

Environmental Restoration (ER) Technical Session PFASs: State-of-the-Art Research and Development in Sampling, Analysis, Treatment, and Effects

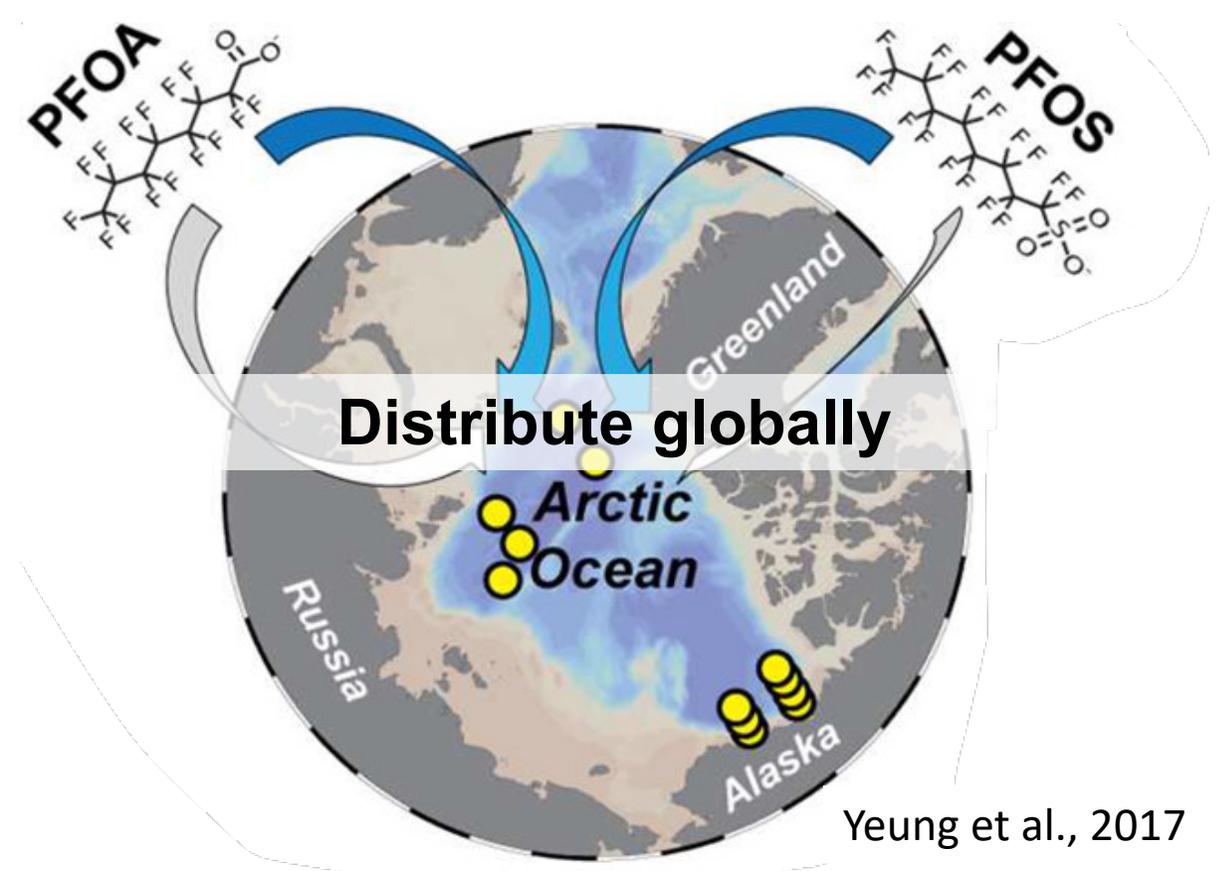
Co-Chairs:

