Joint Standing Committee on Agriculture, Conservation and Forestry

Updates on Maine's PFAS Soil and Water Investigation

February 1, 2023

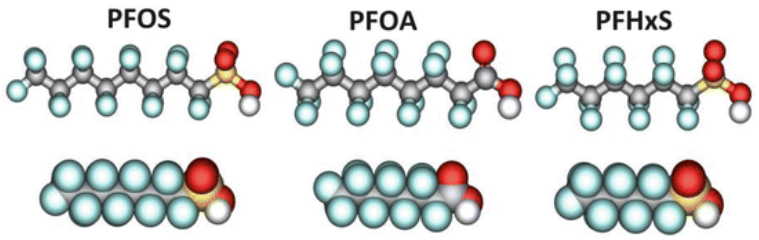
Susanne Miller, Director
Bureau of Remediation & Waste Management

What are PFAS?

PFAS = per- and poly fluoroalkyl substances

- 32 MRS §1732, 38 MRS §1612 → Any member of the class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom

- Used in consumer products – grease and water repellant, heat resistant due to a strong C-F bond = very difficult to break



Where are we Finding PFAS in Maine?

In ground and surface waters, soils, plants, and wildlife

Sources include:

- Biosolids land application sites
- Contaminated/remediation sites
- Federal facilities
- Active/closed landfills
- Active business operations
- Agricultural operations

Residuals in Maine

- The Maine Residuals Program includes land application of sludge *and* septage
- Administered through Residuals Management Unit, which falls under the Materials Management Division, Bureau of Remediation and Waste Management
- Lots of legislative activity in Maine
  - Interim Drinking Water Standard of 20 ppt for sum of 6 PFAS (PFOA, PFOS, PFNA, PFHxS, PFHpA, PFDA)
  - Soil and Groundwater Investigation
  - Ban of Land Application of Sludge
  - Products Reporting
  - And much more not part of this presentation!

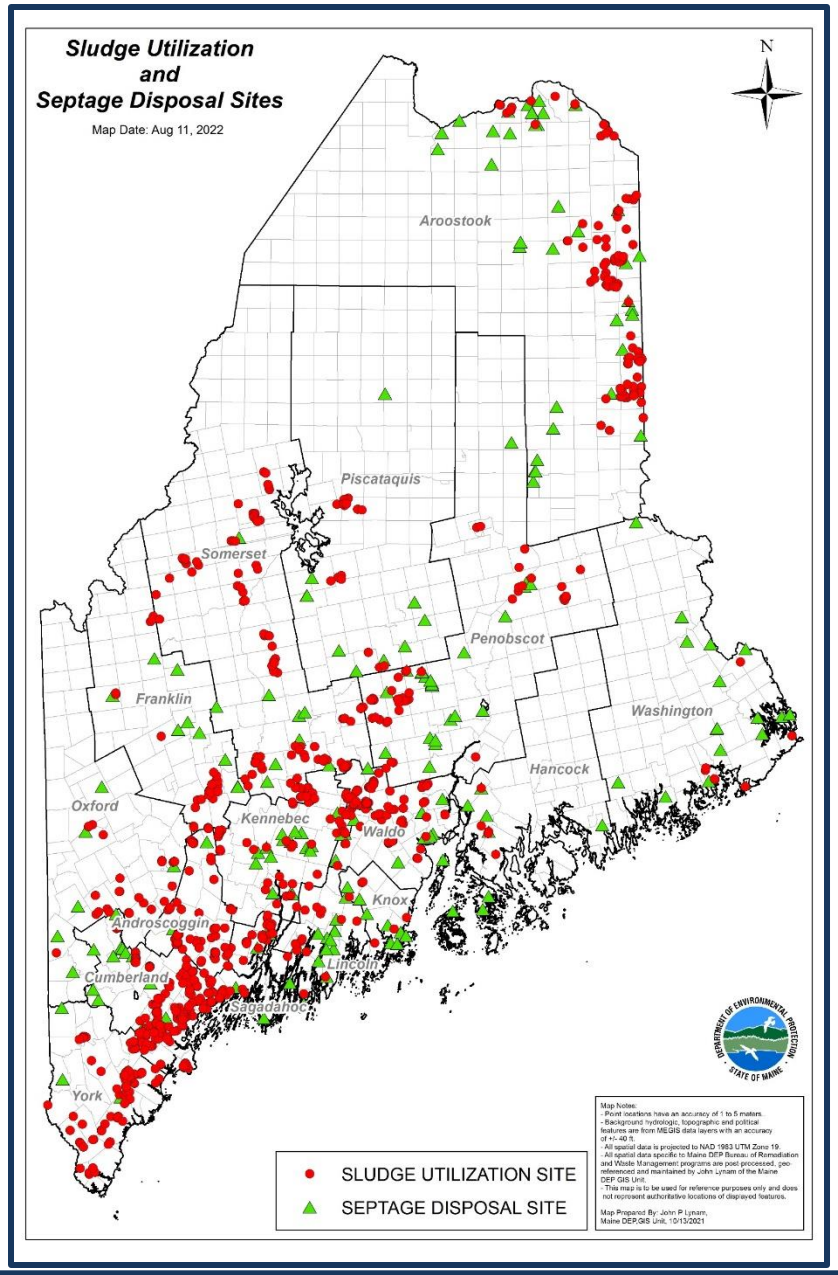
Soil and Groundwater Evaluation

Public Law 2021, Chapter 478: *An Act To Investigate PFAS Substance Contamination of Land and Groundwater*

