PFAS

A Growing Public Health Crisis

So Cal Water Dialogue

October 23, 2019

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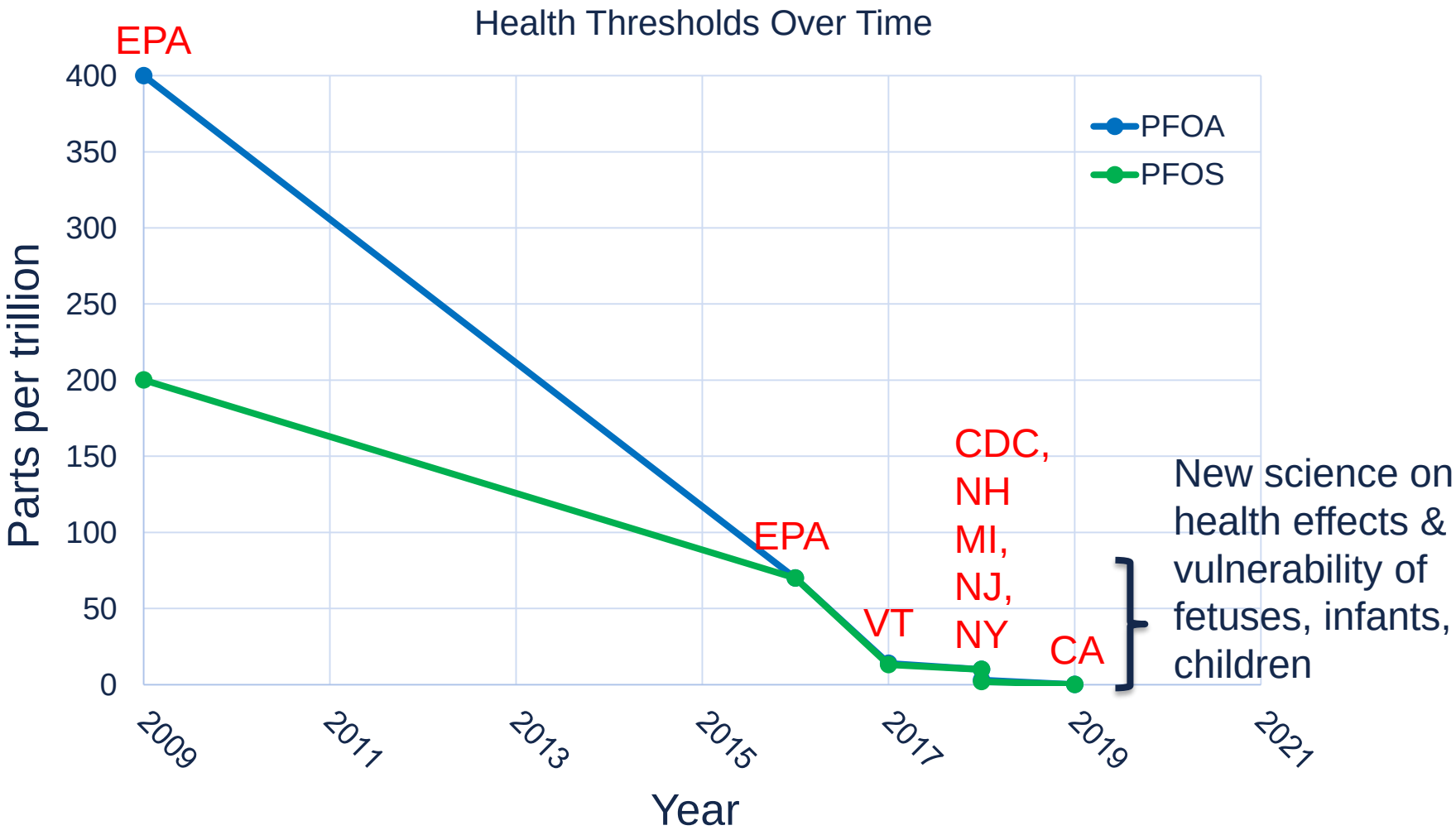
Talk Outline

