What do the UCMR5 PFAS results tell us that we wish we'd known earlier?

CA-NV AWWA PFAS Workgroup Meeting

February 7, 2024

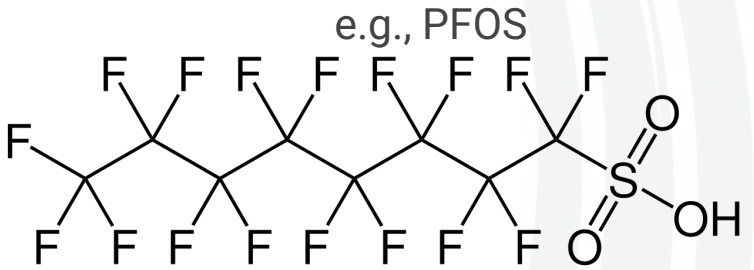
Chad Seidel, Ph.D., P.E.

Carleigh Samson , Ph.D., P.E.

Corona Environmental Consulting, LLC

PFAS in Drinking Water

- Per- and polyfluoroalkyl substances
- “Forever Chemicals”
- Brief (and incomplete) timeline of EPA’s recent “events”:



https://en.wikipedia.org/wiki/Per_and_polyfluoroalkyl_substances#/media/File:Perfluorooctanesulfonic_acid.svg

UCMR3 monitoring for 6 PFAS **2013-2015**

Updated **health advisory level** of 70 ppt for PFOA + PFOS **2016**

PFAS Action Plan **2019**

Final Regulatory Decision to Regulate PFOA & PFOS **March 2021**

Interim health advisories for PFOA (0.004 ppt), PFOS (0.02 ppt), GenX (10 ppt), PFBS (2,000 ppt) **June 2022**

Draft NPDWR including PFOA and PFOS MCLs and Health Index (HI) for GenX, PFBS, PFNA, and PFHxS **March 2023**

UCMR5 monitoring for 29 PFAS **2023-2025**

Final NPDWR expected by **end of 2024**

EPA's Draft PFAS Regulation

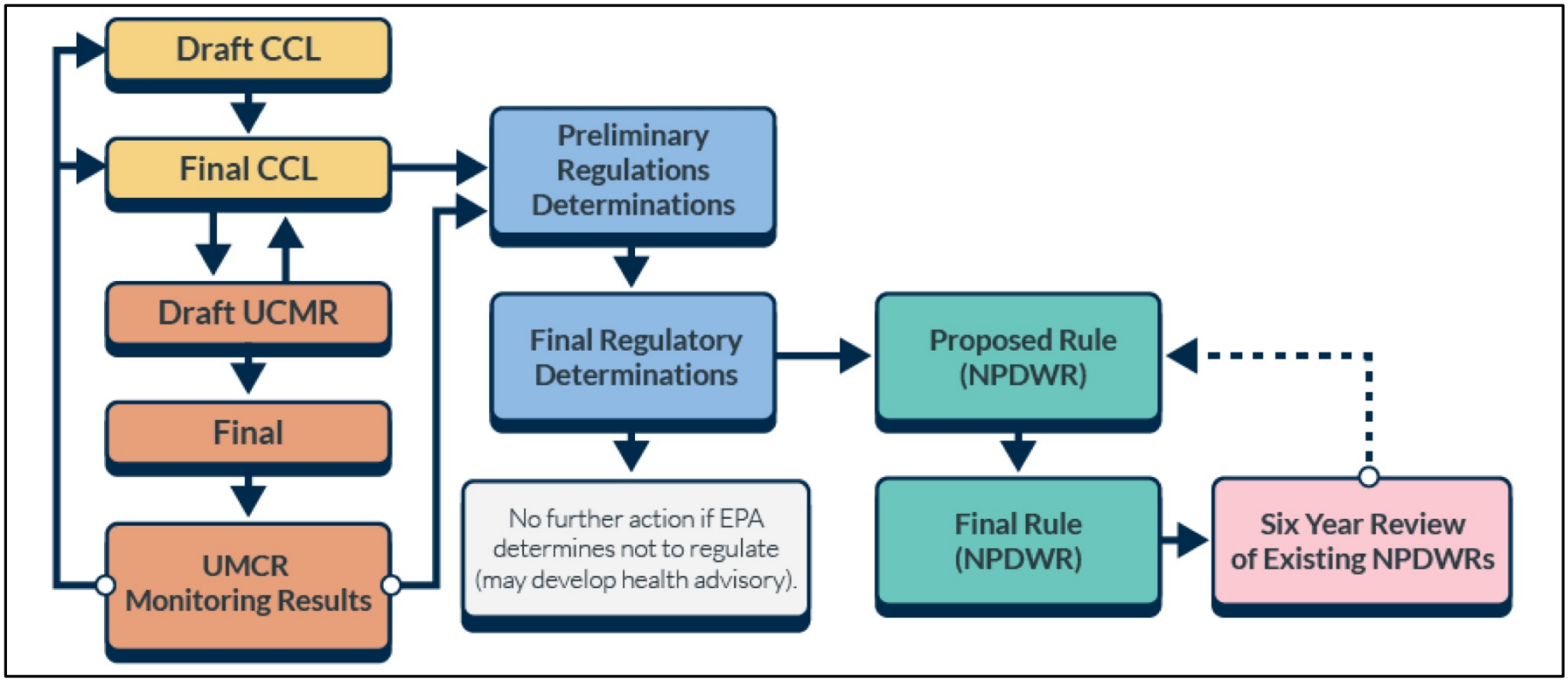
- Draft Regulation Summary:
  - PFOA MCL = 4 ppt (MCLG = 0)
  - PFOS MCL = 4 ppt (MCLG = 0)
  - Hazard Index (HI) where:

$$\frac{[PFHxS]}{RL{=}9\ ppt} + \frac{[GenX]}{RL{=}10\ ppt} + \frac{[PFNA]}{RL{=}10\ ppt} + \frac{[PFBS]}{RL{=}2{,}000\ ppt}$$ must be less than 1

Also considered 5 and 10 ppt

  - Applies to Community Water Systems (CWSs) and Non-Transient Non-Community Water Systems (NTNCWSs)
    - 66,667 active CWSs & NTNCWSs (2023 Q2 EPA SDWIS Inventory)

Figure 1. Simplified Process for Regulating Contaminants Under SDWA



Source: Modified by CRS from EPA.gov.

Notes: CCL = contaminant candidate list, UCMR = unregulated contaminant monitoring rule, NPDWR = national primary drinking water regulation.

Regulating Contaminants Under the Safe Drinking Water Act (SDWA)
Updated January 5, 2022, Congressional Research Service
https://crsreports.congress.gov/product/pdf/R/R46652

Assessing the Impact of the PFAS Reg

- Need occurrence data!
- Available national data sets:
  - UCMR3 (2013-2015)
  - AWWA WITAF 057 (2013-2021)
  - Cadwallader et al. 2022 (2016-2021)
  - UCMR5 (2023-2025)
- Overarching questions:
  - Are these data sets nationally representative?
  - What do these data sets tell us about national PFAS occurrence?

PFAS Occurrence Data Sets

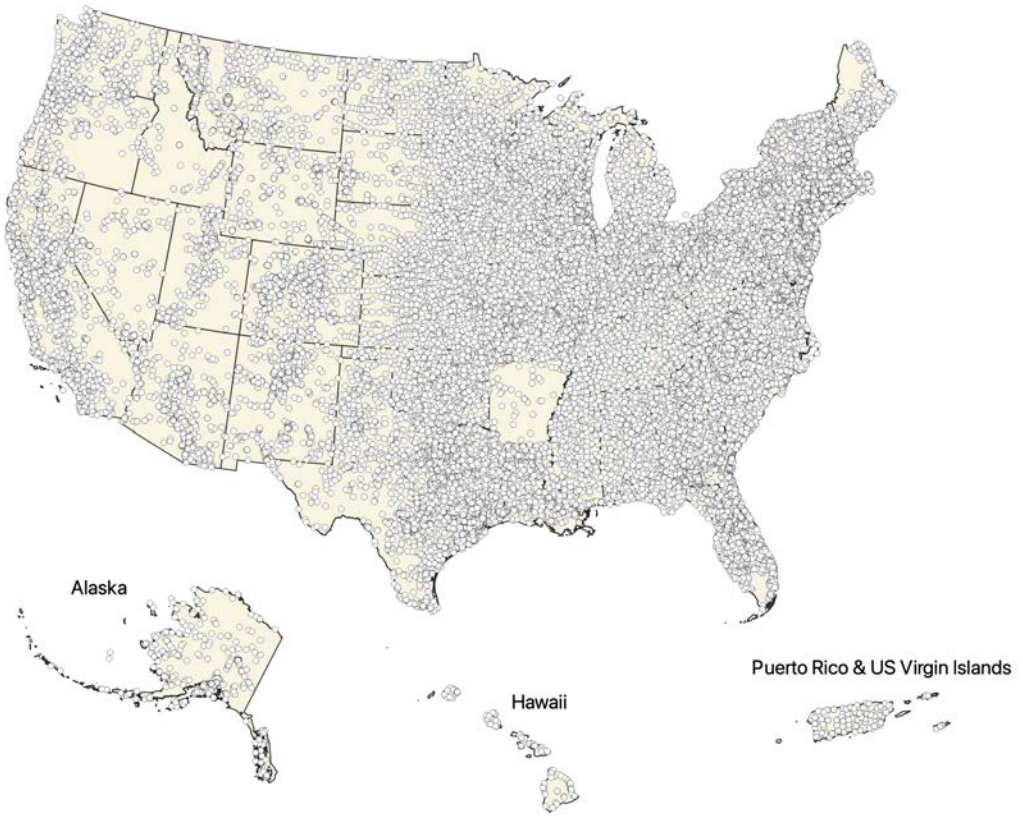
Data Set	No. of Data Records	No. of States	No. of PWS	No. of Facilities	No. of Sample Points
UCMR3	182,969	50+	4,843	15,032	14,789
WITAF 057	89,315	23	3,422	4,422	7,888
Cadwallader	18,415	17	768	798	1,980
UCMR5	TBD	50+	10,498	TBD	TBD