- Effective October 18, 2021
- Requires DEP to establish and implement a soil and groundwater evaluation to identify contamination derived from licensed land applications of **sludge and septage**
- Over 700 land application sites statewide
- Half of all sites must be completed by 2024; all by 2025

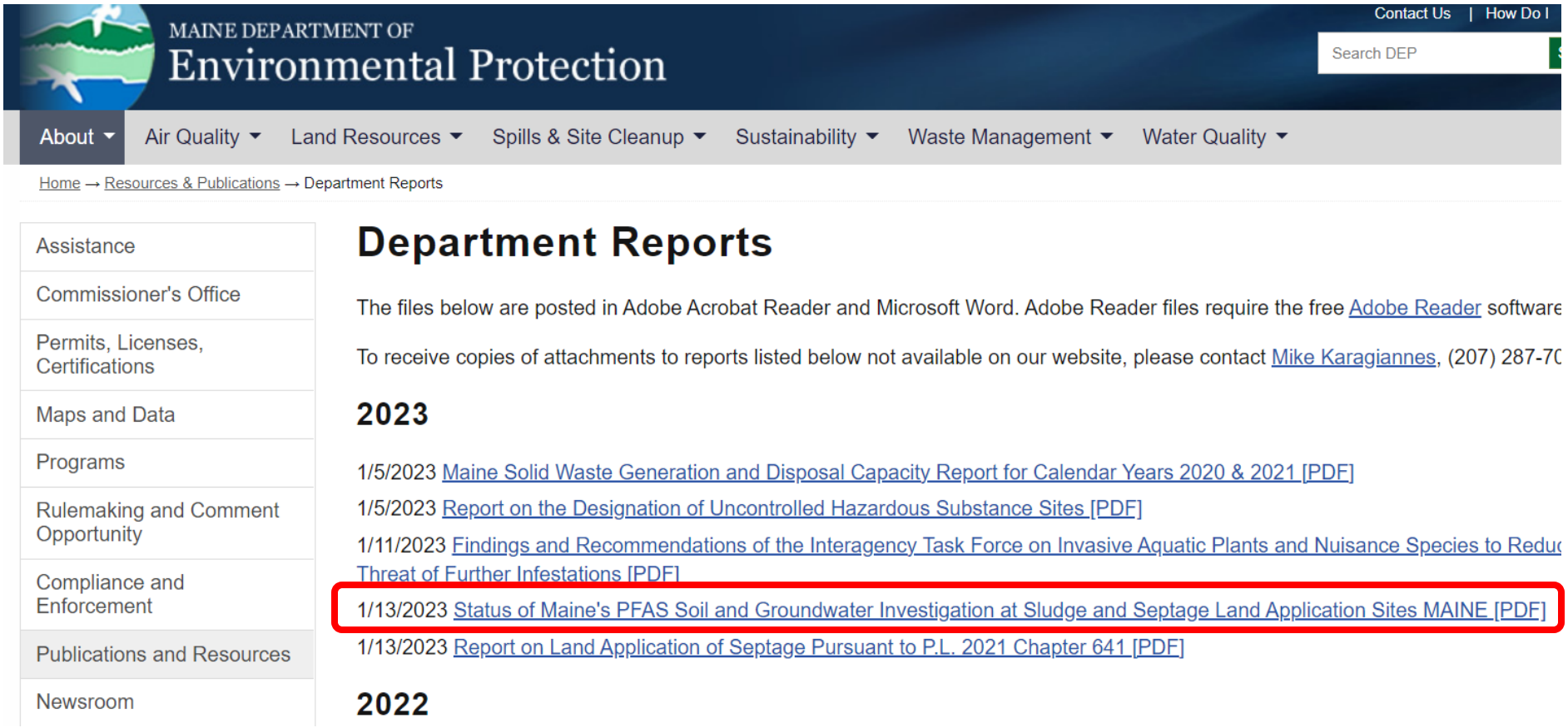
PFAS
Soil and Groundwater Investigation

- Sites often include multiple fields/locations crossing municipal boundaries, lots of acreage
- Some sites were used by multiple generators – and sludge from multiple sources may have been applied to one location
- Land ownership and lot size changes



