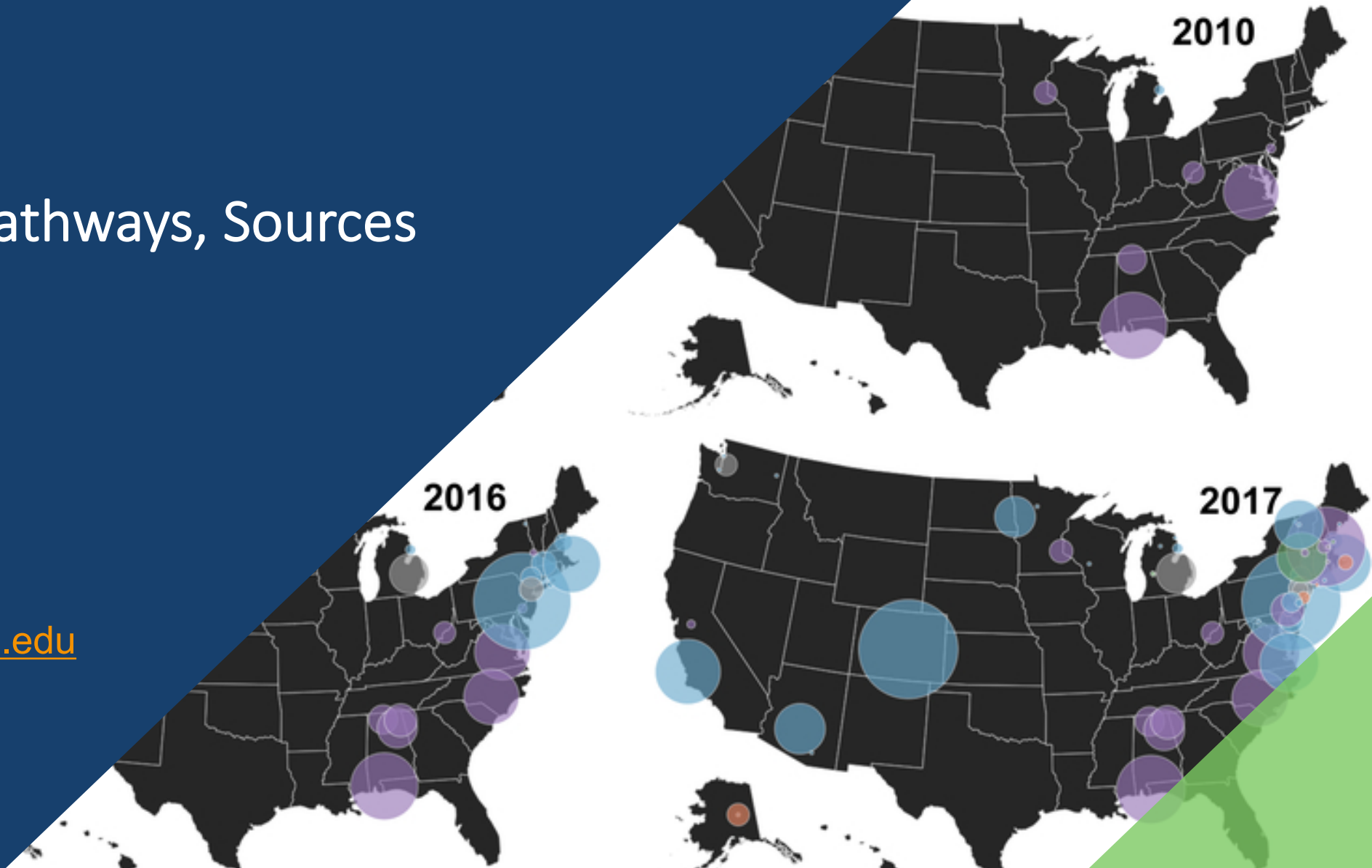
Harvard John A. Paulson School of Engineering and Applied Sciences