PFAS Occurrence Data Outcomes

Data Set	No. of PWSs w/ Data	No. (%) of PWSs w/ PFOA > 4 ppt	No. (%) of PWSs w/ PFOS > 4 ppt	No. (%) of PWSs w/ HI > 1	No. (%) of PWSs w/ Draft NPDWR MCL Exceedance
UCMR3	4,843	117 (2.4%)	94 (1.9%)	N/A	161 (3.3%)
WITAF 057	3,422	764 (22.4%)	615 (18.0%)	296 (8.6%)	873 (25.5%)
Cadwallader et al. 2022	768	206 (26.8%)	175 (22.8%)	N/A	227 (29.6%)

Occurrence Data By Geography/State

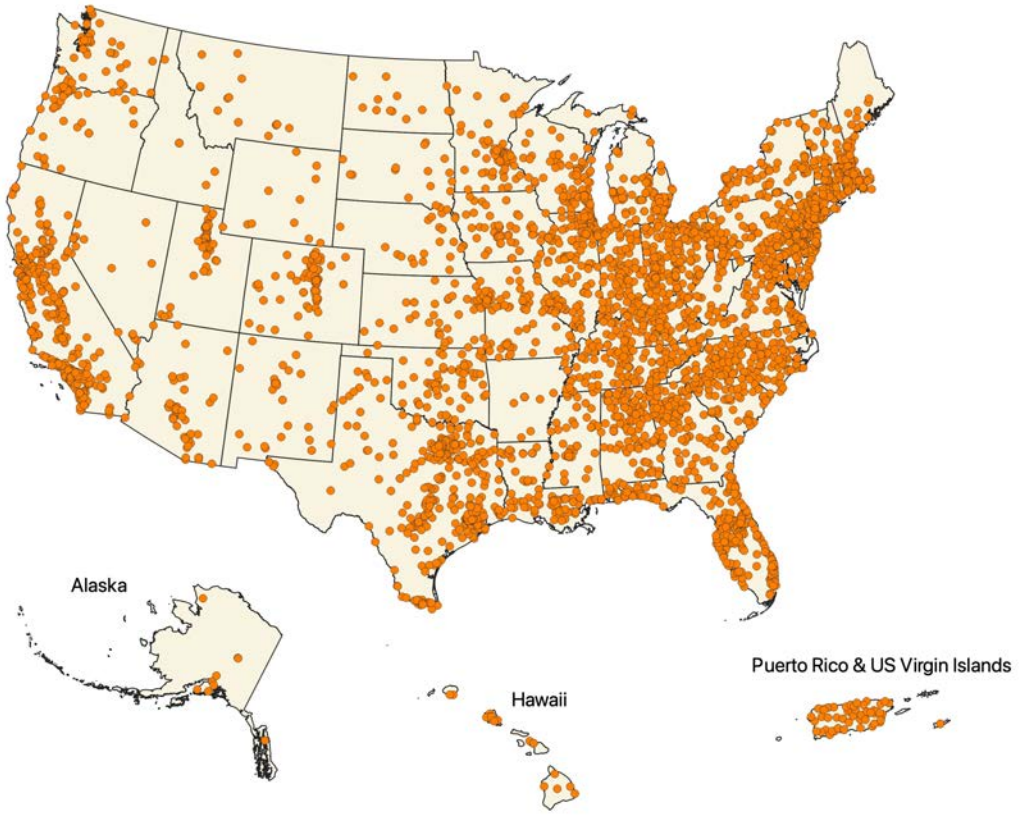
- All CWSs & NTNCWSs



Occurrence Data By Geography/State

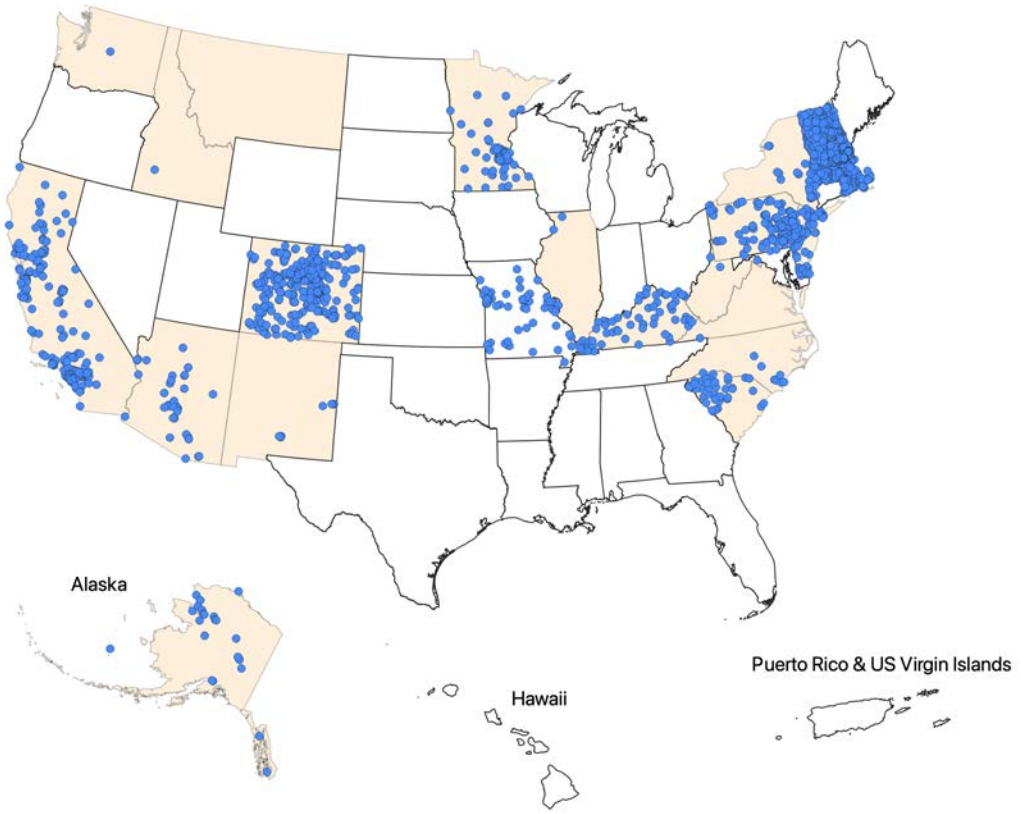
- CWSs & NTNCWSs w/ data in UCMR3

Reporting Limits:
- PFOA – 20 ppt
- PFOS – 40 ppt



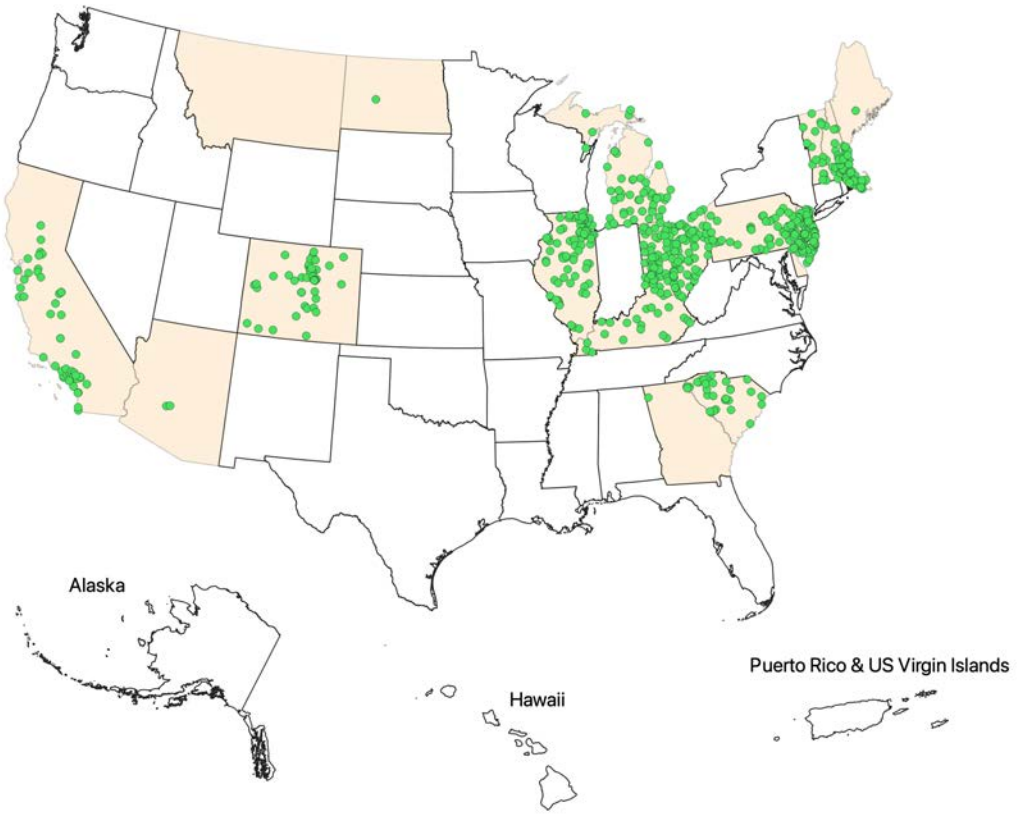
Occurrence Data By Geography/State

- CWSs & NTNCWSs w/ data in WITAF 057 (“state data”)