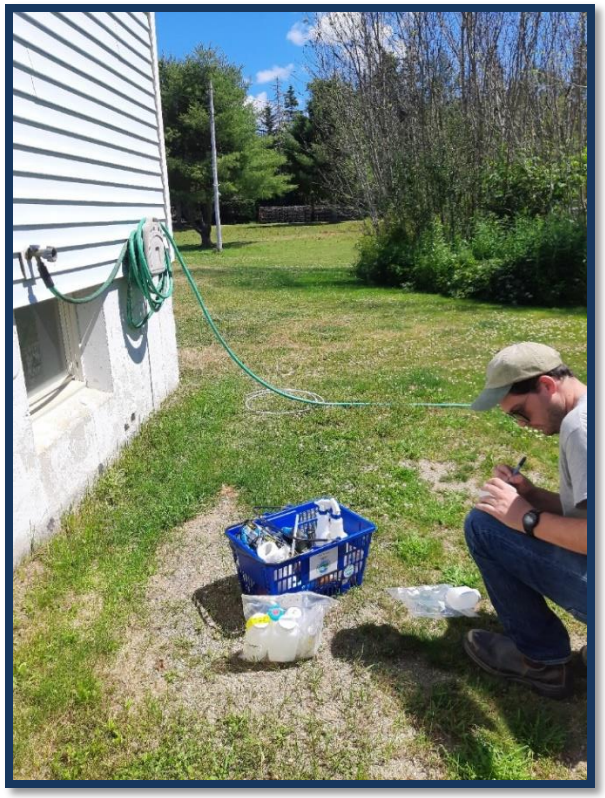
Residuals Investigation - Report

- Submitted to Legislature - January 15th



Prioritizing Sampling Locations

- Sludge sites grouped into four Tiers based upon:
  - Volume of sludge land applied
  - Anticipated presence of PFAS in sludge
  - Proximity of known receptors
- Tier I sites just about complete; currently working on Tier II
- Greatest number of sites likely in Tier III category
- Septage sites managed separately
  - Septage site investigations began summer 2022
  - Expect to be completed by 2024

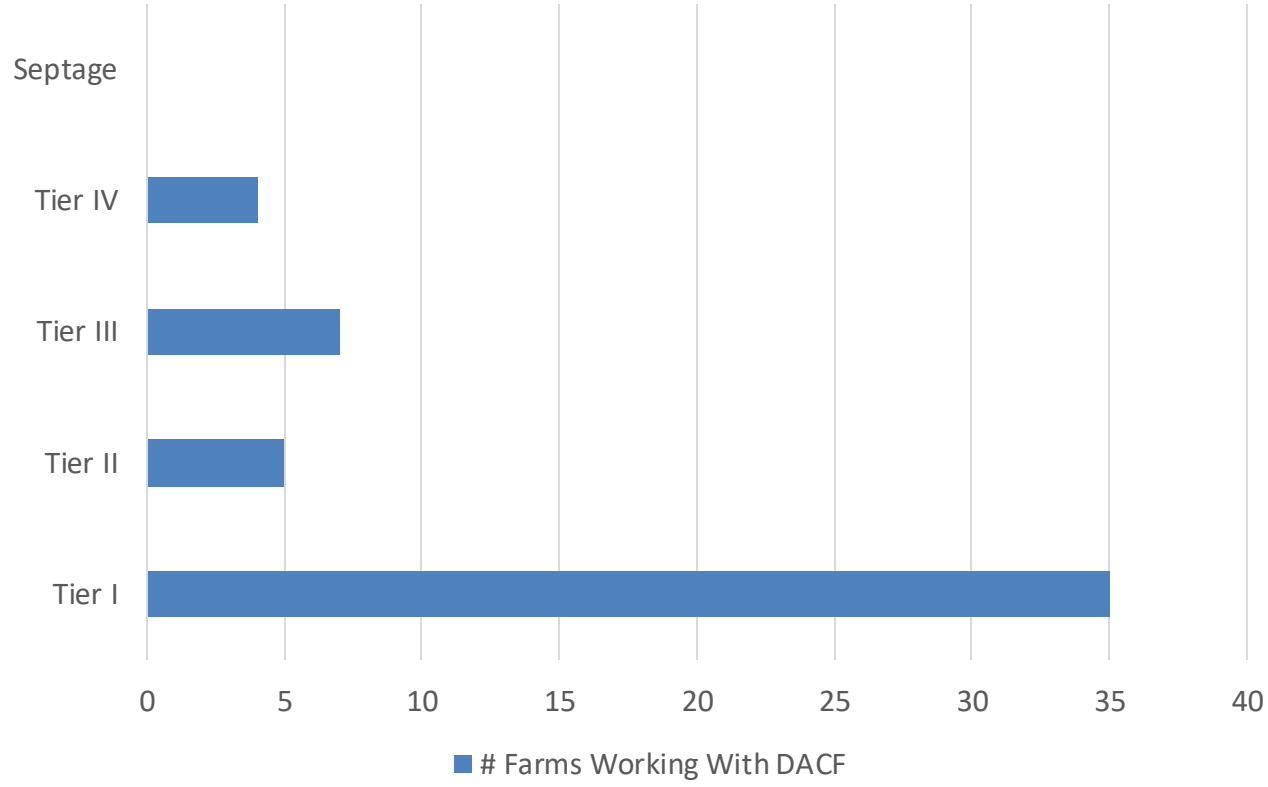


Residuals Investigation - Progress

- 1,037 licensed “sites” for investigation
  - Increase - 700 originally estimated
  - Includes sludge and septage
  - Changes to land ownership sites over years and decades
- 15% Groundwater sampling completed
- 14% Soil sampling completed
- ~ 308 residential water treatment systems installed