HARVARD SCHOOL OF PUBLIC HEALTH
Department of Environmental Health

Biogeochemistry of Global Contaminants HARVARD

PFAS Exposure Pathways, Sources and Time Trends



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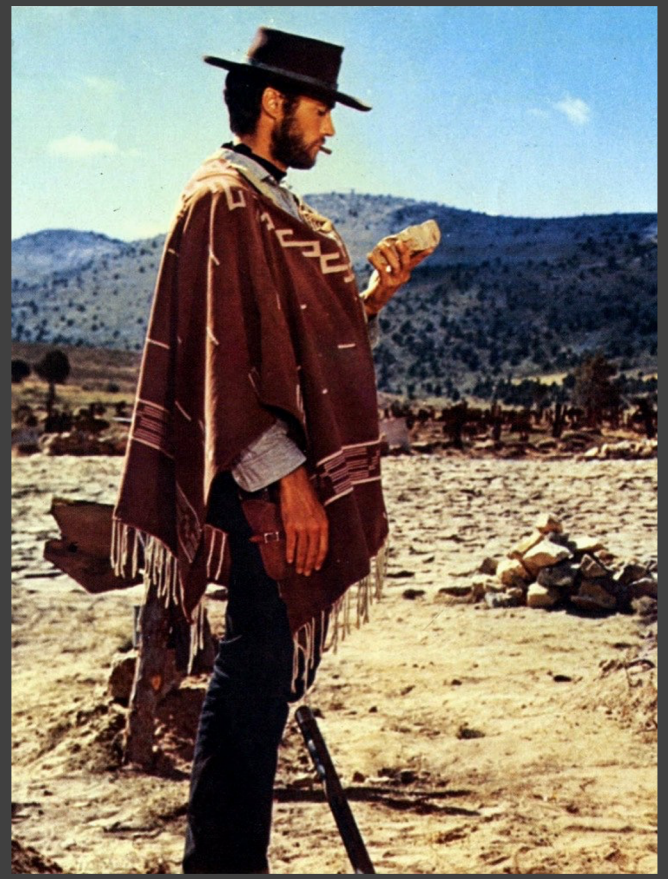
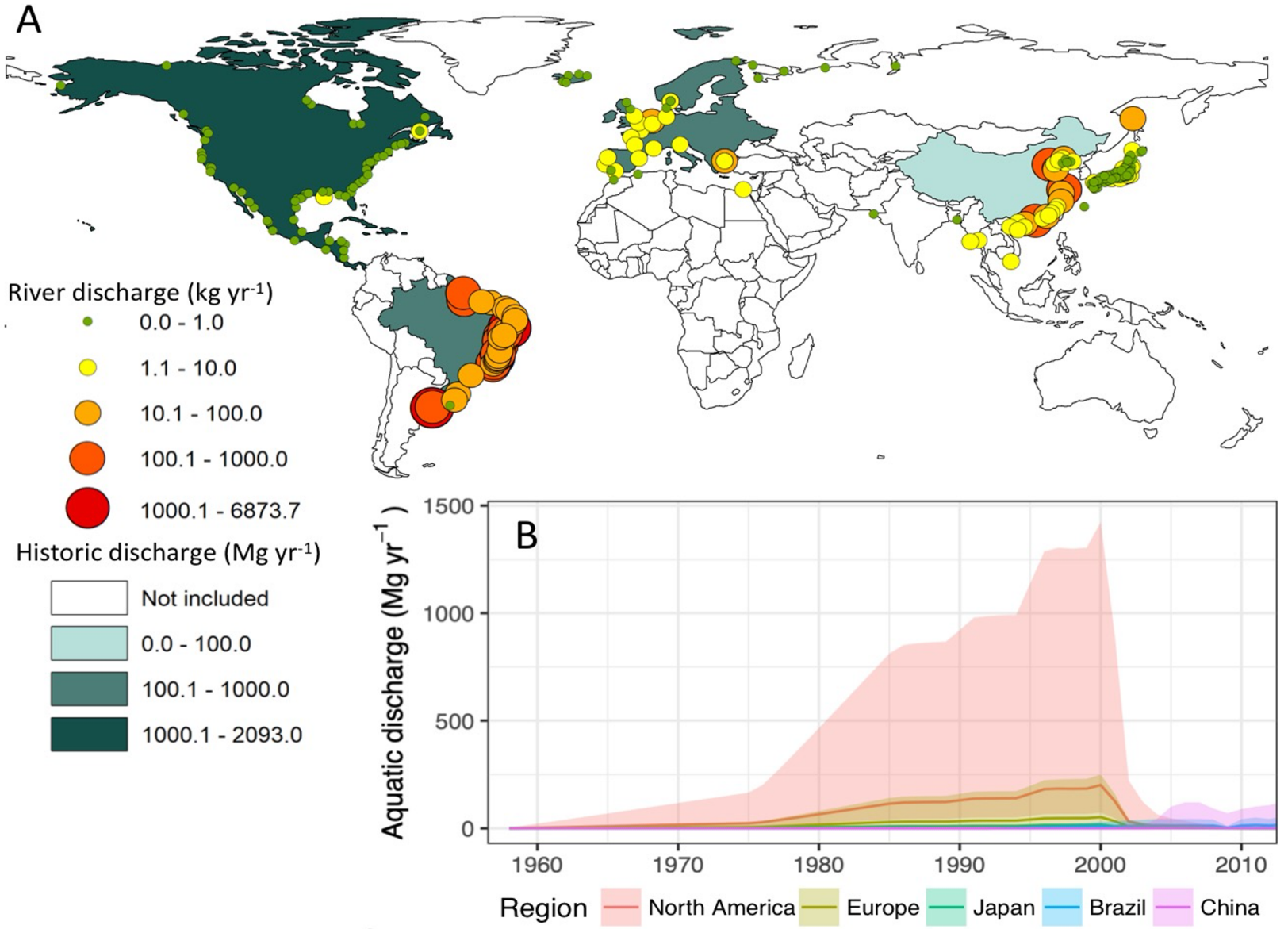