Occurrence Data By Geography/State

- CWSs & NTNCWSs w/ data in Cadwallader et al. 2022

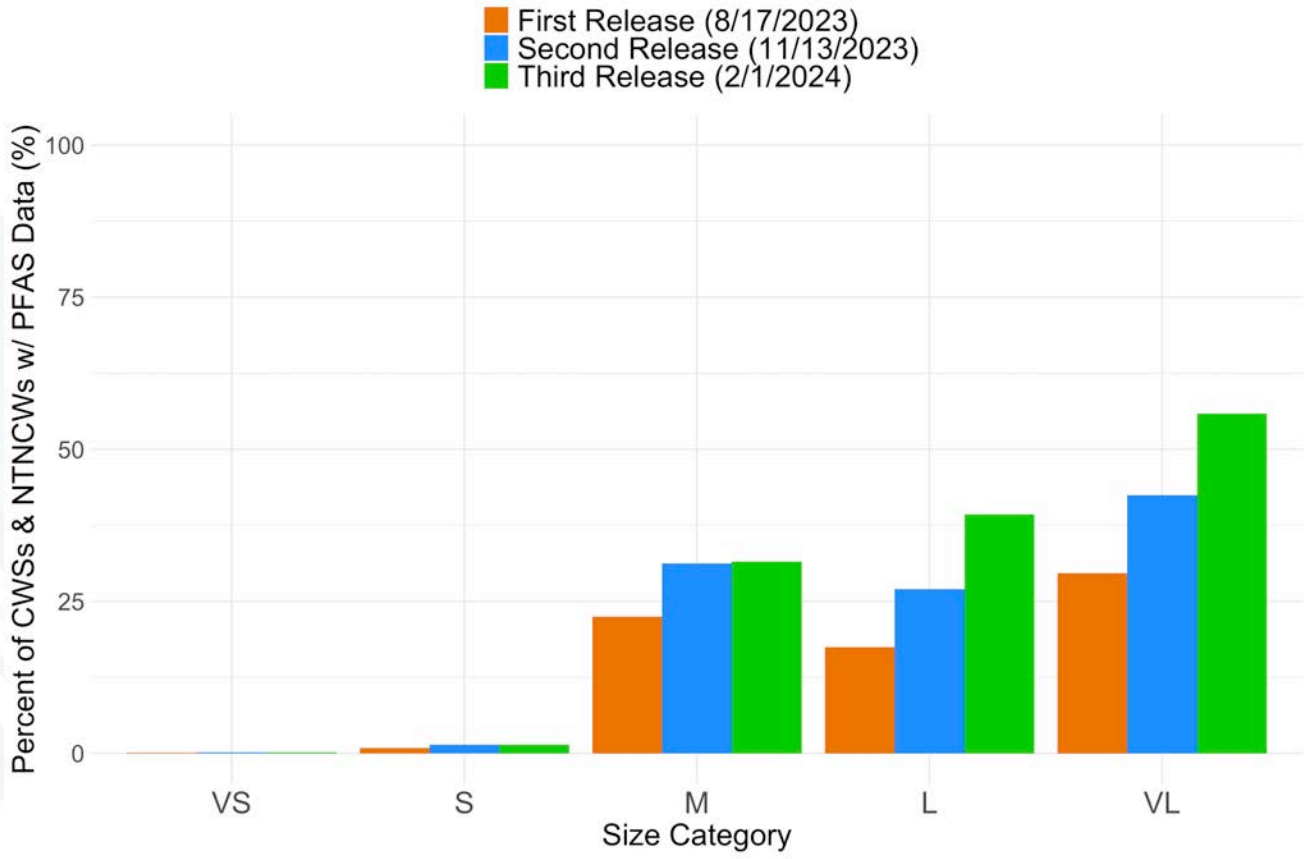


UCMR5 Data Reporting

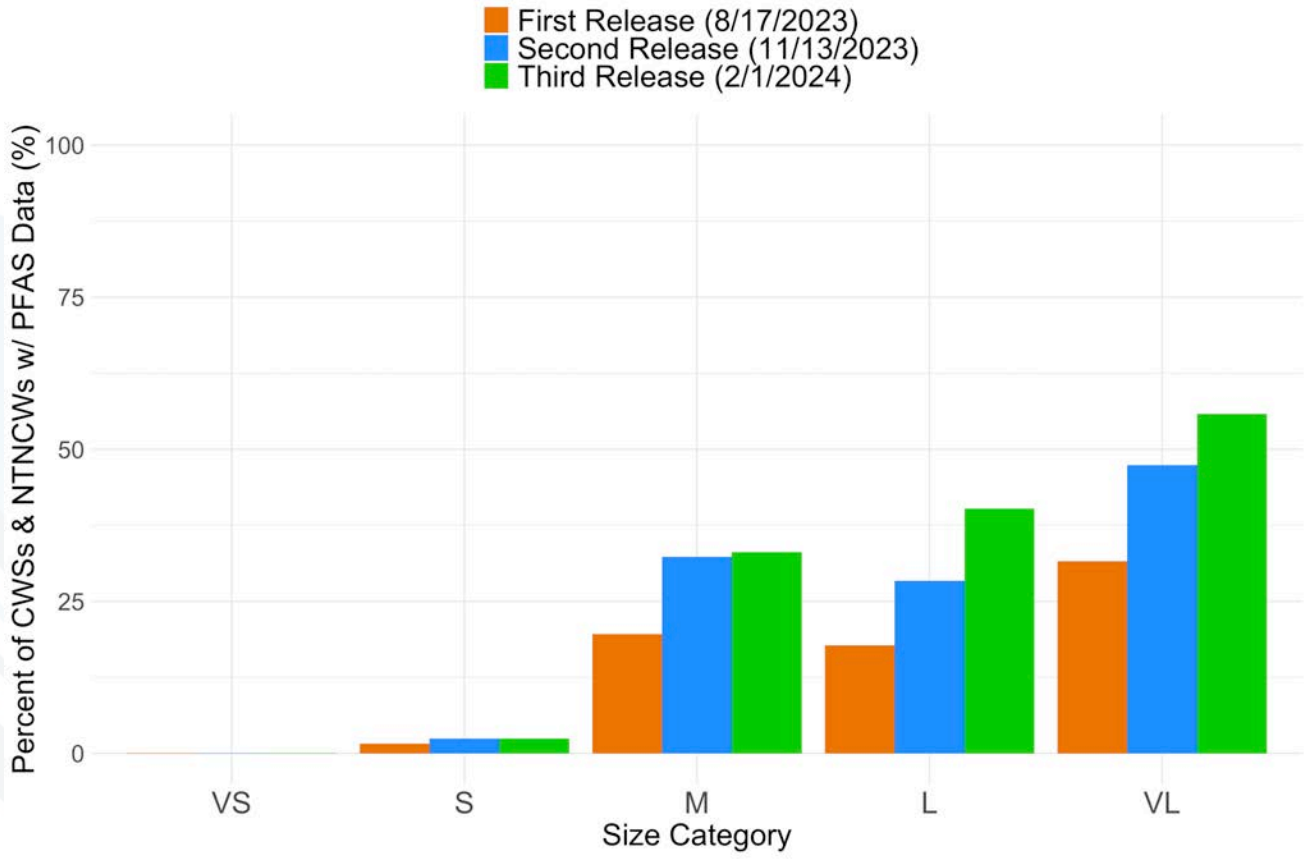
	1st Release (8/17/2023)	2nd Release (11/13/2023)	3rd Release (2/1/2024)
No. of PWSs	2,282	3,239	3,804
PWSs w/ PFAS data	2,193	3,197	3,782
PWSs w/ EPA 533 PFAS data	2,003	3,076	3,725
PWSs w/ lithium data	3,767	2,236	3,214
PWSs w/ detected lithium	681 (30%)	1,089 (34%)	1,320 (35%)
PWSs w/ PFAS data exceeding draft regulations	219 (11% of PWSs w/ EPA 533 PFAS data)	419 (14% of PWSs w/ EPA 533 PFAS data)	597 (16% of PWSs w/ EPA 533 PFAS data)

- Once finished, UCMR5 should include 10,498 PWSs
  - If **all** CWSs & NTNCWSs serving >3,300 + 800 smaller systems report data
  - To date, 35% of expected PWSs have reported EPA 533 PFAS data