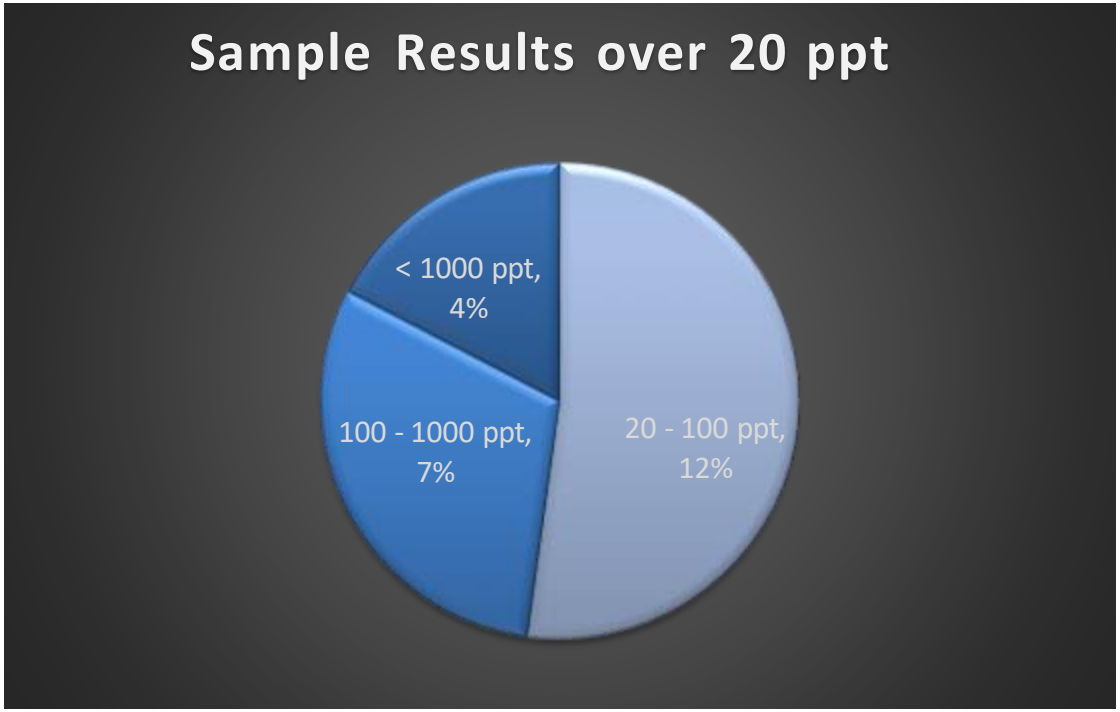
Residuals Investigation - Farms

- 56 Farms working with DACF
- 50 associated with Sludge/Septage Sites



Residuals Investigation – Groundwater

- 77% Groundwater wells sampled lower than Maine's interim standard
- Remaining 23% as follows:



Residuals Investigation - Soil

- ~ 400 **soil samples** collected so far
- No enforceable PFAS soil standard or one number to explain what PFAS in soil levels mean
- Screening levels typically based on use and function of soil
- DEP screening levels for residential use, recreational use, redevelopment
- DEP does not have screening levels for agricultural use

Residuals Investigation - Trends

- Soil concentrations at investigation sites generally higher than Maine's background levels
- PFOA and PFOS only 2 PFAS found in > 75% of soil samples collected
- PFAS contamination of water supplies generally observed in close proximity (w/in 1/10th of a mile) to licensed land application fields
- No obvious seasonal trends observed in water wells monitored > 1 year
- Much more to learn!

DEP Tools and Resources

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Environmental Protection

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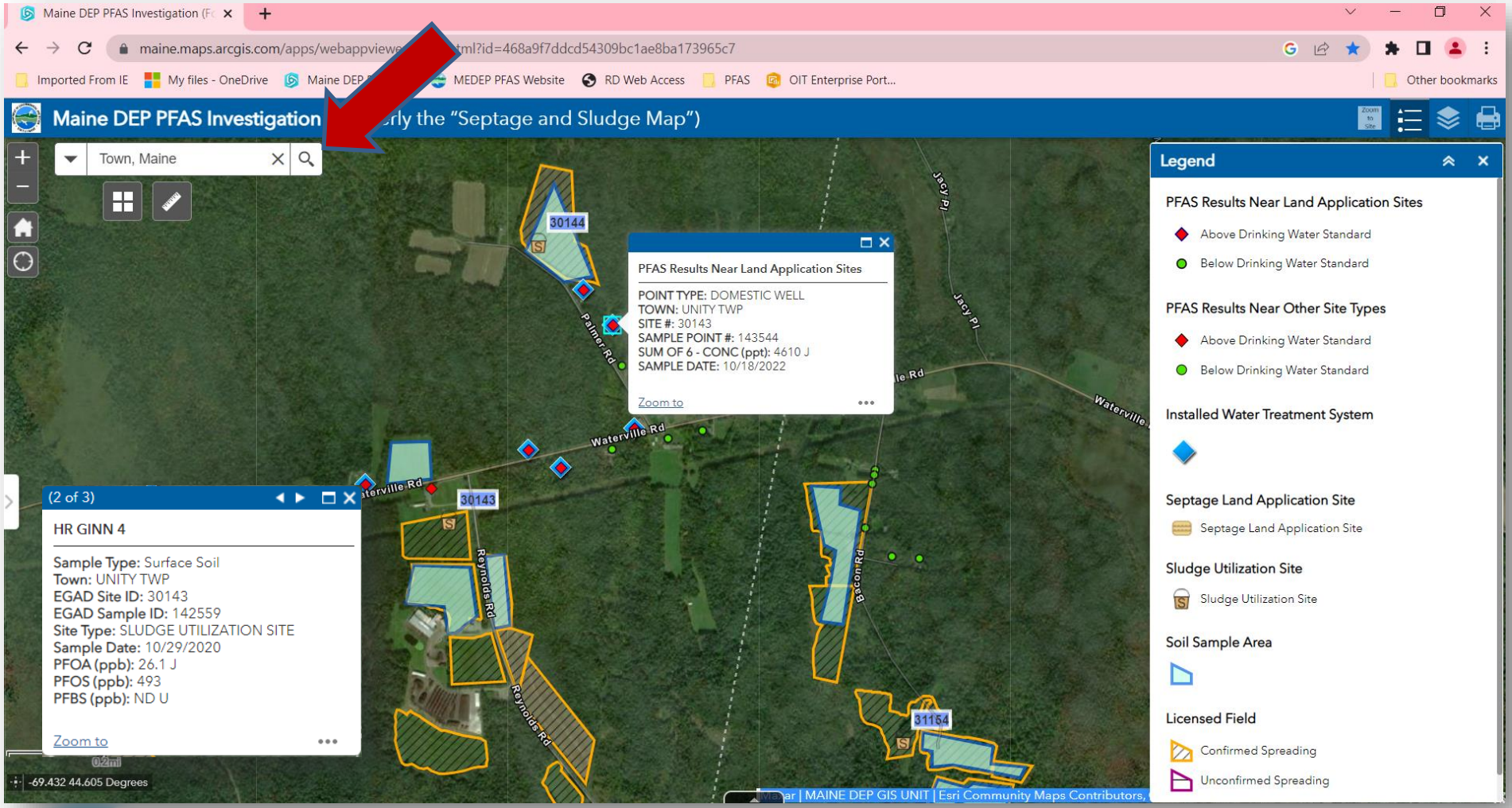
- Monitoring and Reporting
- Laws
- Rules

