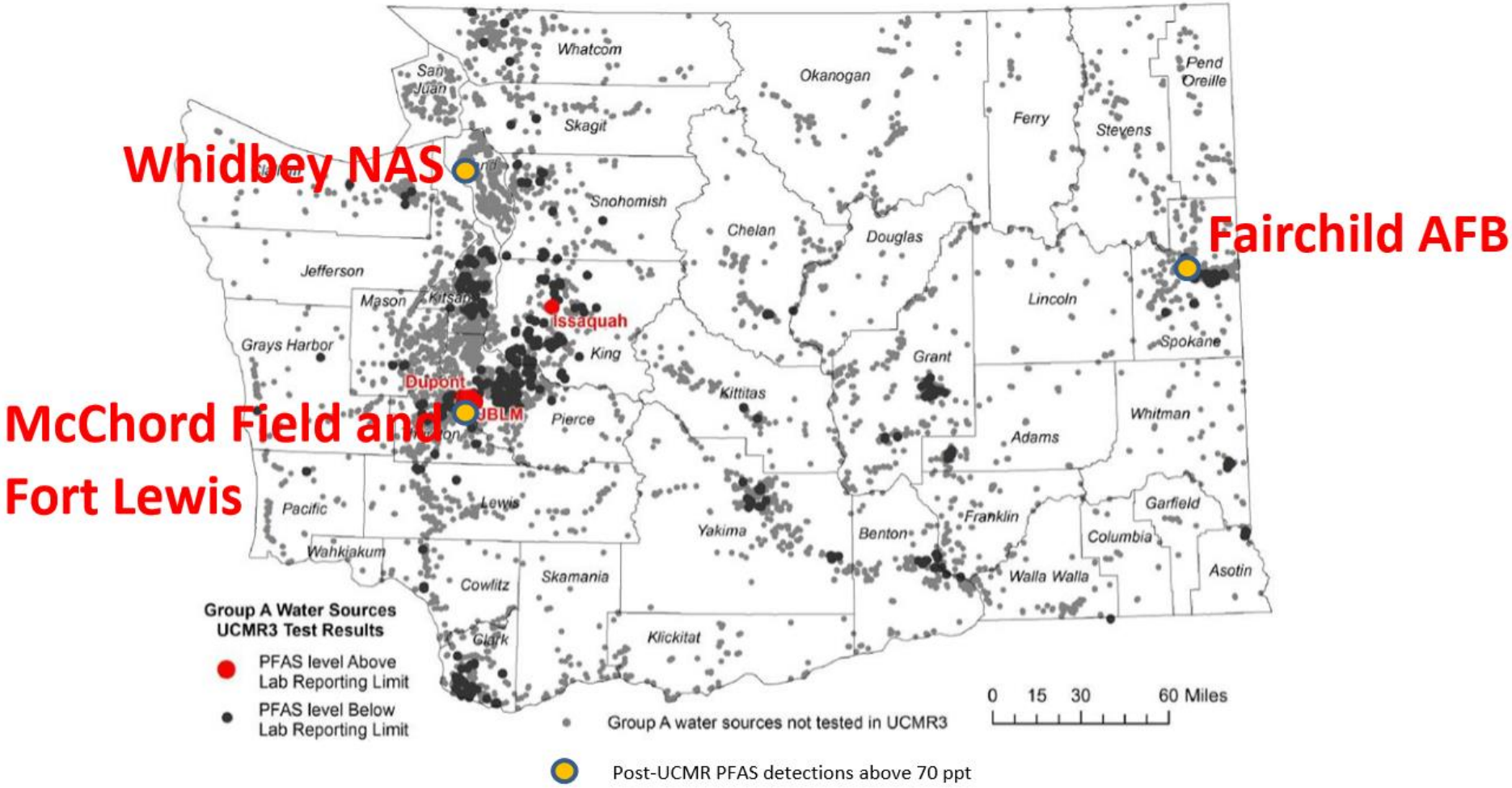
Widespread exposure

- Drinking water, food, dust
  - Children
  - Occupational
- CDC biomonitoring

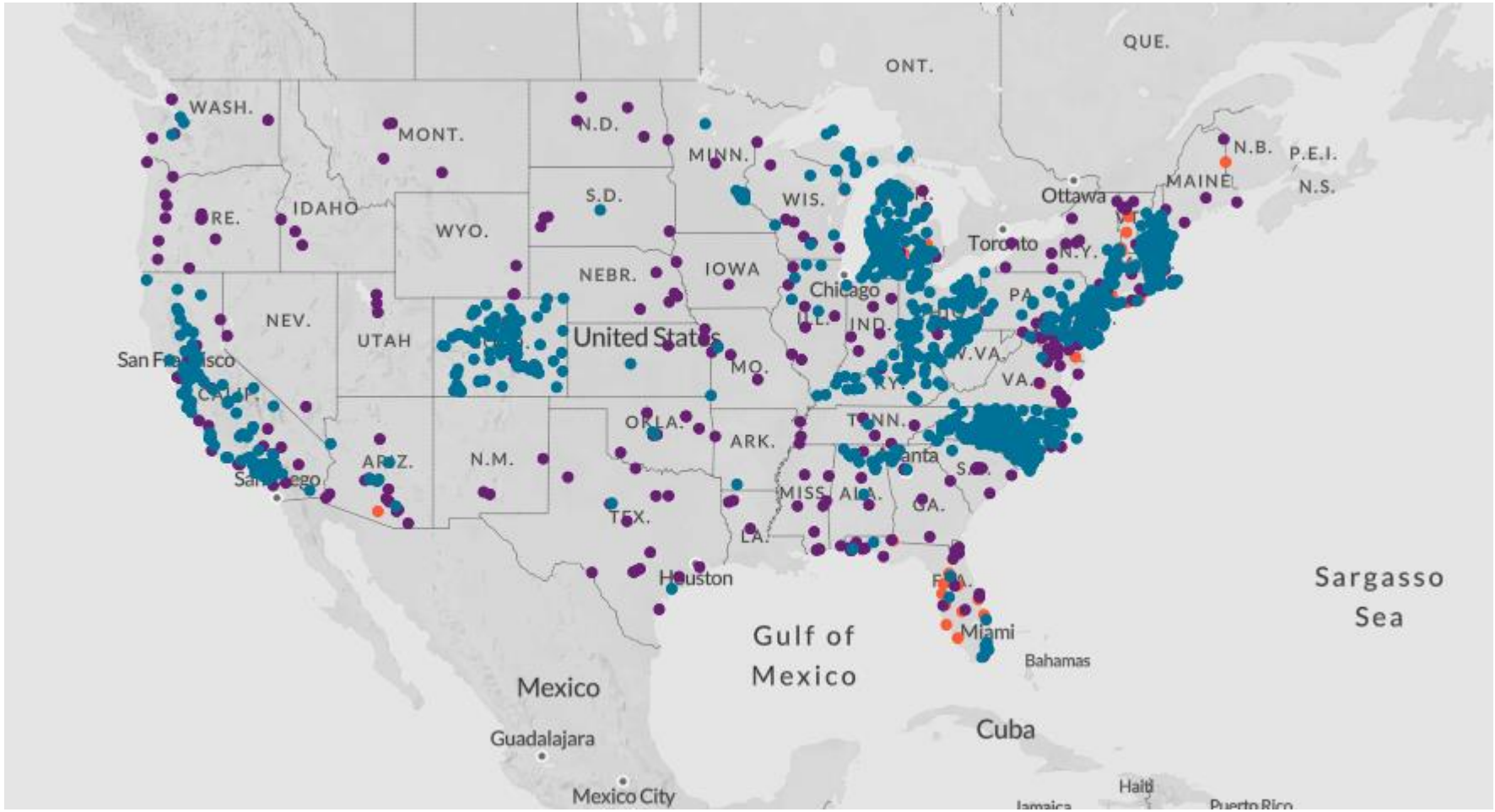
Health effects

- Inc. cholesterol levels
- Liver damage
- Immune system
- Thyroid disease
- Developmental effects
- Decreased fertility
- Cancer