Jennifer Field, Oregon State University

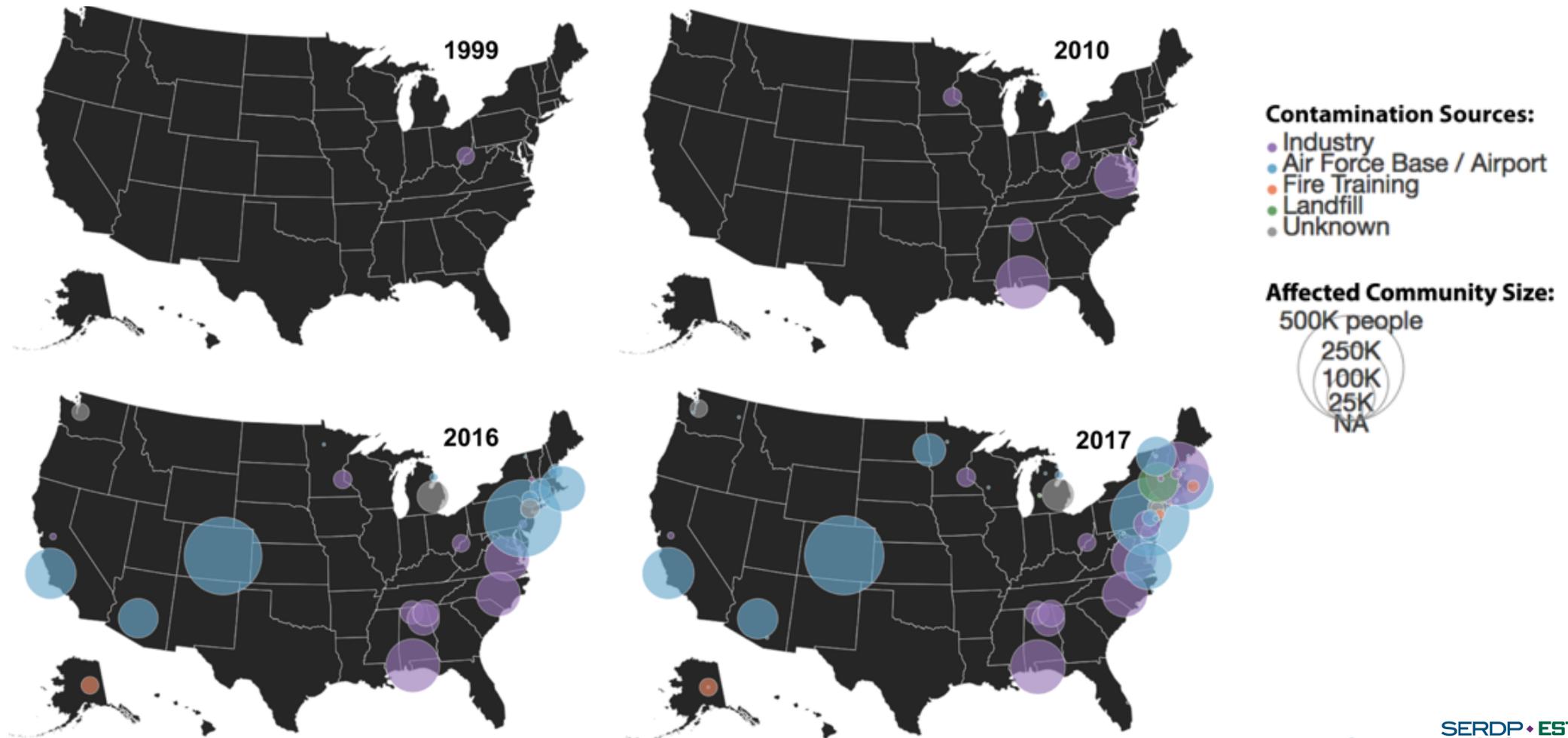
Elsie Sunderland, Harvard University



Poly- and perfluoroalkyl substances (PFAS) are local and global contaminants



SERDP-ESTCP is developing methods to clean up our most contaminated sites



The PFAS Challenge

- Unique chemistry
 - ✓ complex
 - ✓ proprietary chemistry
- Complex nomenclature
- ✓ Properties not easily predicted due to ionic head and fluorinated tails
- ✓ Growing number of analytical tools
- ✓ Multiple sources, background concentrations, potential for analytical artifacts