Per- and Polyfluoroalkyl Substances (PFAS)

Click on the topics below to expand each section.

- What is PFAS? +
- Where is PFAS in Maine? +
- What is Maine doing about PFAS? +
- PFAS in Products +
- What is EPA doing about PFAS? +
- How can PFAS be removed from the environment? +
- Data and Guidance +
- Updates and Timeline +
- More Information +

Maine DEP PFAS Investigation Map



Contact:

General information about PFAS: pfas.dep@maine.gov
PFAS in Products in Maine: PFASProducts@Maine.gov

www.maine.gov/dep

Maine Agricultural PFAS Overview

February 1, 2023

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Department of Agriculture, Conservation and Forestry

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Topics

- Timeline of PFAS Response
- Agencies' Roles and Coordination
- DACF Farm-Specific Response
- PFAS Investigation Principles
- Examples (Beef, Produce)
- Financial Assistance
- Where are We Now?
- Reasons for Hope/Challenges
- Pesticides

Timeline of PFAS Response

- 2016: Discovery of impacted dairy farm in Arundel
  - Creation of milk PFOS action level
- 2019: Governor Mills PFAS Task Force created
  - Recommendations regarding safe drinking water and food and identifying and investigating PFAS in the environment.
- 2020: Retail milk testing identifies Fairfield dairy farm with high PFOS. Third dairy discovered thereafter.
- 2021: Legislature approves budget for DACF and DEP response
- 2022: DACF hires six FTE's; seventh slated for 2023.
- 7,600 farms in Maine. Vast majority likely not impacted.
- **Not a "Maine issue."**

Agency Roles & Coordination

Maine DACF –

- Working directly with commercial farms regarding PFAS impacts pertaining to commercial agriculture
- Conducting sampling of farm products (meat, milk, vegetables, etc.), soils, and irrigation water
- Regulating acceptable concentrations of PFAS in farm products

Maine DEP –

- Testing permitted sludge sites and drinking water sources

Maine CDC –

- Develops action levels and screening levels for farm commodities and agronomic pathways
- Consults with Maine DACF regarding site-specific farm scenarios

DACF's Farm-Specific Response

Support farms by identifying PFAS contamination, pursuing strategies to reduce or eliminate PFAS, and providing financial assistance to retain farm viability.

- Data is key. Comprehensive, ongoing sampling.
- **Every farm is different**.
- Progress in dropping PFOS levels in milk and beef cattle.
- Not all PFAS are the same.
  - PFOA doesn't readily accumulate in beef
  - Little uptake in asparagus, garlic, potatoes, grains, corn, etc.

PFAS Investigation Principles

- **Gather Information**
  - Inputs, products, operations, animal management, etc.
- **Sampling plan** created.
- **Time** Few labs, long wait times.
- **Result(s) interpretation** Results validated and assessed inter-agency.
- **Mitigation recommendations** presented with follow-up testing. CDC input.
- **Financial assistance** to farms.
- **Mental health** and other support resources exist via partner organizations.

https://www.maine.gov/dacf/ag/pfas/index.shtml

Beef Producer Example

- Beef above Action Level
- Tested soils (pasture & hay fields), water, grain, and frozen product
- Results: water contaminated, pastures low, hay fields higher
- DACF installed water filter, provided clean feed, recommended grazing/feeding strategies
- Live muscle biopsies. Serial blood samples. Slaughter sample. Result: animals below the Action Level and most ND

Vegetable Farm Example

- Irrigation water: ~9,000 ppt (Sum6)
- DACF collected farm info, sampled products, fields, and greenhouse soils
- Water primary source of exposure. Low level in soil but not of concern.
- DACF trucked water during 2022 season. Treatment system installed in August – ongoing monitoring.
- Funded infrastructure improvements (updated greenhouse) for year-round harvesting and to reduce water usage during field season.