THE GOOD…

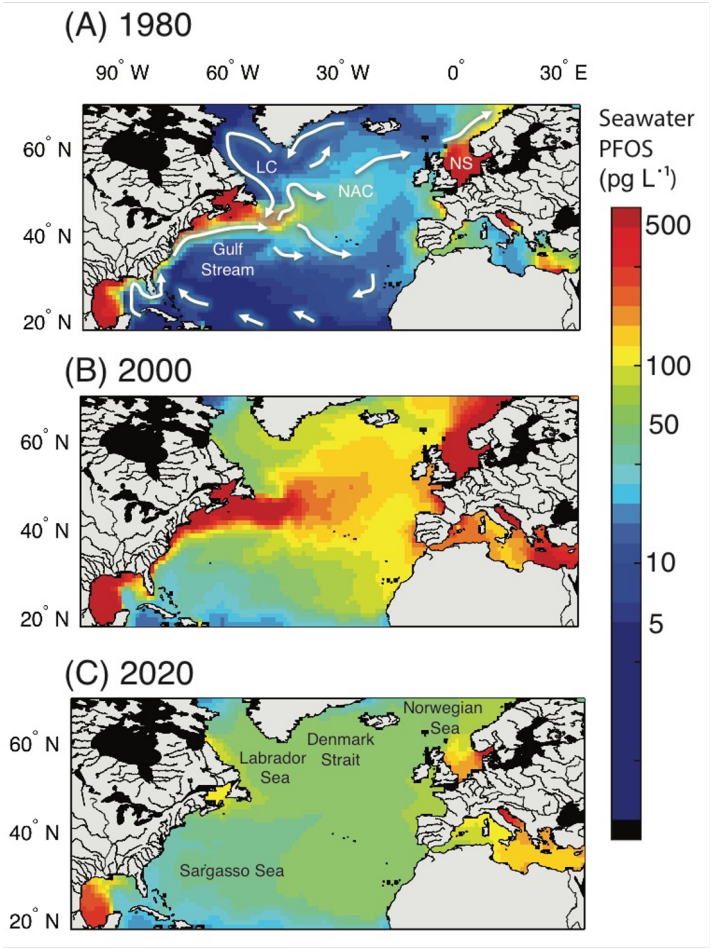
Phase out of POSF - parent chemical to PFOS + precursors ca. 2002 in NA/EUR and PFOA Stewardship Program very effective!