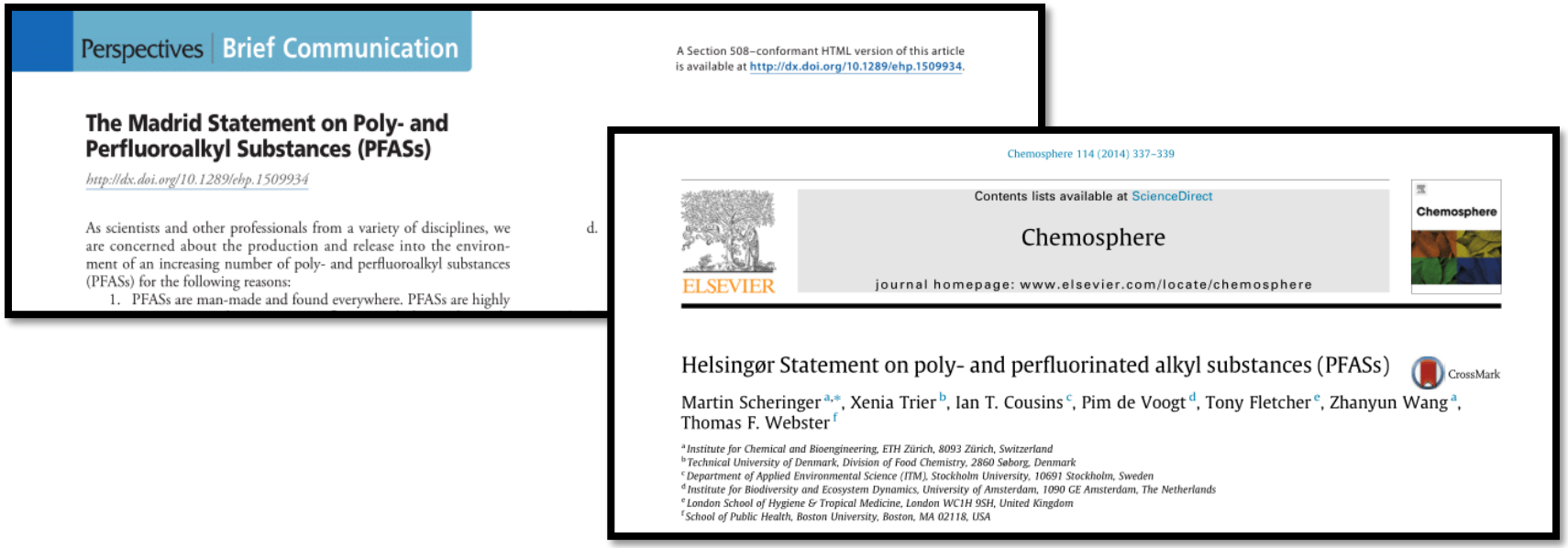
- Why we are concerned about PFAS
  - General problematic properties
  - State of science on health effects
- Current regulatory efforts to address PFAS
  - Examples of federal and state efforts
  - California-specific needs

Increasing Concern - Individual PFAS



Increasing Concern - PFAS as a Class

1. Extremely persistent
2. Highly mobile
3. Associated with a wide variety of adverse health effects



Perspectives | Brief Communication

A Section 508–conformant HTML version of this article is available at http://dx.doi.org/10.1289/ehp.1509934.

The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)

http://dx.doi.org/10.1289/ehp.1509934

As scientists and other professionals from a variety of disciplines, we are concerned about the production and release into the environment of an increasing number of poly- and perfluoroalkyl substances (PFASs) for the following reasons:

1. PFASs are man-made and found everywhere. PFASs are highly

d.

Chemosphere 114 (2014) 337–339

Contents lists available at ScienceDirect

Chemosphere

journal homepage: www.elsevier.com/locate/chemosphere

ELSEVIER

Helsingør Statement on poly- and perfluorinated alkyl substances (PFASs)