DACF's Financial Assistance

Testing Reimbursement	Water Filtration	Infrastructure Investment	Income Replacement	Livestock Indemnification
Reimburse producers who self tested (didn't wait for DEP/DACF). Covers soil, farm water, and other media. Covers third party contractors who conducted sampling.	May reimburse farms that previously installed water filtration on their farm wells 20 ppt or higher. Pay for new systems for farms. Cover yearly maintenance, testing, and replacement parts.	Assist farms that need help shifting to new systems to maintain viability. Examples: clean feed; well-drilling; equipment to switch to new crop, fencing new fields for grazing.	Provide compensation to farm with PFAS contamination causing them to cease/slow production. Payment(s) for up to 1 year's gross income. Will assess ongoing sales, other PFAS assistance.	Provide compensation for value of animals contaminated by PFAS at levels where depuration is unlikely to be feasible due to timeframe, financial costs, and farm capacity. (USDA program also provides this assistance for dairy cows).

MOFGA/MFT Coordination

Where are we now?

- Working with 56 farms with varying degrees of contamination.
  - 46 indicate either water or soil contamination (or both).
    - Waiting on remaining results
  - All farms are different.
- Over $2.0 M spent July ‘21-January ’23
  - > $600,000 income replacement
  - >$275,000 farm viability support
  - $350,000 laboratory testing
  - Funds allotted for multi-agency database effort, etc.
- Advocating for robust, coordinated federal response
  - Governor, Congressional offices, DACF to federal agencies & USDA Sec. Vilsack
  - National organizations
- Sharing learnings with other states

Reason for Hope/Challenges

- Bipartisan legislative support gives agencies the resources to provide assistance.
  - *Laboratory delays slow the process and add tremendous stress*.
- Animals can depurate over time when exposure halted.
  - *Certain species (pigs) may have long half lives; time to depurate not always feasible*.
- Water filtration can reduce/remove PFAS chemicals
  - *Remediation for soils not yet known*.
- Research is active in Maine, nationally, and internationally.
  - *Needed specifically focused on practical applications for farmers and agriculture*.

PFAS and Pesticides

In 2022, the Maine Legislature passed LD 2019

- Bans pesticides contaminated with PFAS
- Bans pesticides with intentionally added PFAS in 2030
- Defines PFAS as one fully fluorinated carbon
- Defines adjuvants as pesticides
- Revisits rulemaking authority for pesticide containers
- Directs the Board of Pesticides Control (BPC) to establish PFAS rules

In response the BPC has:

-Outreach to adjuvant users/sellers.
-Ongoing assessment of which pesticides will be affected by the 2030 ban.

In 2021, the Maine Legislature passed LD 264

- Requires pesticide registration affidavits disclosing intentionally added PFAS & storage in fluorinated containers
- Requires disclosure of a complete listing of all the ingredients of pesticide products

In response the BPC has:

Implemented software changes for the affidavits and product ingredient data in time for the 2023 registration year.

Thank You!

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https://www.maine.gov/dacf/ag/pfas/index.shtml

DEPARTMENT OF Agriculture, Conservation & Forestry

Update on MECDC PFAS Work in Agricultural Settings

Andrew Smith, SM, ScD

State Toxicologist

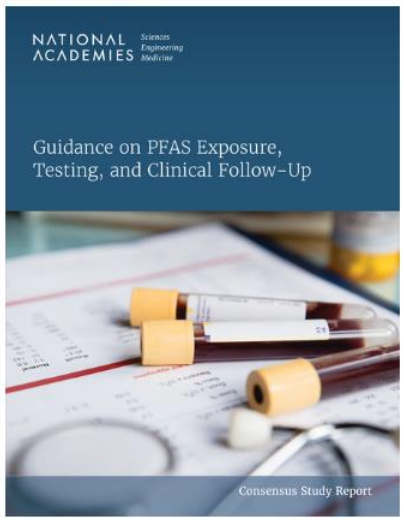
Maine Center for Disease Control and Prevention

Presented to the Joint Committee on Agriculture, Conservation and Forestry

February 1, 2022

Topics

- National Academies of Science, Engineering, and Medicine (NASEM) Report on Blood Testing and Health Monitoring