Data Representativeness by System Size: Nationwide

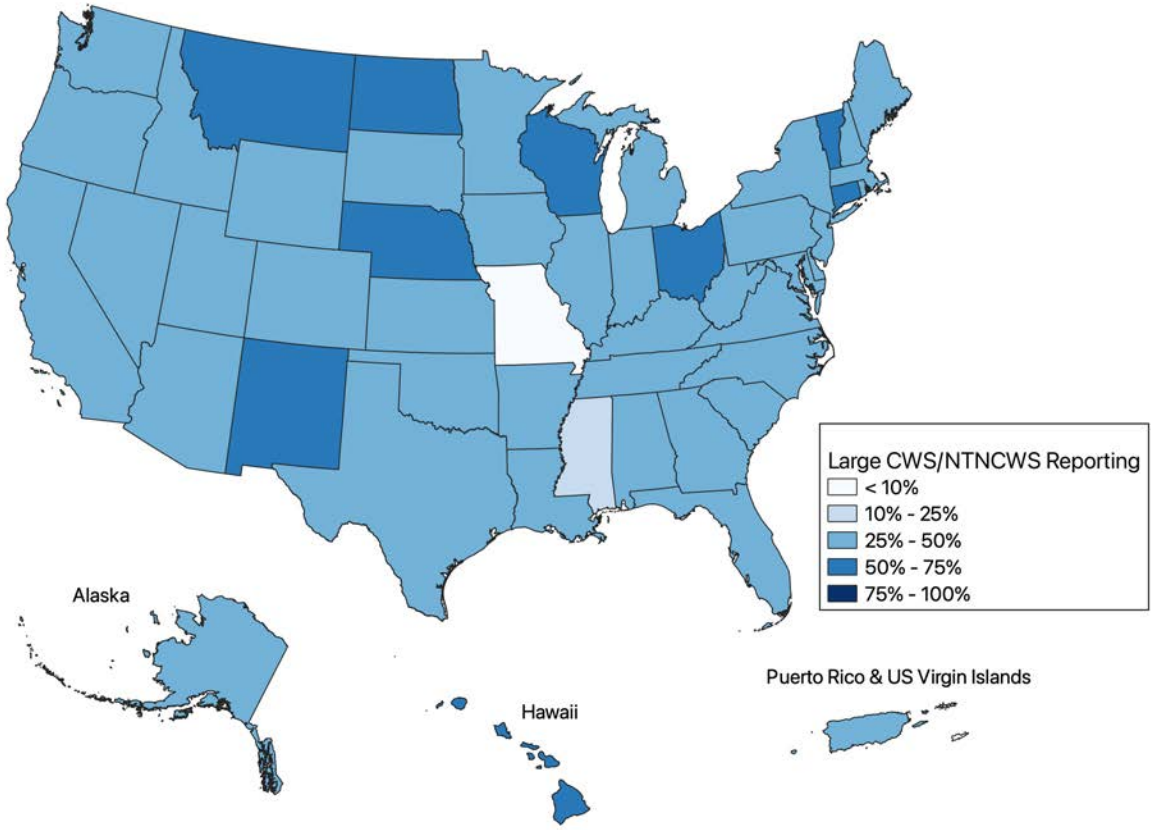


Data Representativeness by System Size: CA/NV Only



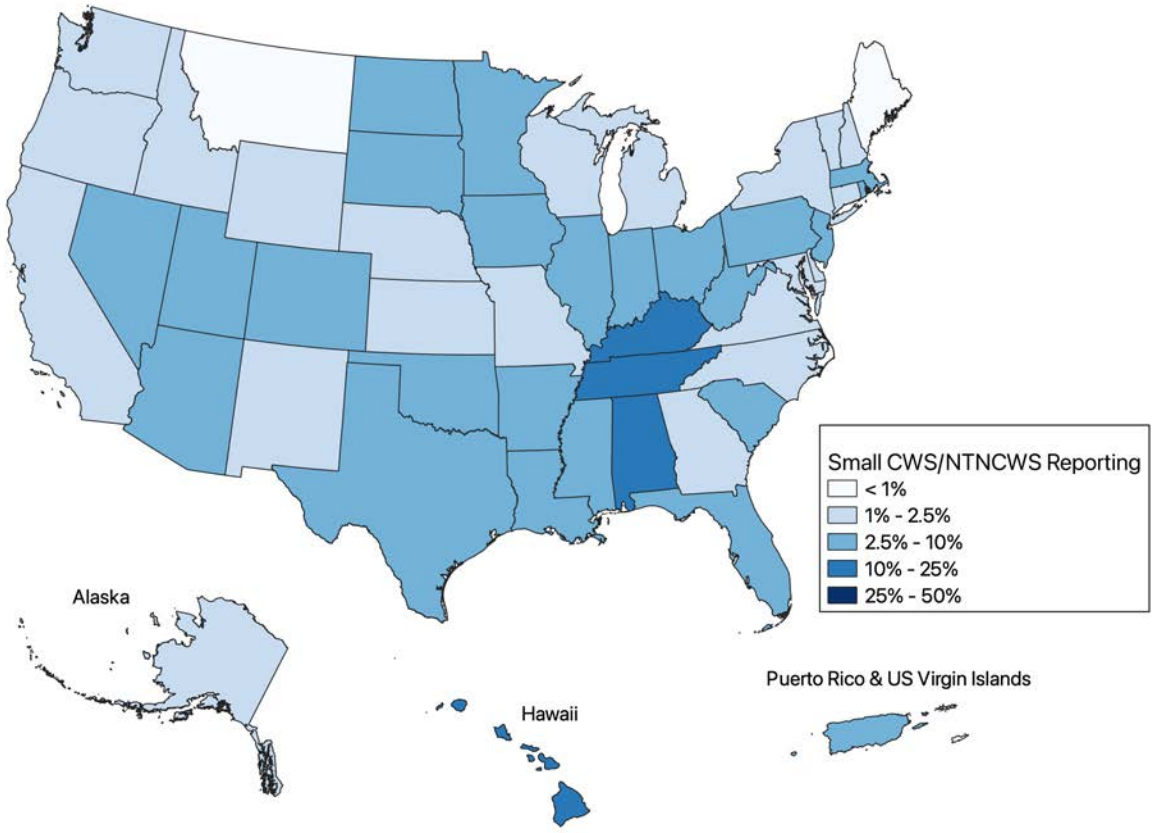
Occurrence Data By Geography/State

- UCMR5 Large Systems Data Reporting

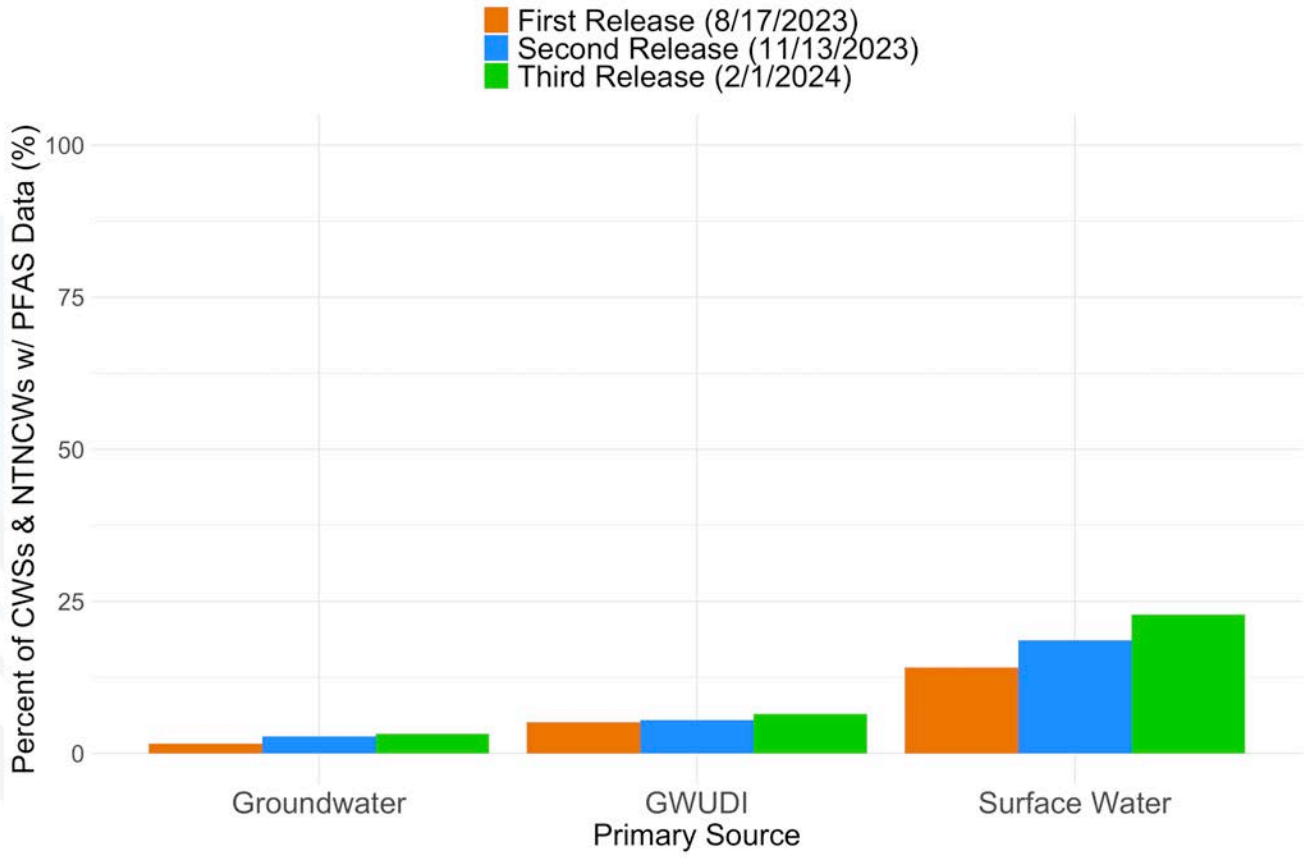


Occurrence Data By Geography/State

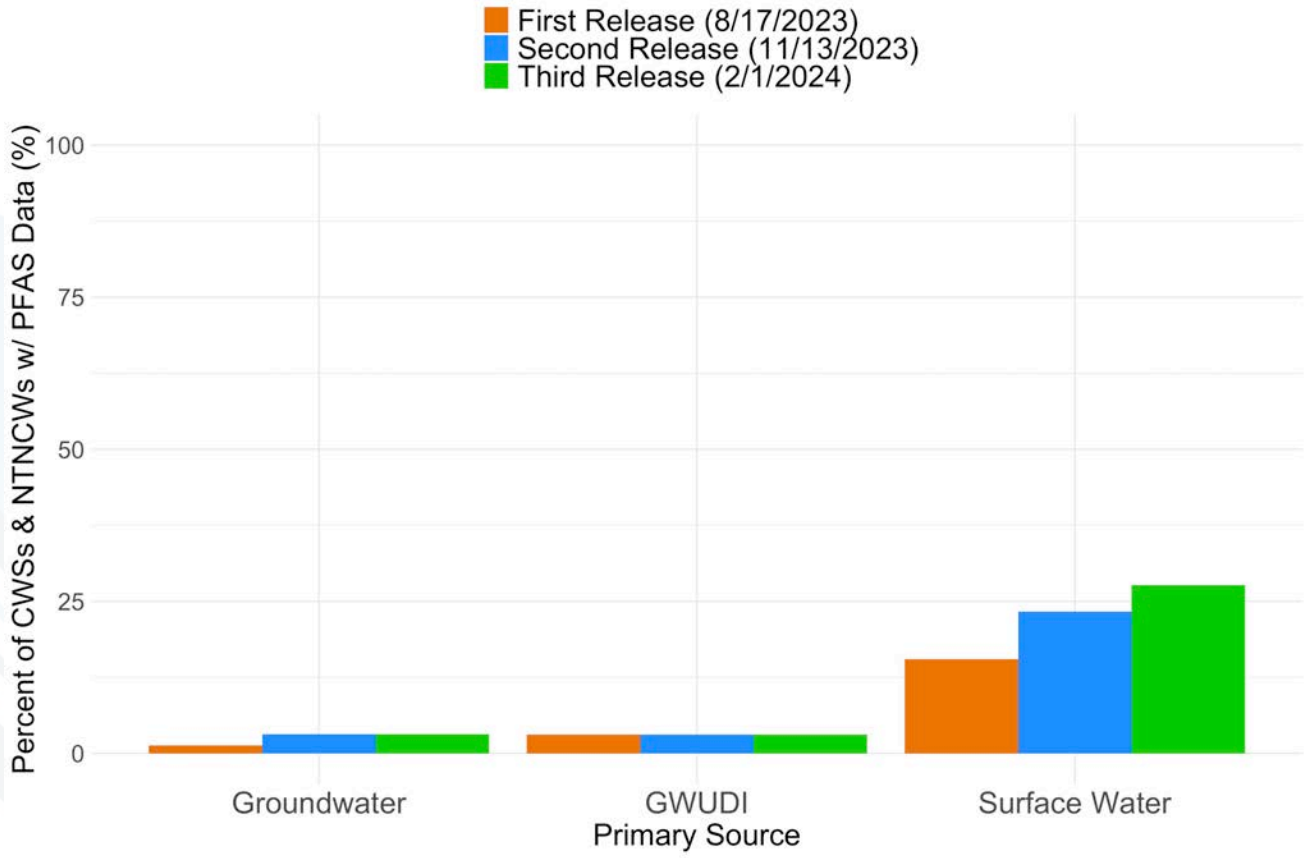
- UCMR5 Small Systems Data Reporting



Data Representativeness by Primary Source: Nationwide



Data Representativeness by Primary Source: CA/NV Only



Comparing National PFAS Data Summaries

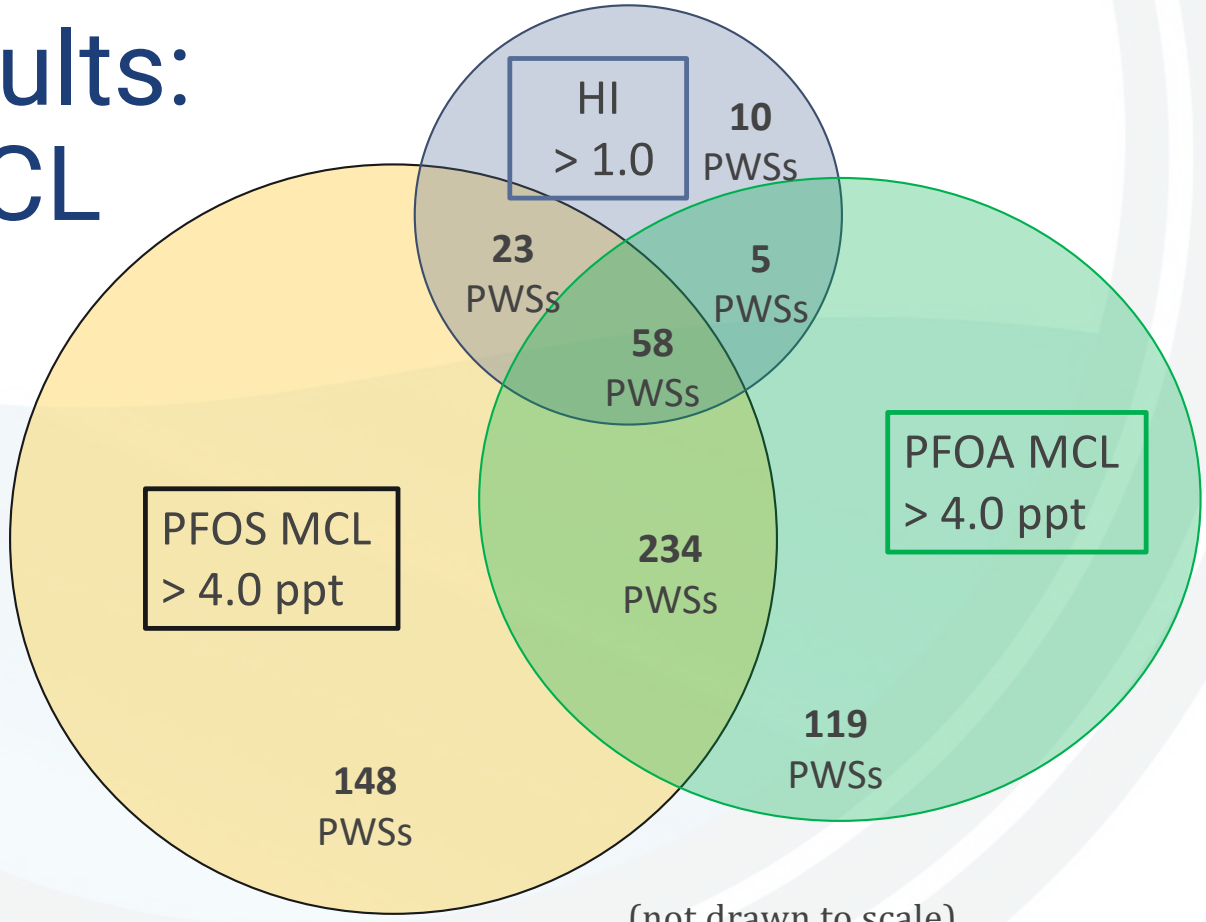
	Count of PWSs…	First Release (8/17/2023)	Second Release (11/13/2023)	Third Release (2/1/2024)
	Reporting (EPA 533)	2,003	3,074	3,725
Detections	w/ any detected PFAS	431 (21.5%)	582 (18.9%)	1,246 (33.4%)
	w/ PFOA detect	156 (7.8%)	293 (9.5%)	430 (11.5%)
	w/ PFOS detect	170 (8.5%)	330 (10.7%)	478 (12.8%)
	w/ HI > 0	199 (9.9%)	290 (9.4%)	424 (11.4%)
Draft Reg Exceeds	w/ PFOA > 4 ppt	152 (7.6%)	283 (9.2%)	417 (11.1%)
	w/ PFOS > 4 ppt	164 (8.2%)	323 (10.5%)	464 (12.5%)