CrossMark

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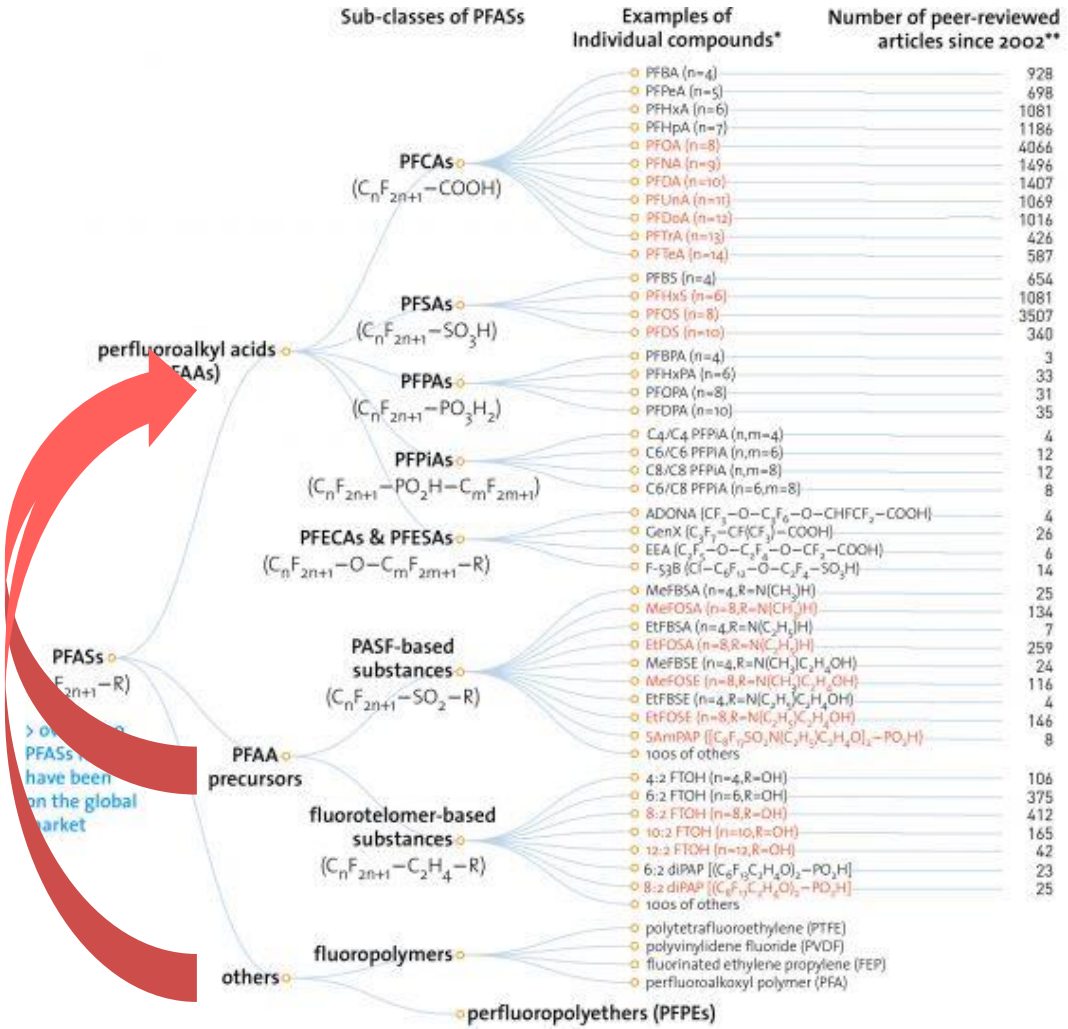
Increasing Concern - PFAS as a Class

- Found all over: air, water, soil, food, animals, plants, humans
- Increasing amounts of unknown PFAS in humans and the environment as more and more varieties produced and used
- Close to 5,000 PFAS now…
- How to evaluate such a large class from a regulatory and public health perspective?

Yeung LW and Mabury SA, 2016. Are humans exposed to increasing amounts of unidentified organofluorine. *Environ. Chem*, 13(1), 102-110.
McDonough C, et al., 2016. Measuring total PFASs in water: The tradeoff between selectivity and inclusivity. Current Opinion in *Environ Sci & Health,* 7:13-18

All Roads Lead to PFAAs



Wang Z, et al., 2017. A never-ending story of per- and polyfluoroalkyl substances (PFASs)? *Environ Sci Technol* 51(5):2508-2518

Health Effects Linked to PFAA Exposure

Summary of ATSDR's Findings on Health Effects from Perfluoroalkyl Acid Exposure

	Immune	Developmental & Reproductive	Lipids	Liver	Endocrine	Body Weight	Blood
PFOA	×	×	×	×	×	×	×
PFOS	×	×	×	×	×	×	×
PFHxS	×	×		×	×		×
PFNA	×	×	×	×	×	×	
PFDeA	×	×	×	×	×	×	
PFDoA	×	×		×		×	
PFUA	×	×		×		×	×
PFHxA		×		×			×
PFBA		×		×	×		×
PFBS		×		×	×		×
GenX	×	×		×			

Additive and/or synergistic effects likely

Short-chain PFAS Health Concerns

- Introduced as ‘safer’ alternatives due to their supposed shorter half-lives in humans
  - Found to accumulate in organs, some at concentrations that are higher than long-chain PFAS[1]
- Highly persistent, more mobile in the environment and harder to treat than long-chain PFAS[2]
  - Continual exposure - elimination rate may be an inadequate measure of health threat to humans[3,4]