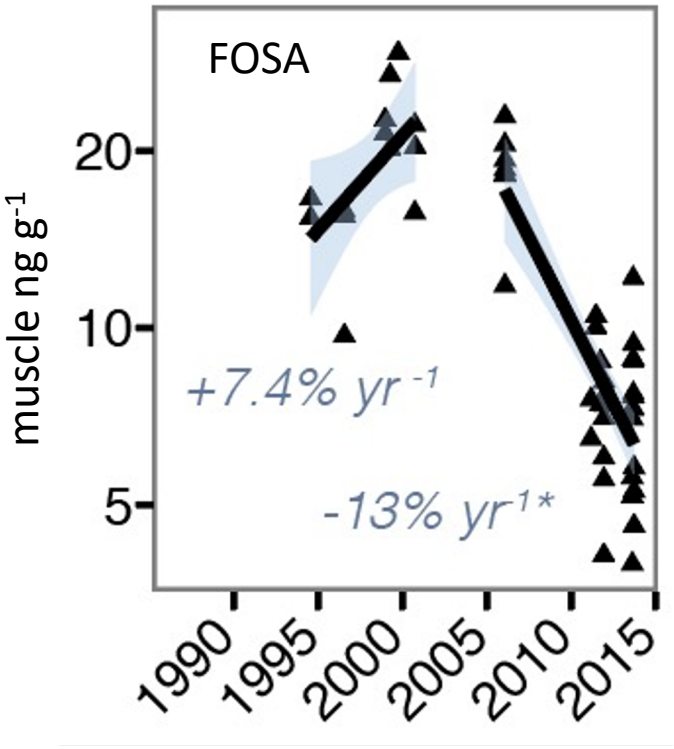
Wagner et al., in prep

Rapid declines in seawater, wildlife and humans following the phase-out

PFOS

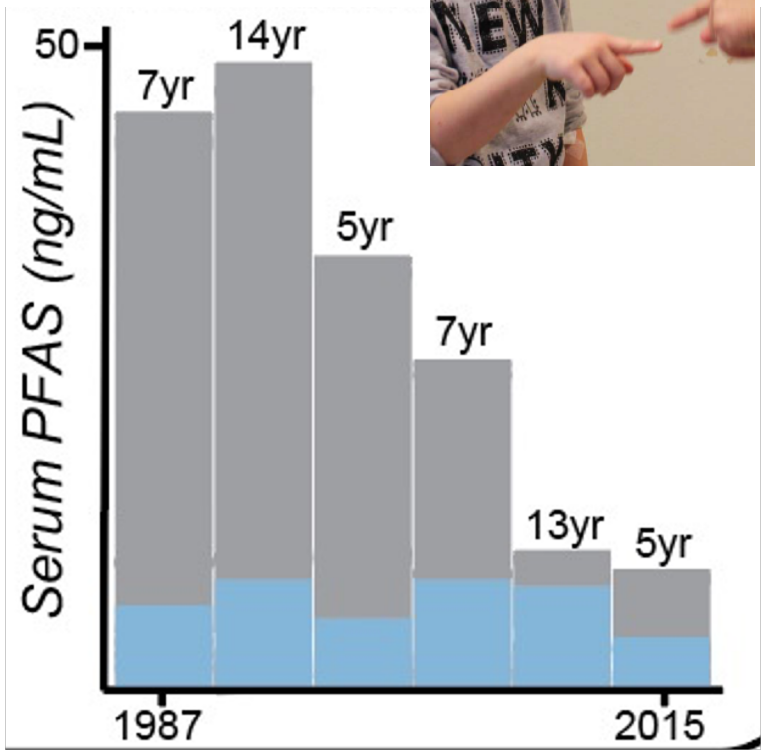


Zhang et al., 2017



Juvenile males 9-12 years