WA Drinking Water Testing



National Contamination

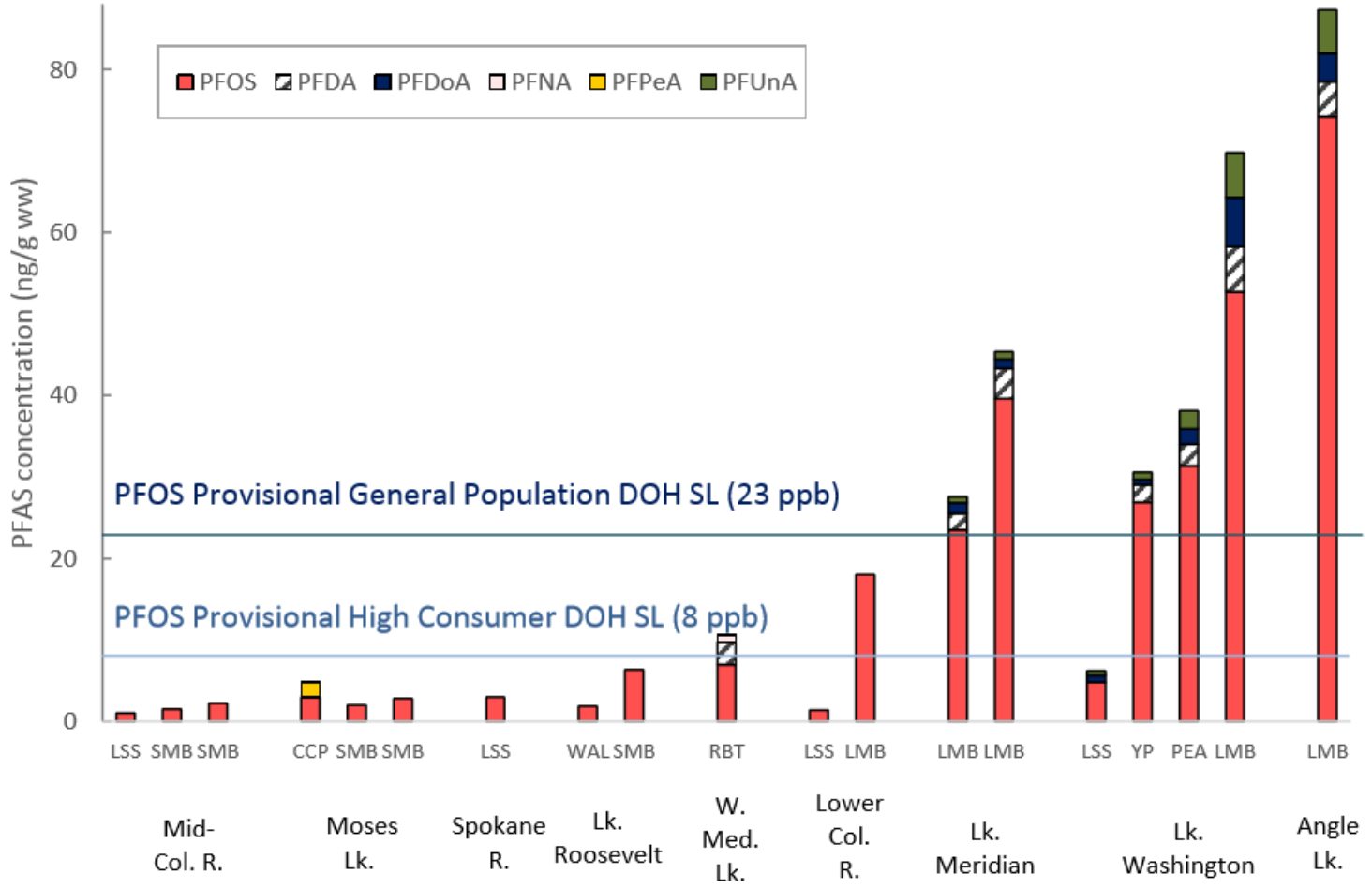


- Drinking Water
- Military Sites
- Other known sites

Map from EWG

WA Environmental Monitoring

Widespread presence in surface waters, WWTP effluent, fish tissue, and osprey eggs



Selected Actions

- EPA looking at clean up, drinking water standards (PFOS/PFOA/GenX), tox screening, testing methods
- Firefighting foam research and development
- Treatment methods

- 2018 WA state law
  - AFFF ban for training as of July 2018
  - 2020 ban for sale unless required by federal law
- Similar laws in AZ, CA, CO, KY, MI, MN, NV, NH, NY

- Federal law to remove PFAS requirement from FAA regulation
- Other countries use fluorine free foam (ICAO)

Safer Alternatives

- Reduce risk by reducing hazard
- Avoid regrettable substitutes

GreenScreen Certified

- Tool for identifying safer alternatives
  - Scientifically credible
  - Transparent
  - Collaborative
  - Informative

SDS example

3. Composition/information on Ingredients

3.1. Mixture