1. Pérez F, et al., 2013. Accumulation of perfluoroalkyl substances in human tissues. *Environ Int*, *59*, 354-362.
2. Wang Z, et al., 2015. Hazard assessment of fluorinated alternatives to long-chain perfluoroalkyl acids (PFAAs) and their precursors: Status quo, ongoing challenges and possible solutions. *Environ Int* 75:172-179
3. Gomis MI, et al., 2018. Comparing the toxic potency in vivo of long-chain perfluoroalkyl acids and fluorinated alternatives. *Environ Int* 113:1–9.
4. Brendel S., et. al. (2018) Short-chain perfluoroalkyl acids: environmental concerns and a regulatory strategy under Reach. Environ Sci Eur, 30(1): 9

Health Conclusions

- PFAS are a serious public health threat
  - Wide-spread exposure
  - Health risks at extremely low level exposures
  - Likely additive/synergistic effects
- Need to reduce PFAS exposures, as a class:
  - Stop production, use and release of PFAS
  - Clean up PFAS from our environment, i.e. drinking water
  - Ensure safe disposal, destruction of PFAS

Stop Further Release of PFAS

- Federal legislation
  - Previous – FDA petition on PFAS in food packaging
  - Current – NDAA (phase out AFFF, require reporting of industrial discharges)
- Consumer products
  - Phase out of PFAS in carpets and rugs
    - Home Depot
    - CA Safer Consumer Products program

Sources

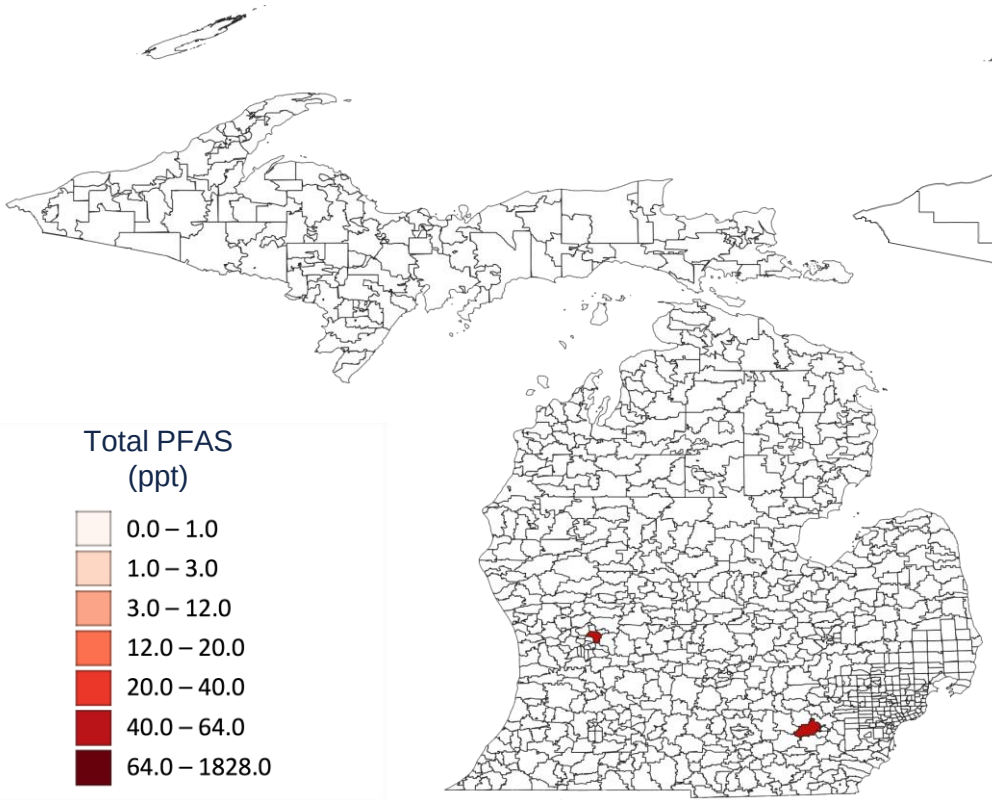
- Industrial sites
- AFFF use – DOD sites, airports
- Food packaging
- Carpets, rugs, furniture
- Apparel
- Personal care products
- Cookware
- Landfills
- Wastewater and recycled water
- Artificial Turf

A wide variety of PFAS found at most sources.