	w/ HI > 1	30 (1.5%) *Only 6 of these PWSs do not have PFOA or PFOS > MCL	61 (2.0%) *Only 8 of these PWSs do not have PFOA or PFOS > MCL	96 (2.6%) *Only 10 of these PWSs do not have PFOA or PFOS > MCL
	w/ any MCL exceedance	219 (10.9%)	418 (13.6%)	597 (16.1%)

Comparing CA/NV PFAS Data Summaries

	Count of PWSs…	First Release (8/17/2023)	Second Release (11/13/2023)	Third Release (2/1/2024)
	Reporting (EPA 533)	142	256	313
Detections	w/ any detected PFAS	20 (14.1%)	48 (18.8%)	70 (22.4%)
	w/ PFOA detect	14 (9.9%)	31 (12.1%)	45 (14.4%)
	w/ PFOS detect	16 (11.3%)	35 (13.7%)	49 (15.7%)
	w/ HI > 0	17 (12.0%)	43 (16.8%)	62 (19.8%)
Draft Reg Exceeds	w/ PFOA > 4 ppt	14 (9.9%)	29 (11.3%)	44 (14.1%)
	w/ PFOS > 4 ppt	16 (11.3%)	35 (13.7%)	48 (15.3%)
	w/ HI > 1	4 (2.8%) *PFOA or PFOS > MCL for all these PWSs	6 (2.3%) *PFOA or PFOS > MCL for all these PWSs	14 (4.5%) *PFOA or PFOS > MCL for all these PWSs
	w/ any MCL exceedance	18 (12.7%)	39 (15.2%)	55 (17.9%)

Focusing on UCMR5 Results: Potential MCL Violations

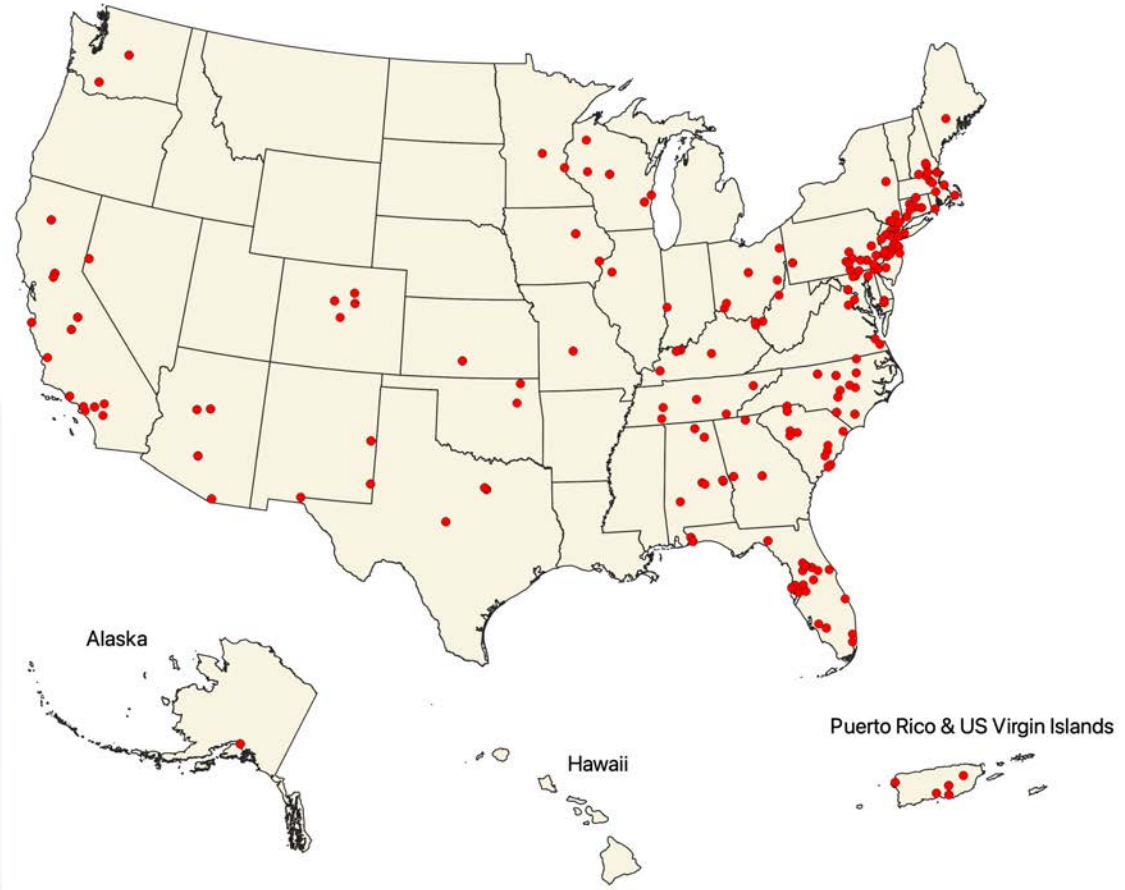
- Based on PWS max PFOA, PFOS, and HI for PWSs with UCMR5 data exceeding EPA Draft Regulations