The PFAS Challenge

- Growing public, state, federal awareness
- State monitoring and source reduction programs
- Growing number of analytical tools of increasing specificity (individual PFAS, oxidizable precursor assay, total fluorine methods)
- Sampling guidance

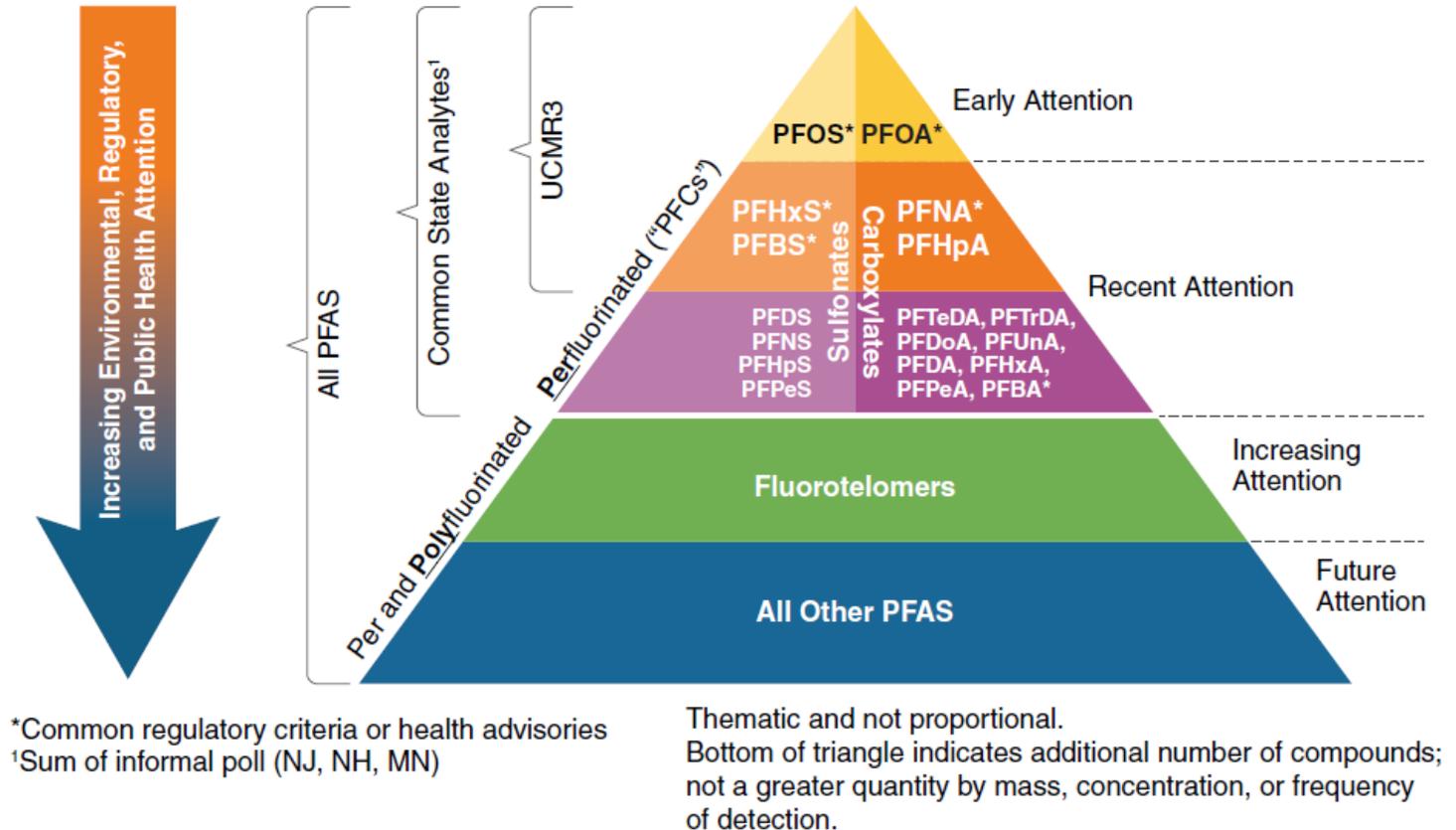


Figure 3-1. Emerging awareness and emphasis on PFAS occurrence in the environment
 (Source: J. Hale, Kleinfelder, used with permission)

AFFF Challenge

Aqueous film forming foams (AFFF)

- ✓ mixed with water released outdoors during training & emergency response
- ✓ long-term, repetitive use at select sites on bases
- ✓ concentrations orders of magnitude above EPA HALs
- ✓ extensive plumes of AFFF-contaminated groundwater
- ✓ legacy practices stopped but contamination remains
- ✓ drinking water impacts

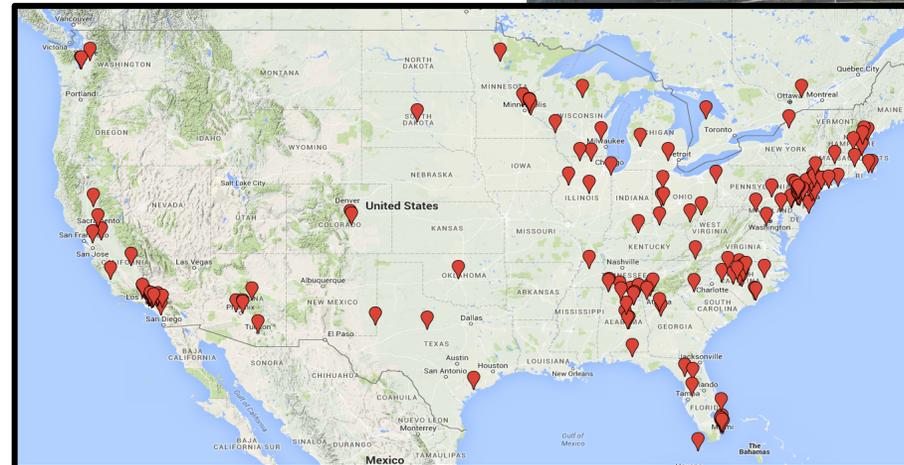


Photo Courtesy: September 2019 EGLE report

SERDP ESTCP Research Portfolio

2011 *In-situ* groundwater remediation

2015/16 Ecotoxicity

2016/17 Fluorine-free foams, thermally enhanced oxidation/pump & treat

2018 Source zones, ecorisk/assessing remediation, ion exchange and low energy electrical discharge plasma, life cycle comparison of ex-situ treatments

2019 Analytical/sampling methods, mobile-lab based analysis, remedial technologies, source zone treatment

2020 Biodegradation, passive sampling, leaching, forensics

Result: comprehensive research portfolio with national & international impact

Schedule: Wednesday December 4

Keynote: Dr. Hunter Anderson, AFCEC

Dr. Linda Abriola, Tufts U

Dr. Lisa Alvarez-Cohen, UC Berkeley

Break

Dr. Jinyong Liu, UC Riverside

Dr. Damian Helbling, Cornell U

Dr. Ezra Cates, Clemson

Poster session

Thematic Questions Addressed Day 1

- How are PFAS transported and transformed away from source zones (Anderson/Abriola)?
- What processes are occurring at the air-water interface and how does the presence of other pollutants affect transport and transformation (Abriola)?
- How can we reduce PFAS in contaminated soils and water (Cohen/Lui/Helbling/Cates)?
- What is the pathway for transforming these technologies to field-scale applications (Cates)?