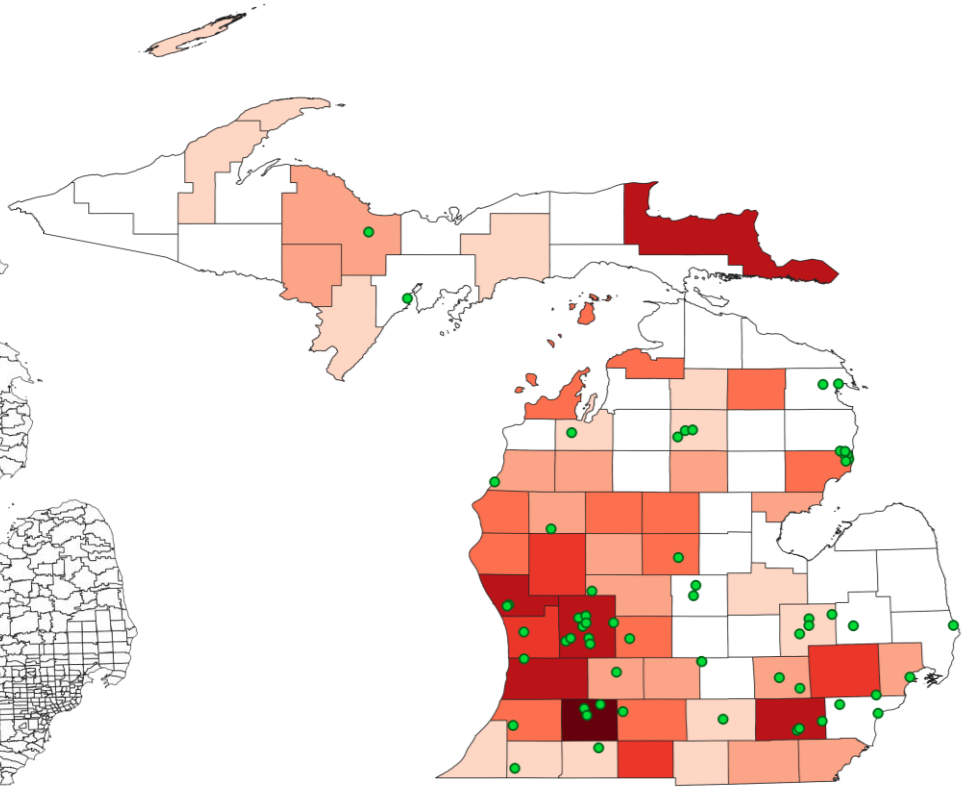
Clean Up PFAS

- Federal legislation (proposed NDAA amendments)
  - Accelerate PFAS cleanups at military facilities through the use of cooperative agreements
  - Require ground and drinking water monitoring
  - Add to CERCLA and CWA
- State-level engagement – MI, CA, NY, NH, NJ, etc…
  - Increased monitoring in drinking water
  - Strict water standards

National UCMR3 vs. Michigan Testing



3 detects in 2 zip codes



60+ contamination sites
100+ public water systems

https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3
https://www.michigan.gov/pfasresponse/0,9038,7-365-86511---,00.html
https://www.michigan.gov/pfasresponse/0,9038,7-365-86510_87918-464299--,00.html