(not drawn to scale)

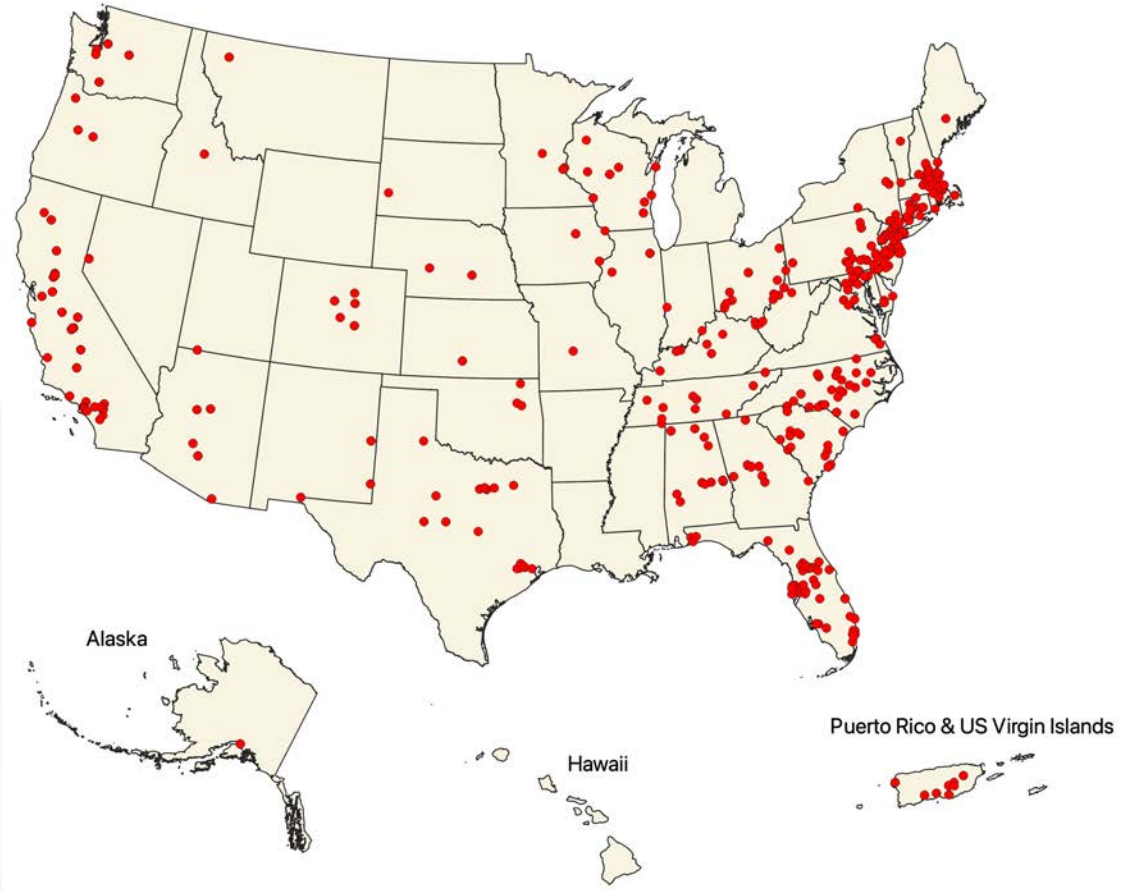
PWSs w/ Reg Exceedance (4 ppt MCL)

- **First data release** (8/17/2023)
- 219 PWSs w/ exceedances of EPA's Draft PFAS Reg
  - PFOA or PFOS > MCL of **4 ppt**, or
  - HI index > 1
- 18 of these PWSs in CA/NV



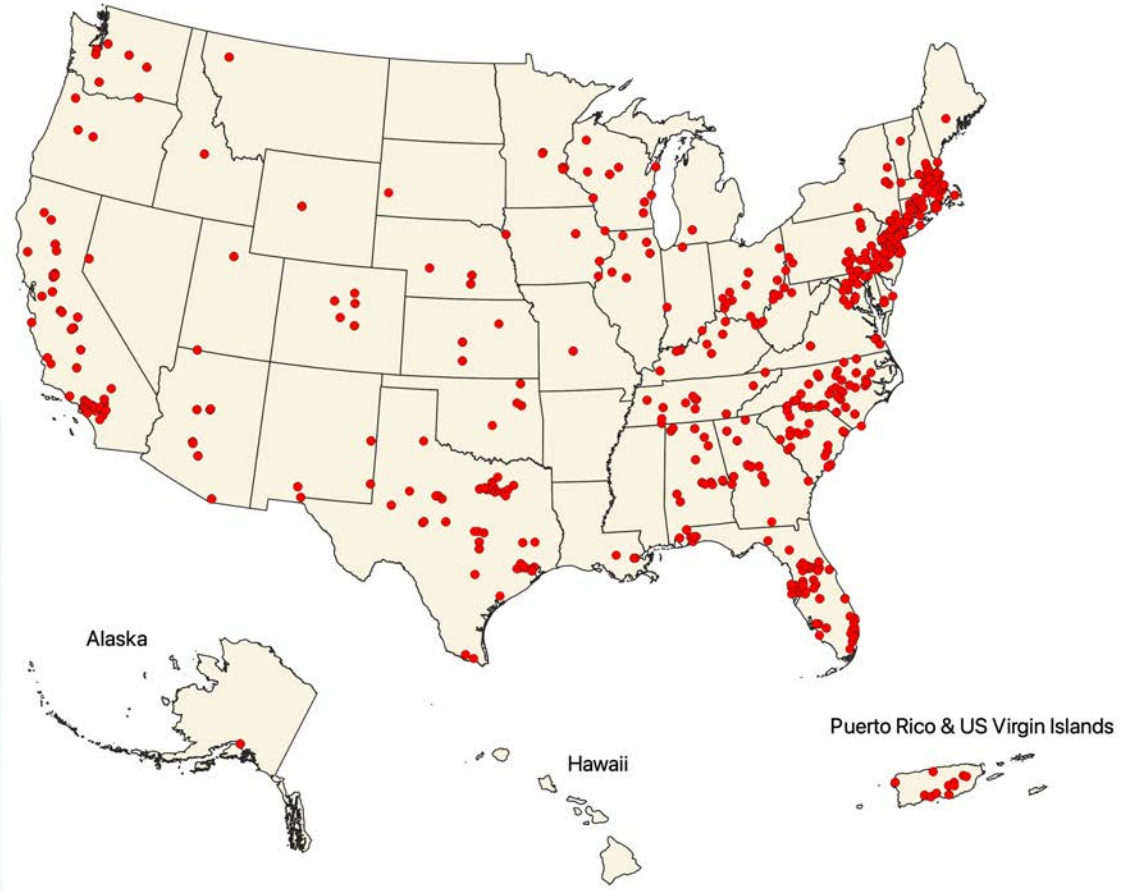
PWSs w/ Reg Exceedance (4 ppt MCL)

- **Second data release** (11/13/2023)
- 418 PWSs w/ exceedances of EPA's Draft PFAS Reg
  - PFOA or PFOS > MCL of **4 ppt**, or
  - HI index > 1
- 39 of these PWSs in CA/NV



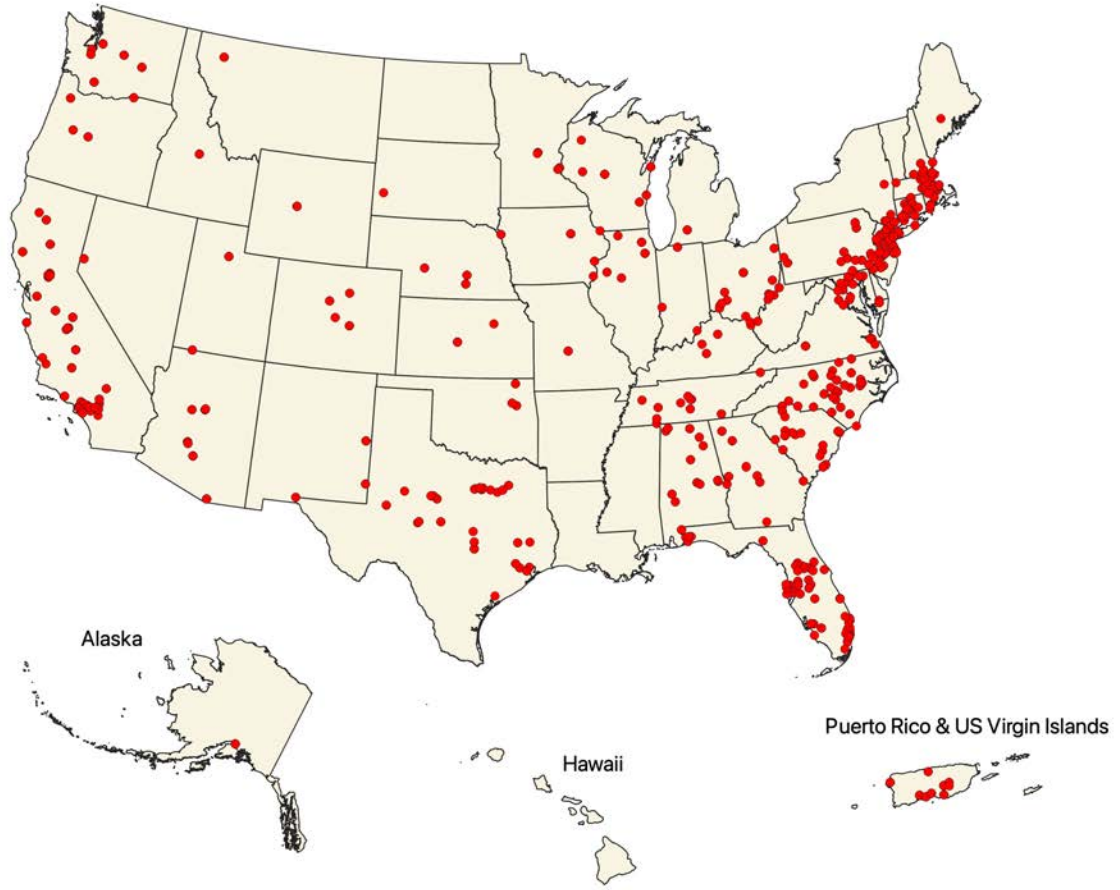
PWSs w/ Reg Exceedance (4 ppt MCL)