The following component(s) in this product are considered hazardous under applicable OSHA(USA)

Chemical name	CAS No	weight-%
2-Methyl-2,4-pentanediol	107-41-5	5 - 10
Proprietary Hydrocarbon Surfactants	Proprietary	5 - 10
Proprietary Hydrocarbon Surfactants	Proprietary	3 - 7
Proprietary Hydrocarbon Surfactant	Proprietary	1 - 5
Propan-2-ol	67-63-0	1 - 5
3-Butoxy-2-propanol	5131-66-8	1 - 5

Conclusions

- Prevention
  - Avoid health effects and costs
- Cleanup and management
  - Expensive
- Protect human health and the environment
- Purchase safer alternatives

Holly Davies, PhD
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Washington State Department of Health

Questions 

Shari Franjevic
GreenScreen Program Manager
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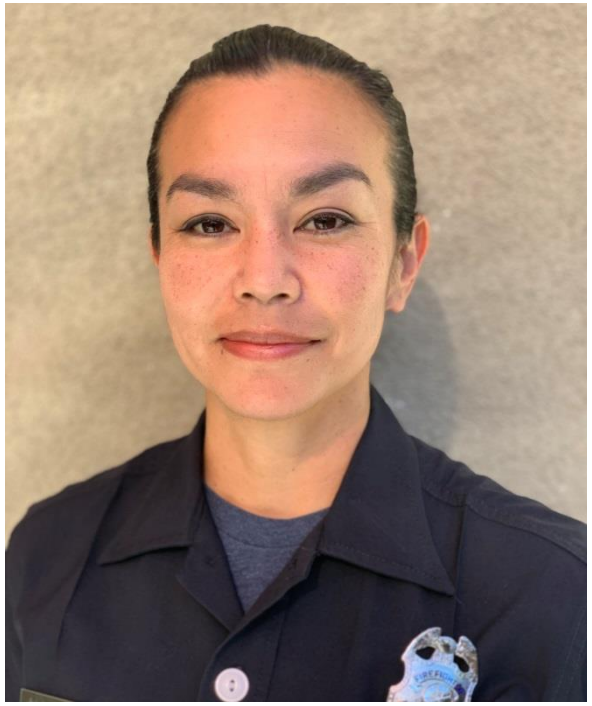

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Thank you!

Recording of the webinar will be posted on the website

Contact Clean Production Action:

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https://www.greenscreenchemicals.org/

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