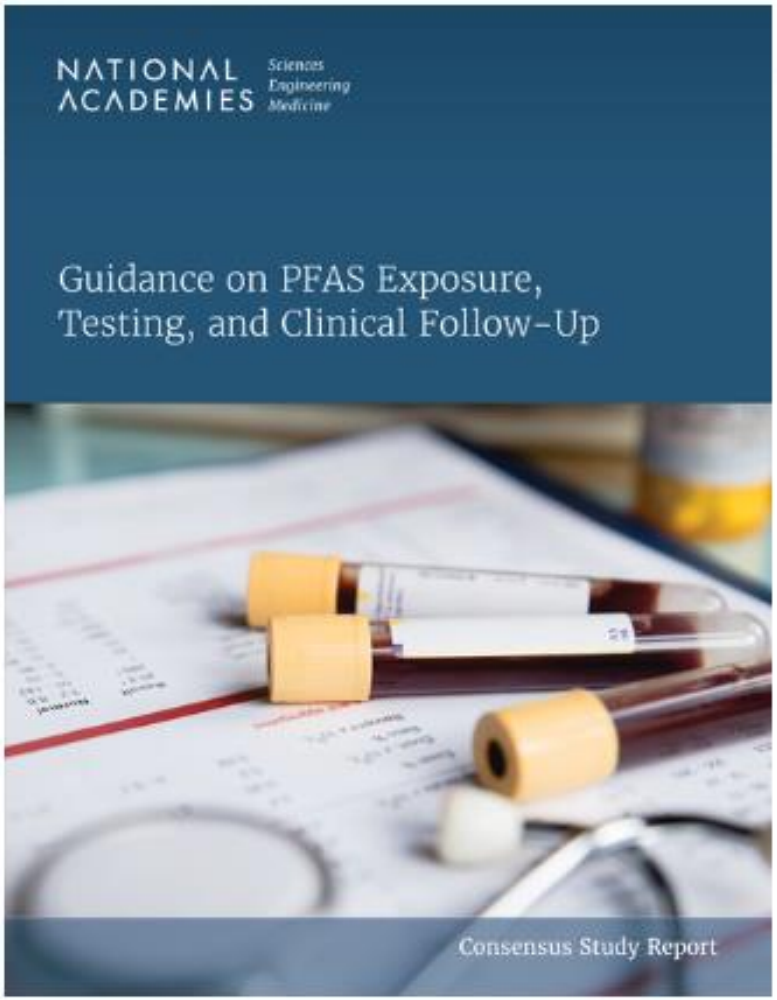


- Field Studies to generate actionable information for farmers

What NASEM has provided

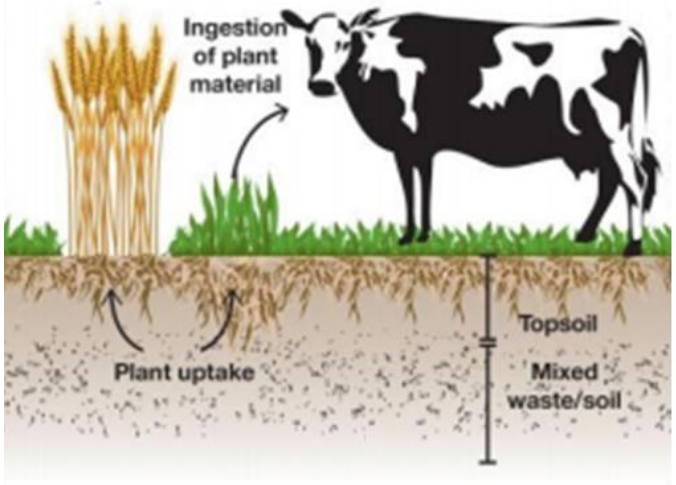
Recommendations for:

- Health effects of PFAS based on weight of evidence
- When clinicians should offer blood testing for PFAS
- Health monitoring based on PFAS blood levels
- Frequency of repeat testing for PFAS with a long half-life
- Improvements to the public health response to PFAS exposure



Source: https://www.nationalacademies.org/our-work/guidance-on-pfas-testing-and-health-outcomes

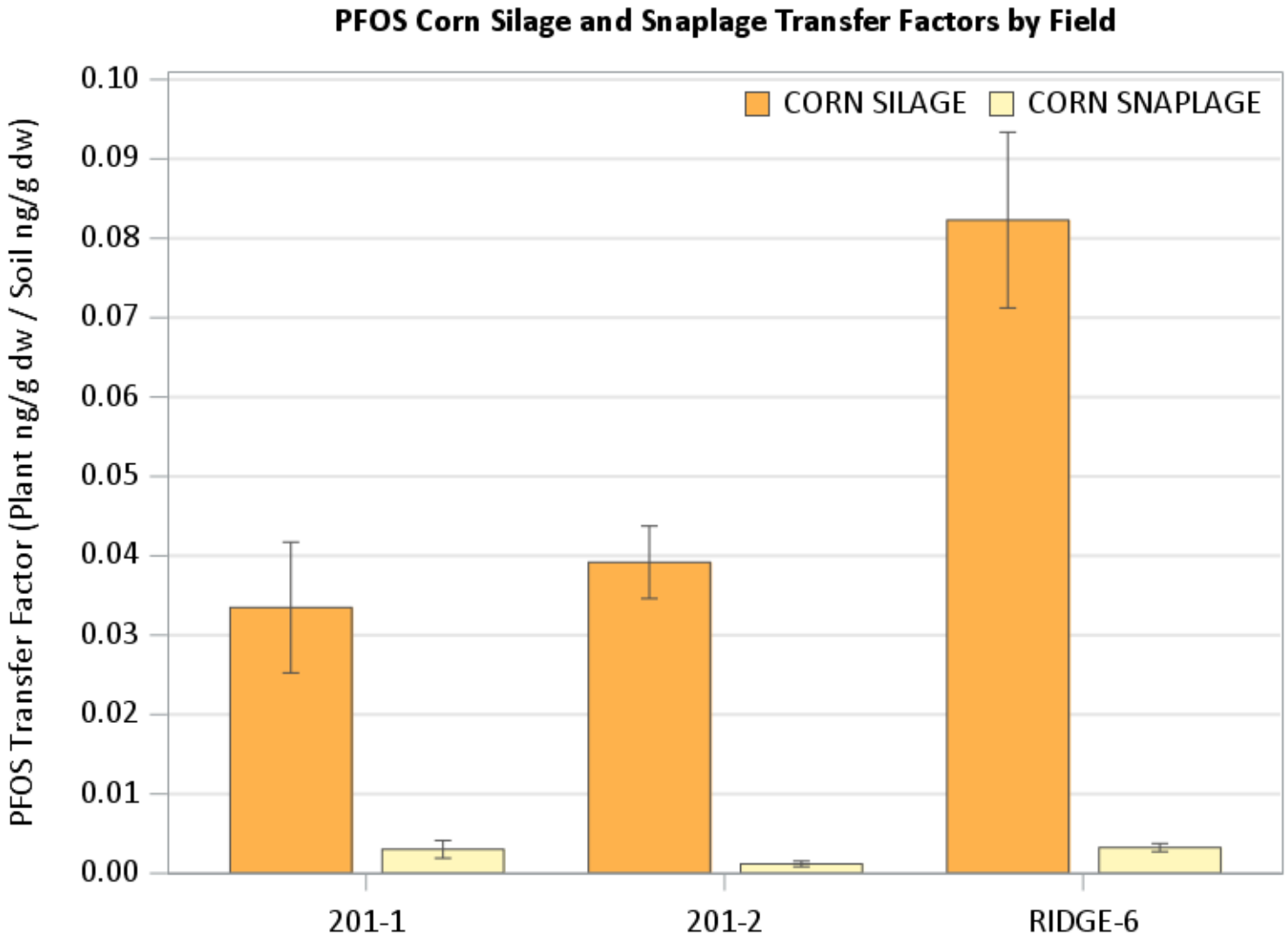
Building Models for the Agronomic Exposure Pathways