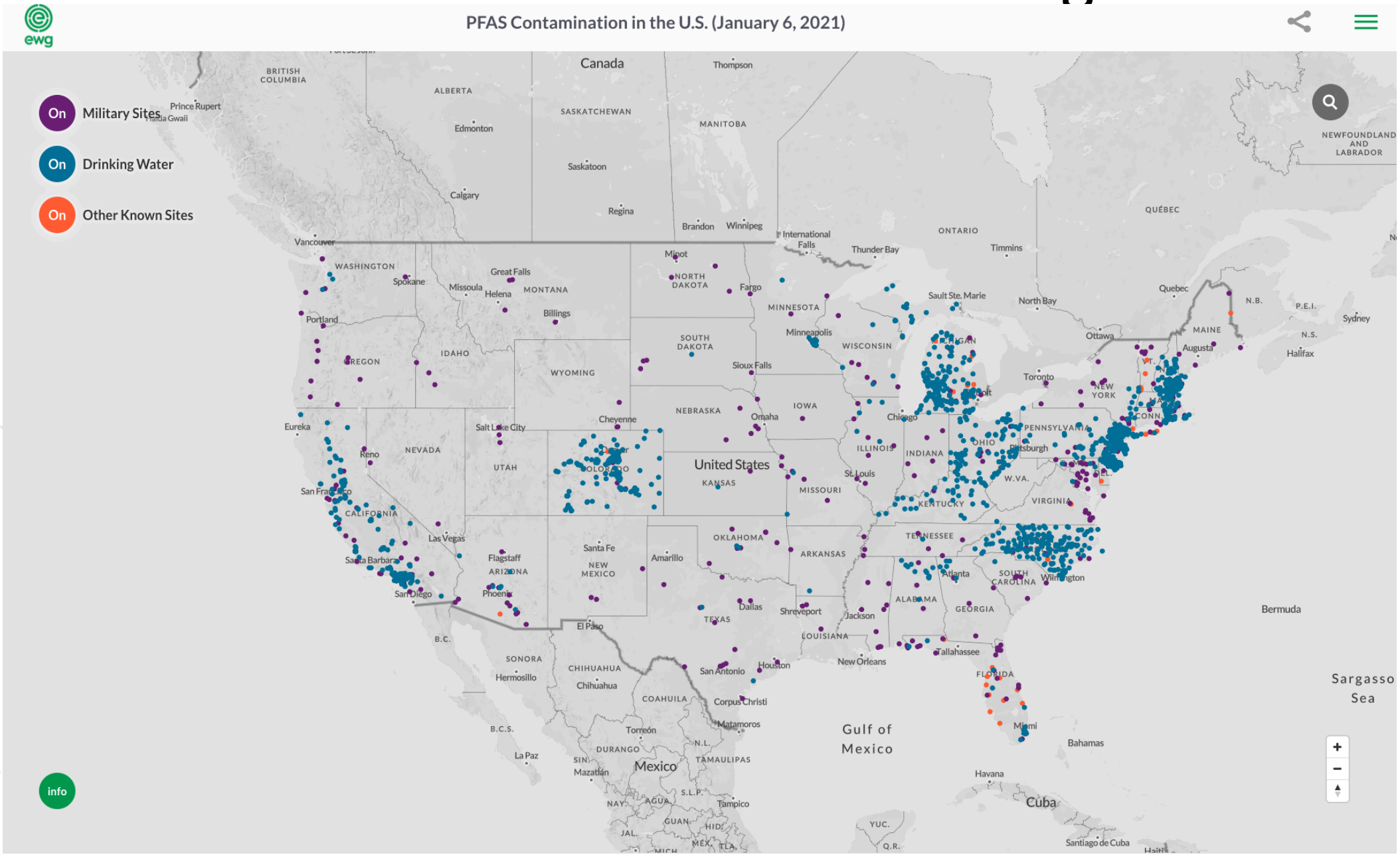
Dassuncao et al., 2017



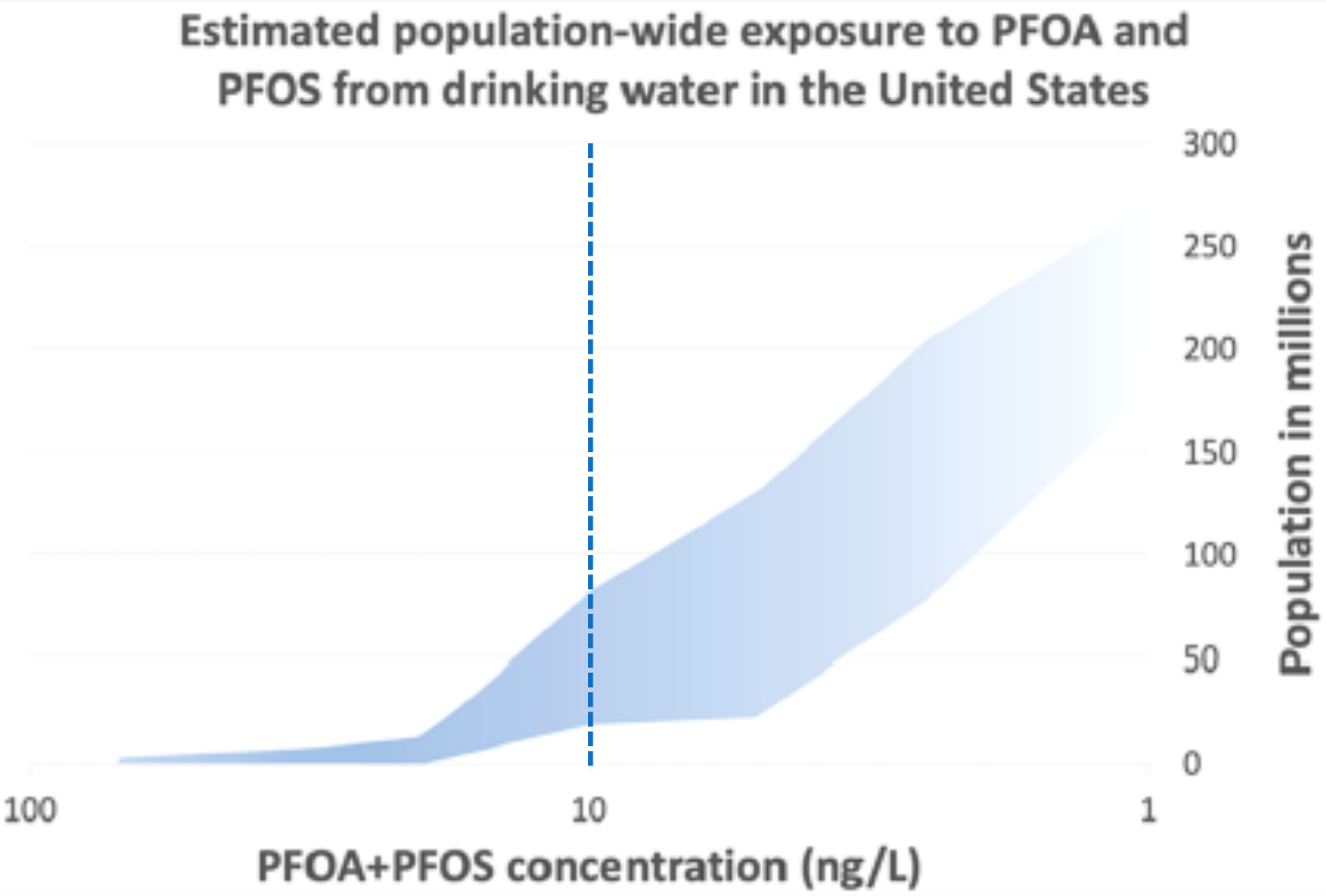
Dassuncao et al., 2018

THE BAD…

More and more contaminated sites are being discovered…

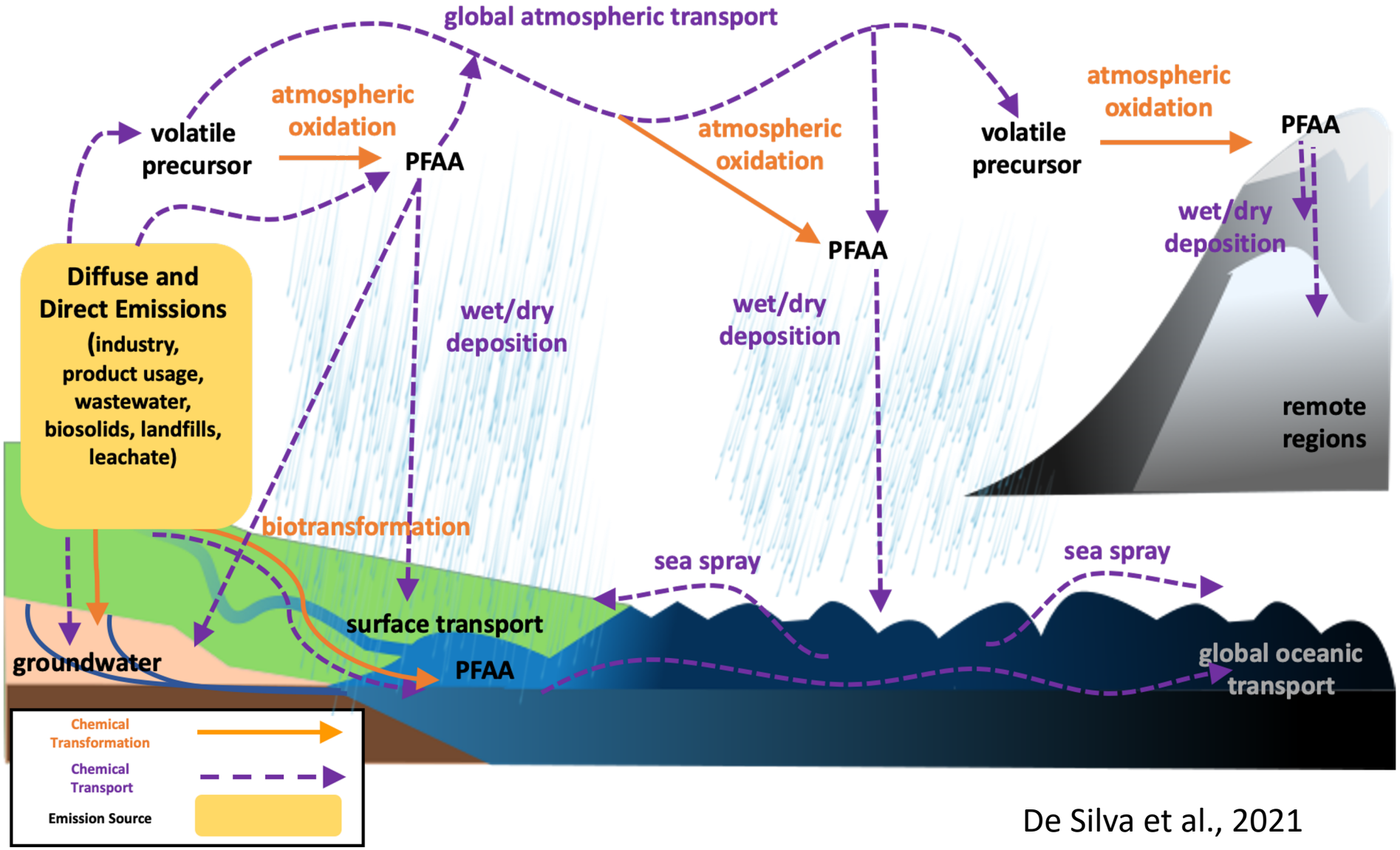


18-80 Million U.S. Residents have >10 ng/L PFAS in their tap water



Andrews and Naidenko, 2020, EST Letters

Atmospheric deposition of PFAS has been mainly overlooked but can be large next to point sources