State Action

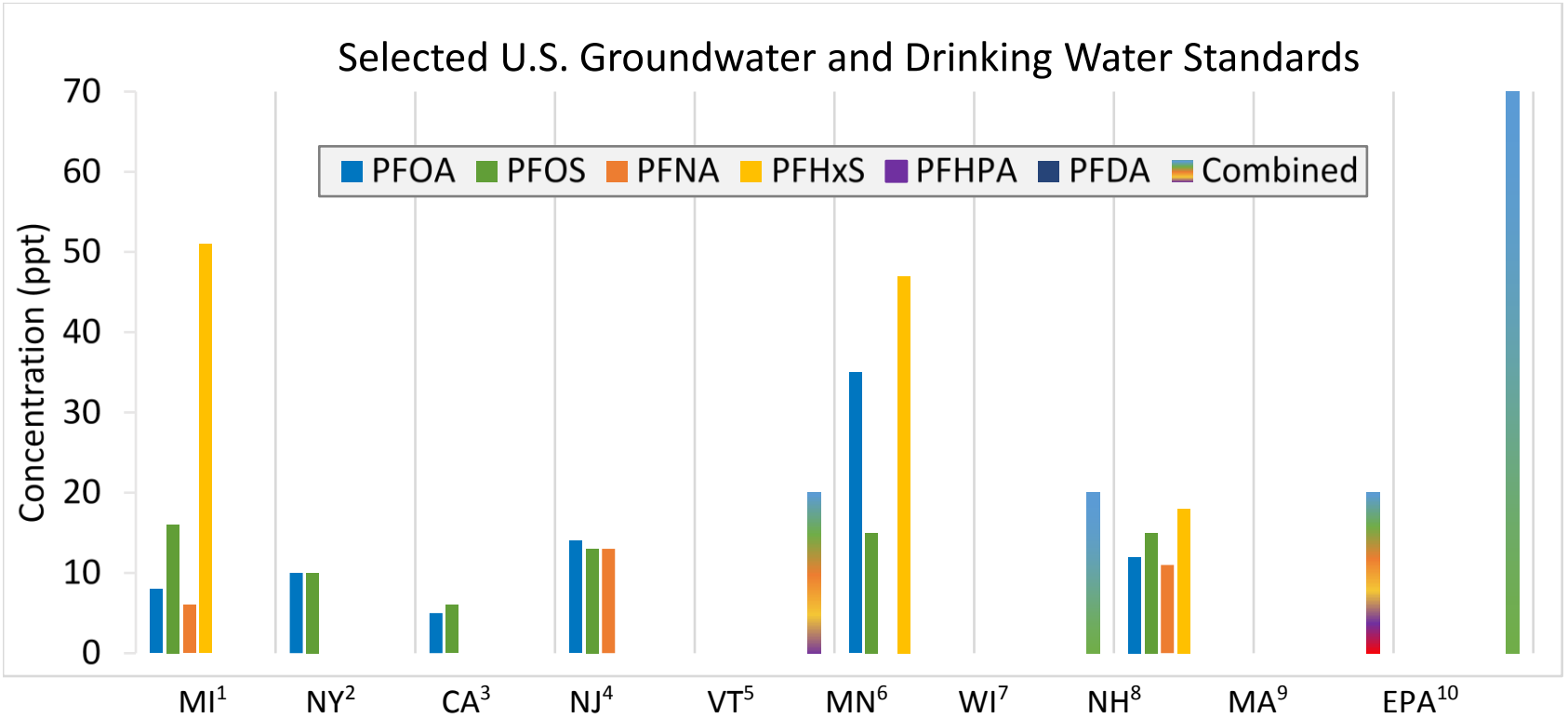


Figure 1: States are evaluating the health effects of PFAS and generating their own, more health-protective standards or guidelines for concentrations in drinking water or groundwater, much lower than the federal EPA health advisory of 70 ppt. Data reported here include both proposed and adopted levels as of August 2019. Figure is adapted from The Endocrine Disruption Exchange.