- **Third data release** (2/1/2024)
- 597 PWSs w/ exceedances of EPA's Draft PFAS Reg
  - PFOA or PFOS > MCL of **4 ppt**, or
  - HI index > 1
- 55 of these PWSs in CA/NV



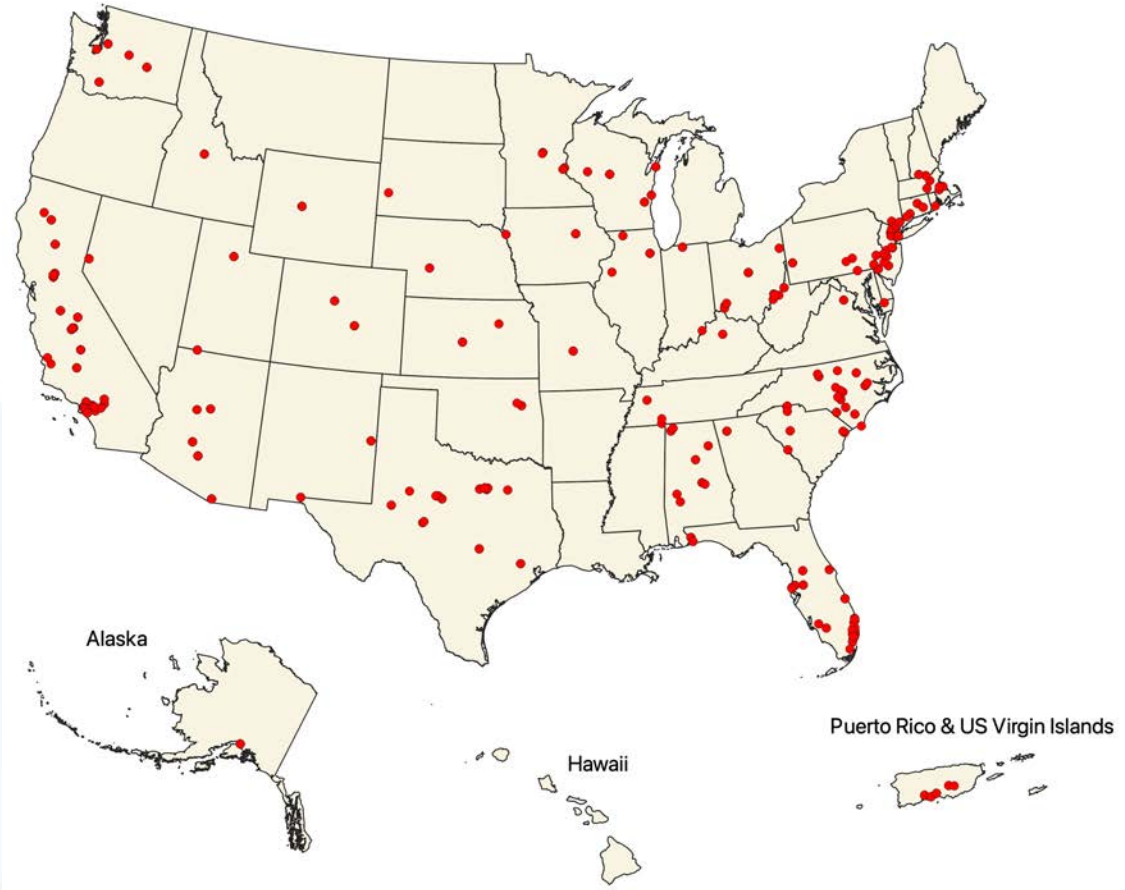
PWSs w/ Reg Exceedance (5 ppt MCL)

- **Third data release** (2/1/2024)
- 480 PWSs w/ exceedances of EPA's Draft PFAS Reg
  - PFOA or PFOS > MCL of **5 ppt**, or
  - HI index > 1
- 47 of these PWSs in CA/NV



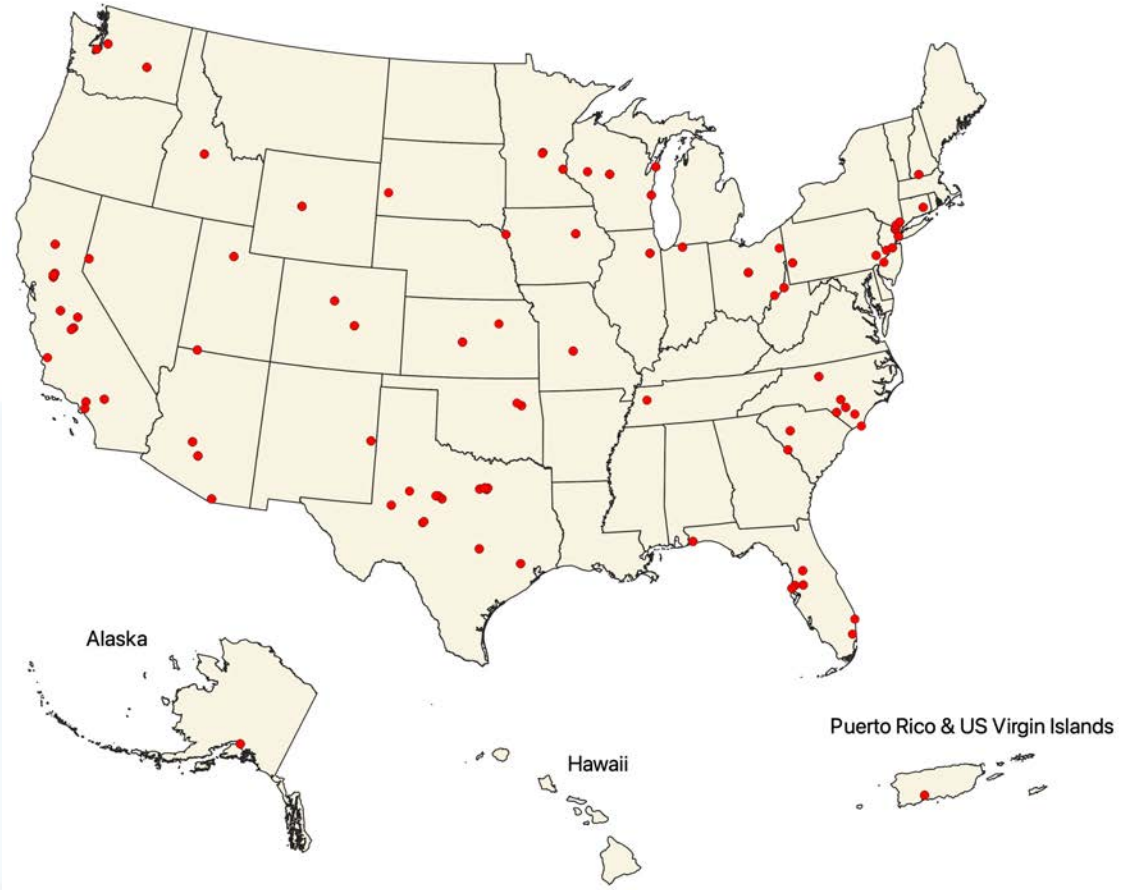
PWSs w/ Reg Exceedance (10 ppt MCL)

- **Third data release** (2/1/2024)
- 228 PWSs w/ exceedances of EPA's Draft PFAS Reg
  - PFOA or PFOS > MCL of **10 ppt**, or
  - HI index > 1
- 34 of these PWSs in CA/NV



PWSs w/ Reg Exceedance (70 ppt MCL)