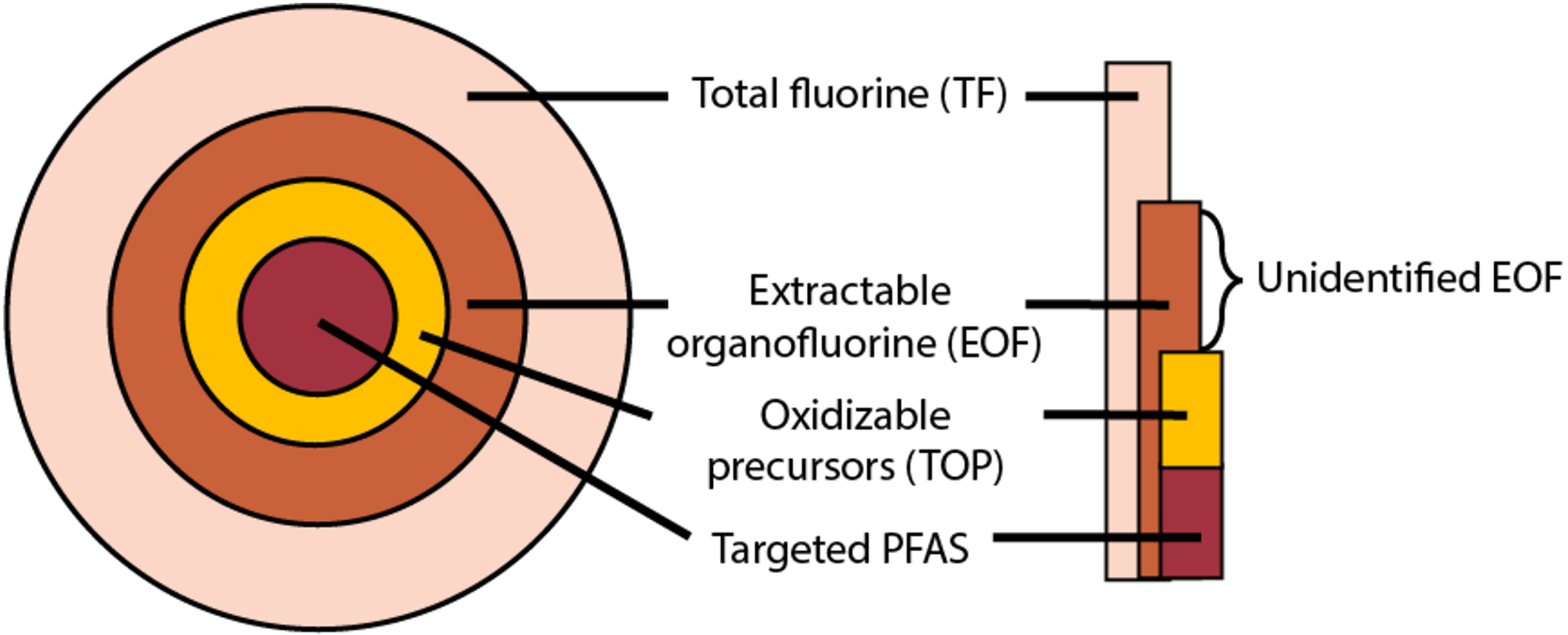


De Silva et al., 2021

THE UGLY…

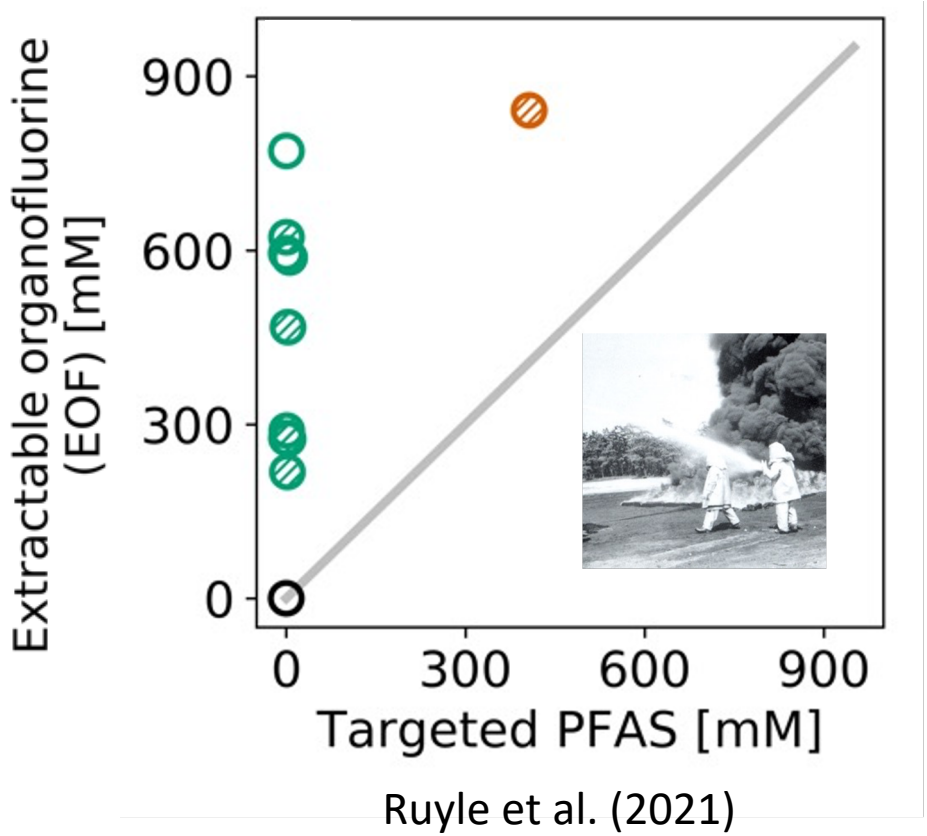
Most PFAS are not detected by targeted analysis (standard EPA methods)

Targeted analysis is usually limited to <50 PFAS with analytical standards



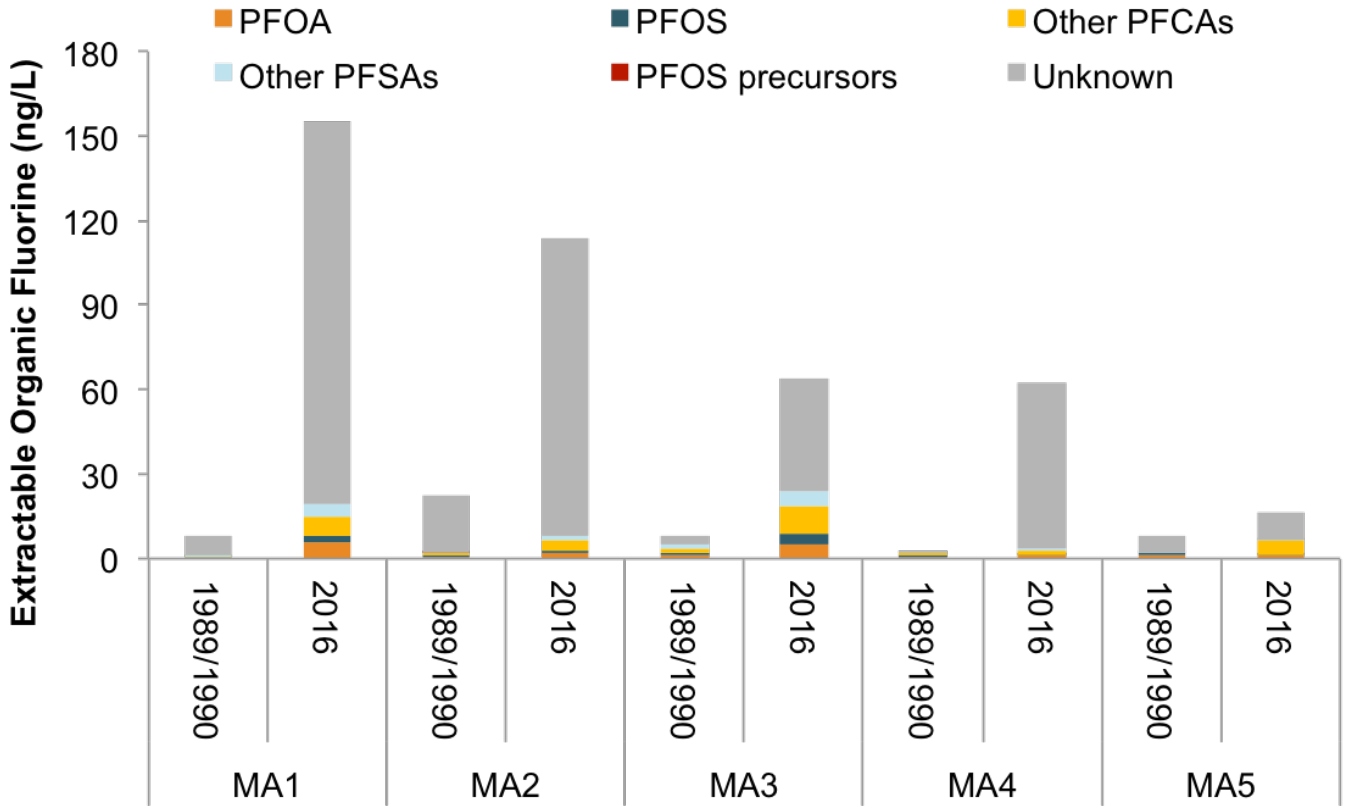
Large amounts of organofluorine in AFFF and drinking water