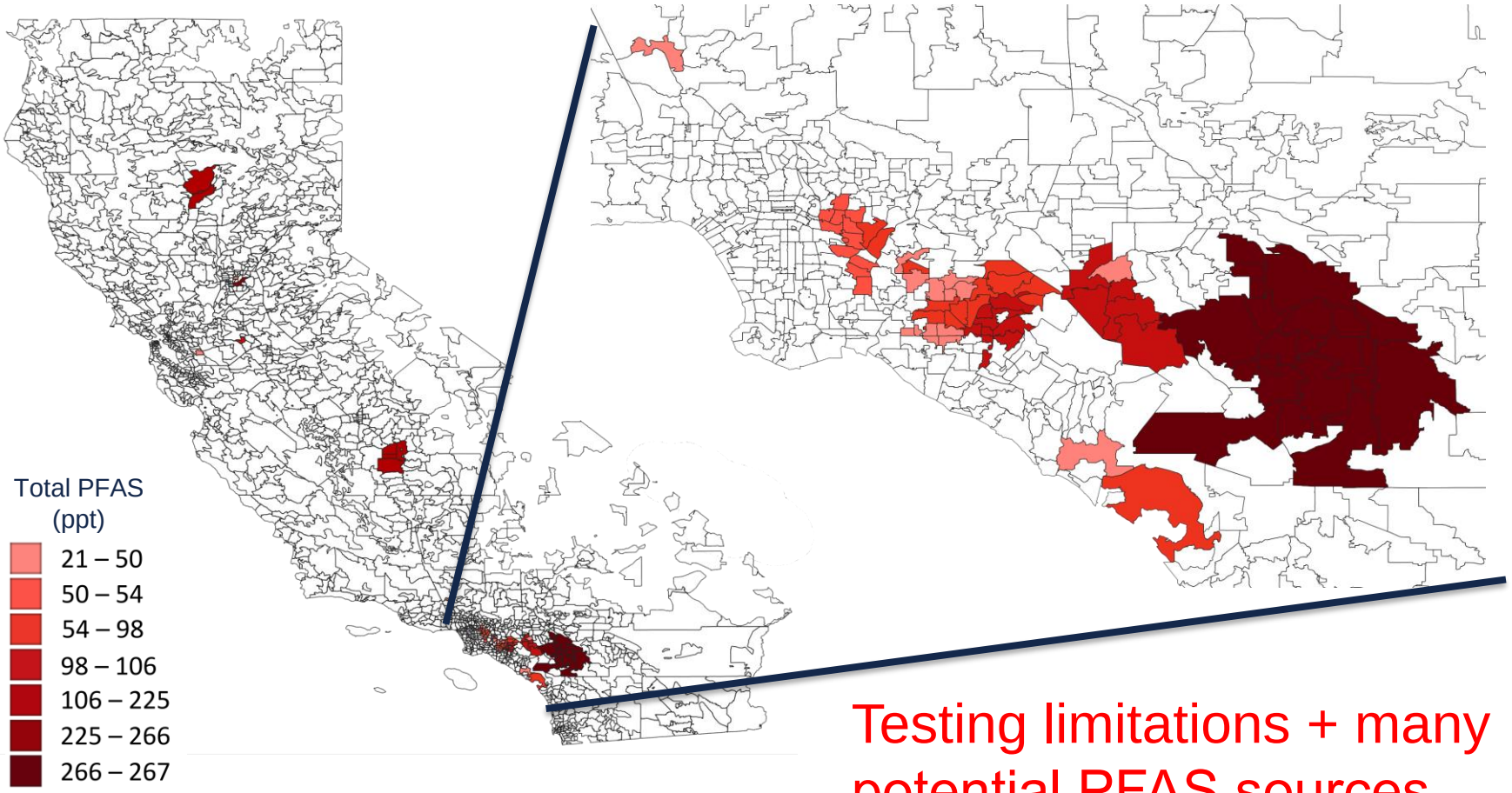
Safe Disposal, Destruction of PFAS

- Federal Legislation (proposed NDAA amendments)
  - Ensure safe and effective disposal of military PFAS waste
  - Provide general guidance on disposal of PFAS waste
  - Funding for research
- Still need end-of-life solutions for: AFFF, biosolids, treatment waste, consumer products, etc.

California


CLEAN WATER ACTION
NRDC
PLANNING AND CONSERVATION LEAGUE
The Environmental Justice Coalition for Water
Water Justice for All
COMMUNITY WATER CENTER
EL CENTRO COMUNITARIO POR EL AGUA
Green Science Policy Institute
SAN FRANCISCO BAYKEEPER
WOMEN'S VOICES FOR THE EARTH
OUR HEALTH, OUR FUTURE, TOXIC FREE
ecology center
Breast Cancer Prevention Partners
Exposing The Cause Is The Cure
UPSTREAM
Real Change Starts at the Source
CLEAN PRODUCTION ACTION
SAVE OUR SHORES
plasticpollutioncoalition
Californians Against Waste
PSR
Physicians for Social Responsibility
SAN FRANCISCO BAY AREA
THE STORY OF STUFF PROJECT
CEH
CENTER for ENVIRONMENTAL HEALTH
I R M
Integrated Resource Management, Inc.
Know your environment. Protect your health.
ewg
Erin Brockovich Foundation, Inc.
7th GENERATION Advisors
CPSC
California Product Stewardship Council
CALPIRG
Standing Up To Powerful Interests
CENTER for BIOLOGICAL DIVERSITY
Because life is good.
SYRCL
EARTHJUSTICE
BECAUSE THE EARTH NEEDS A GOOD LAWYER
HBN
HEALTHY BUILDING NETWORK