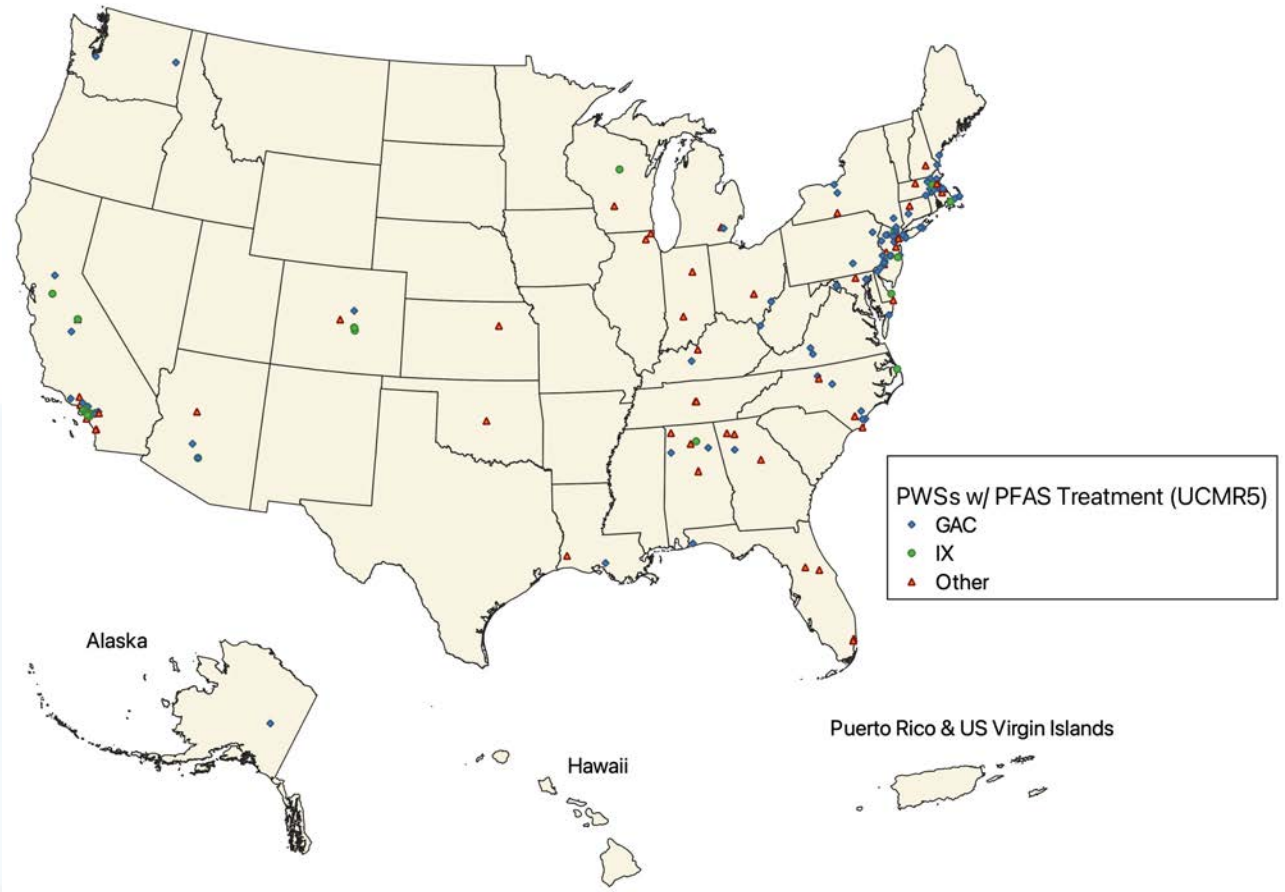
- **Third data release** (2/1/2024)
- 97 PWSs w/ exceedances of EPA's Draft PFAS Reg
  - PFOA or PFOS > MCL of **70 ppt**, or
  - HI index > 1
- 14 of these PWSs in CA/NV



What do we know about treatment?

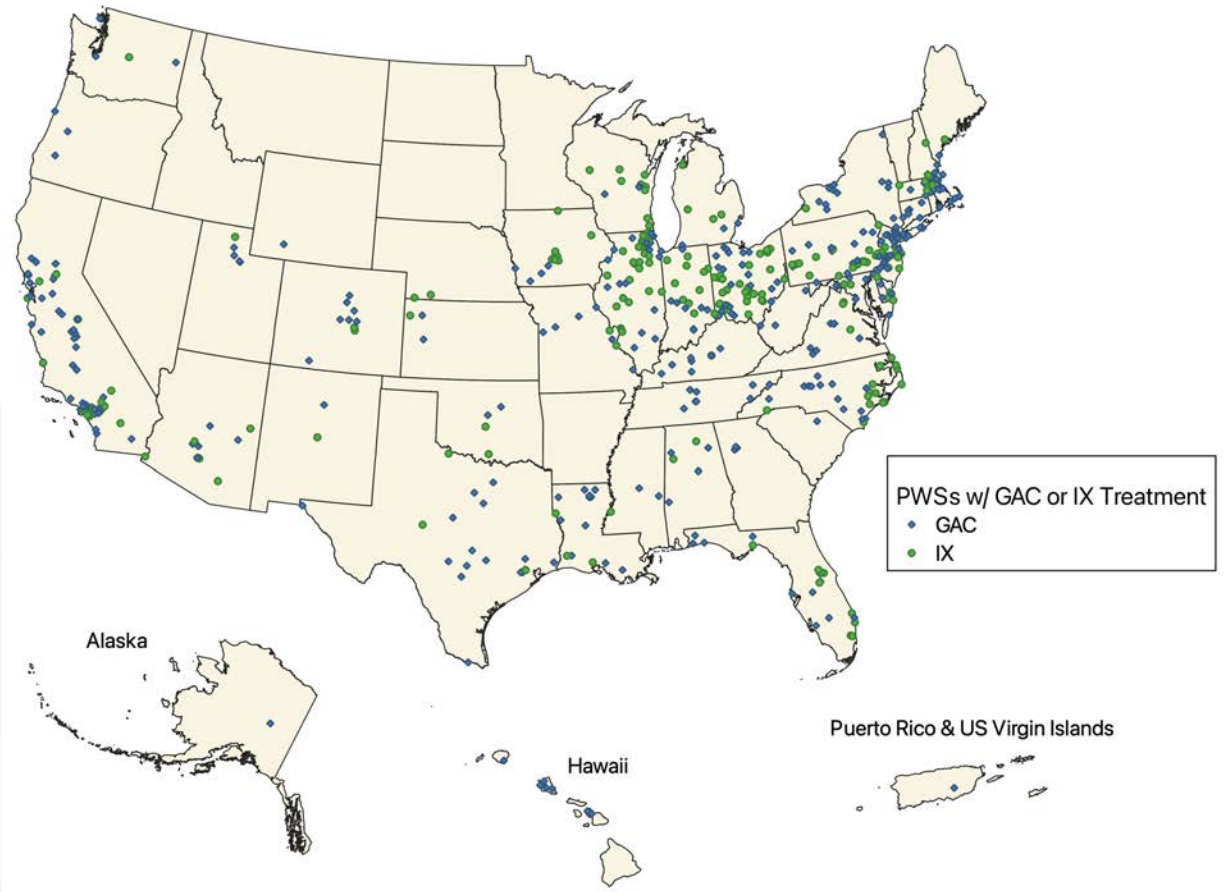
PWSs w/ PFAS-Specific Treatment

- Third data release (2/1/2024)
- 179 PWS reported implementing treatment for PFAS
  - 92 (3.5%) PWSs w/ GAC
  - 45 (1.7%) PWSs w/ IX
  - Some PWSs reported more than one treatment type
- 39 of these PWSs in CA, 0 in NV



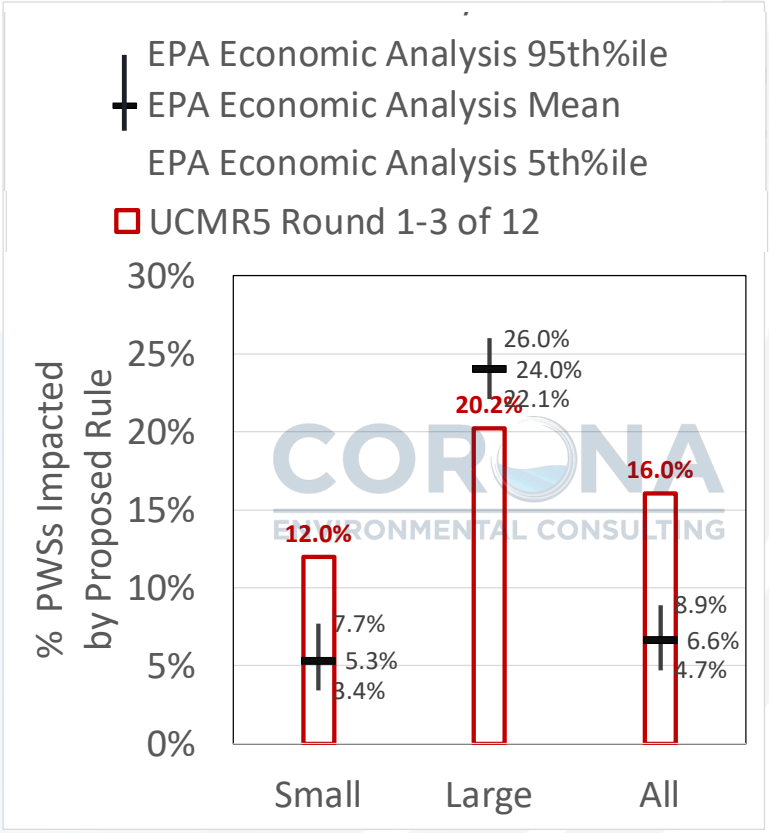
PWSs w/ GAC or IX Treatment

- Third data release (2/1/2024)
- 617 PWS reported GAC or IX treatment at 1 or more facilities
  - 386 (14/6%) w/ GAC
  - 231 (8.7%) w/ IX
- 84 of these PWSs in CA, 0 in NV
- Includes treatment for PFAS and/or any other purpose



Comparing EPA Estimate with UCMR5 Data

- EPA **overestimated** large water systems, and **underestimated** small water systems impacts
- **What does this mean?** Likely increases realized costs and decreases realized benefits
- **So what?** More to be learned from continued monitoring; real data should be used in regulation



UCMR5 Round 1-3 Data

Conclusions

- Bias in historical data sets to date
- UCMR5 will be most representative
- However, by design, smaller systems (& GW systems) will always be less represented in UCMR
- As a result, far more uncertainty in projecting smaller systems w/ potential MCL exceedance, impacting cost & benefit projections
- Regulation should be informed by UCMR5 results!

Questions?

Chad Seidel, Ph.D., P.E.
President
303.887.1853
cseidel@coronaenv.com
www.coronaenv.com
Twitter: @chadseidel