Fluorotelomer AFFF (2013-2017)



Ruyle et al. (2021)

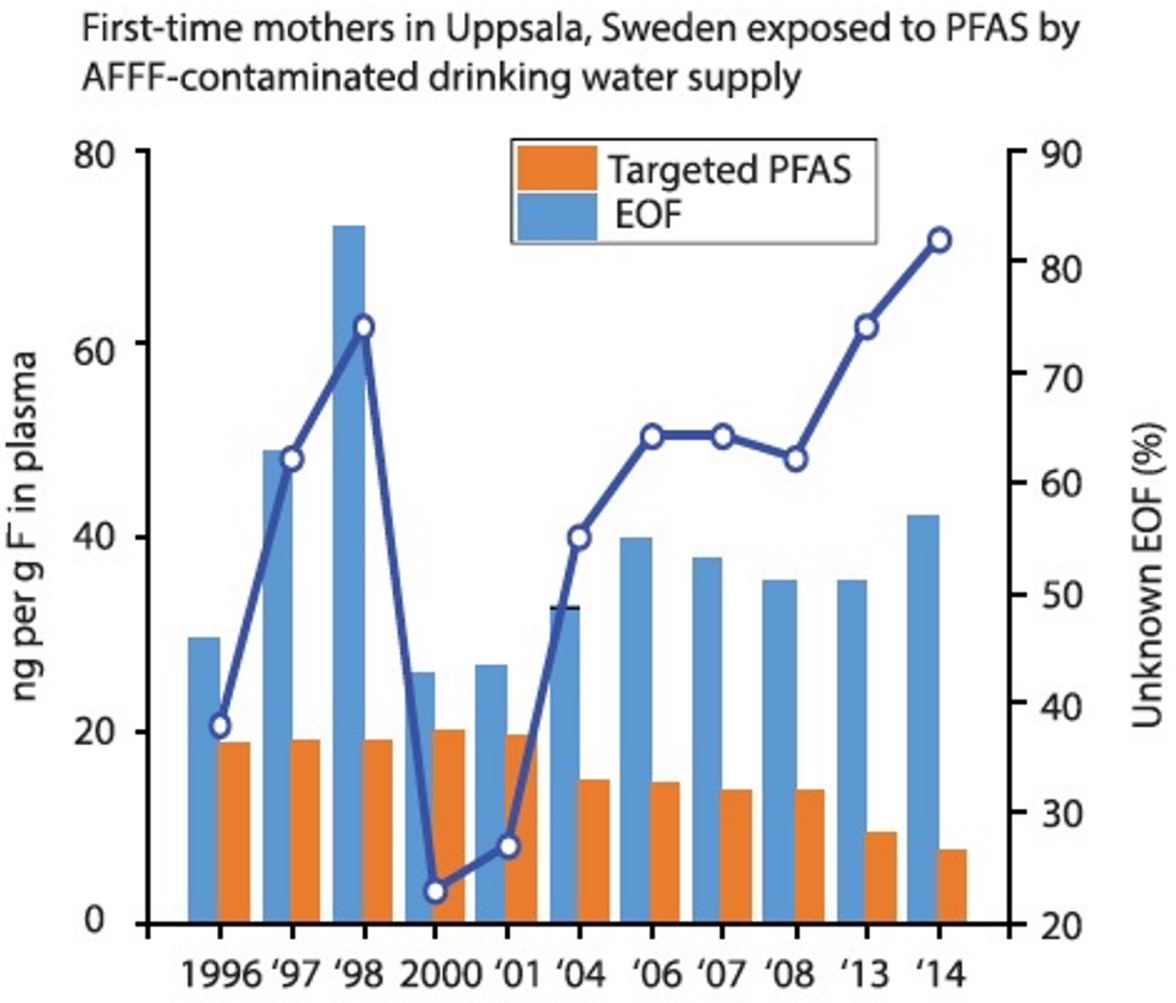
Pilot Data on Drinking Water in MA



% unknown EOF: 8% - 89% in 1989/1990; 60% - 94% in 2016

Hu et al. (2019)

Large amounts of organofluorine in human populations



Data from Miaz et al., 2020

PFBA exposure linked to COVID-19 severity

- Grandjean et al., 2020
- https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0244815