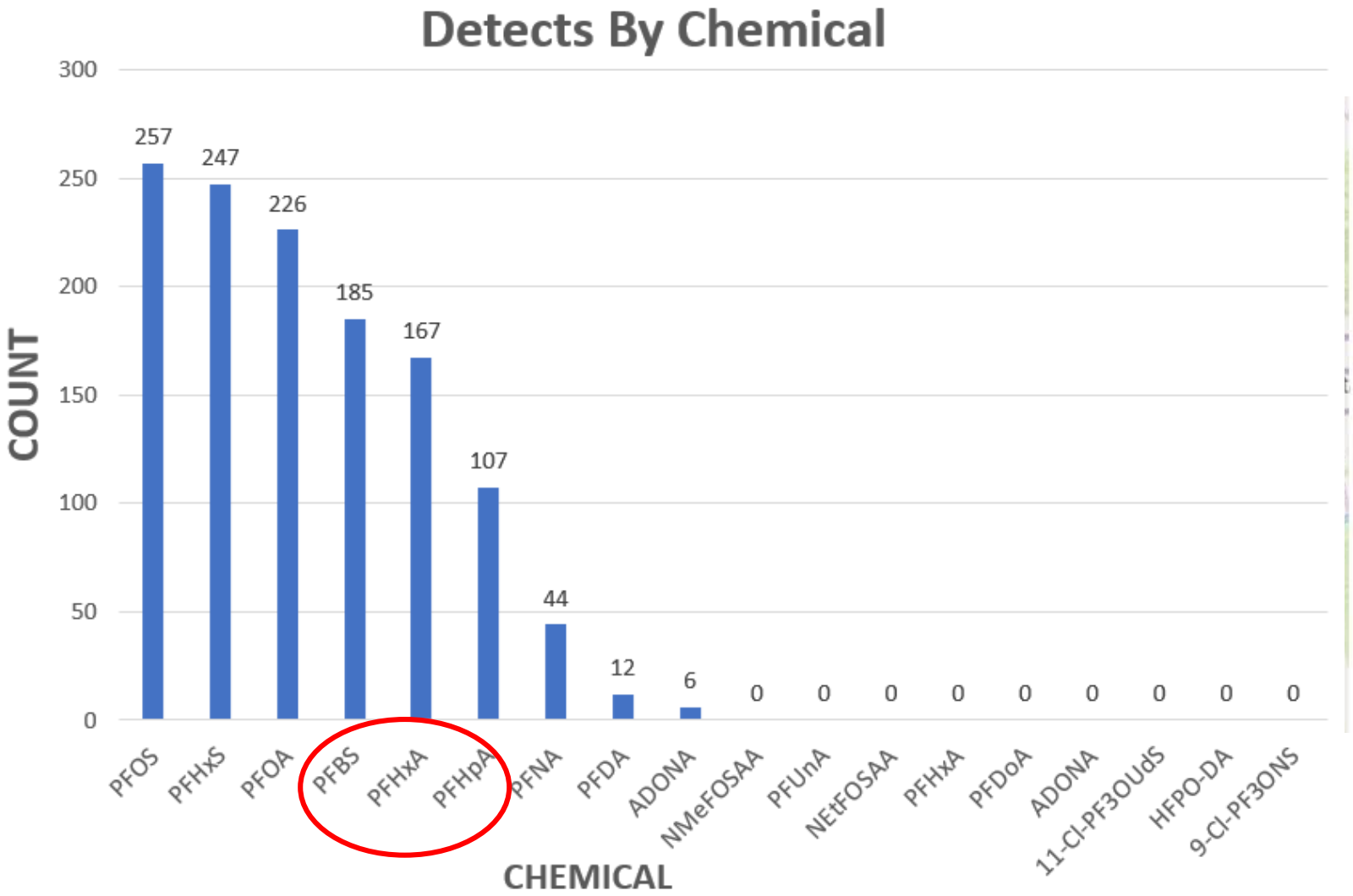
CA PFAS Contamination - UCMR3



Testing limitations + many potential PFAS sources…

https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3

Phase 1 Site Investigation Data



https://www.waterboards.ca.gov/pfas/

CA Biomonitoring Data

California Regional Exposure Study, Los Angeles County (CARE-LA)

- Collected in 2018
- Over 90% detection rate: Me-PFOSA-AcOH, PFHxS, PFNA, PFOS, PFOA
- 11 different PFAS detected

Asian/Pacific Islander Community Exposures (ACE) Project

- Collected 2016-2017
- Over 90% detection rate: Me-PFOSA-AcOH, PFHxS, PFNA, PFOS, PFOA, PFUA, PFHxA
- 14 different PFAS detected

Key Actions Needed in CA

Comprehensive approach

- PFAS as a class
- Multi-Agency Taskforce
- Phase out use of PFAS
- Expanded monitoring
- Clean up drinking water
- Invest in better, low-cost testing, treatment, disposal solutions
- Ensure polluters pay fair share of the costs

Thank you

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