Soil → Hay/Corn → Cow → Milk → Child

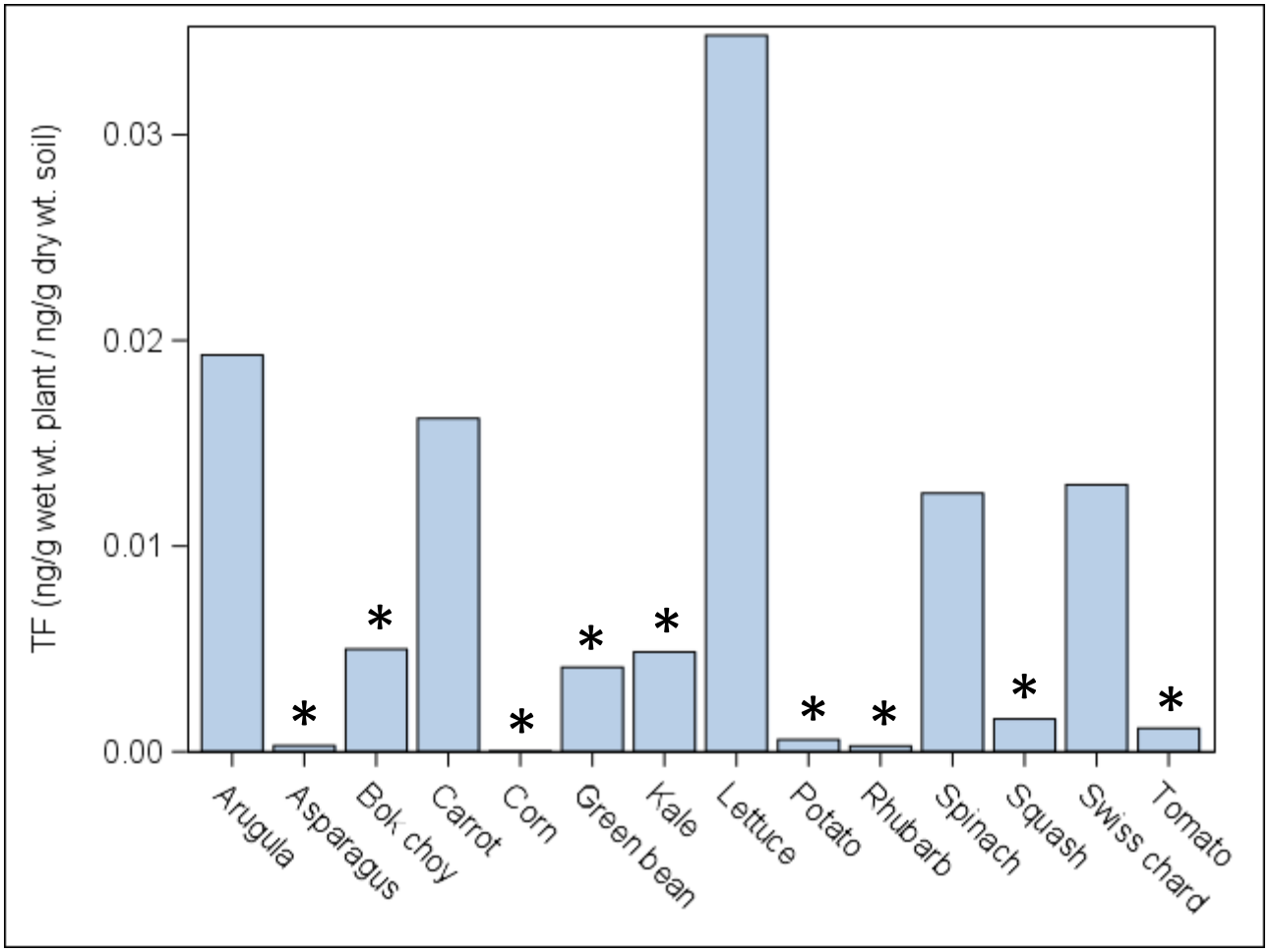
Corn Silage PFOS Uptake Study

Corn Silage vs Snaplage Transfer



Vegetable Uptake Field Studies

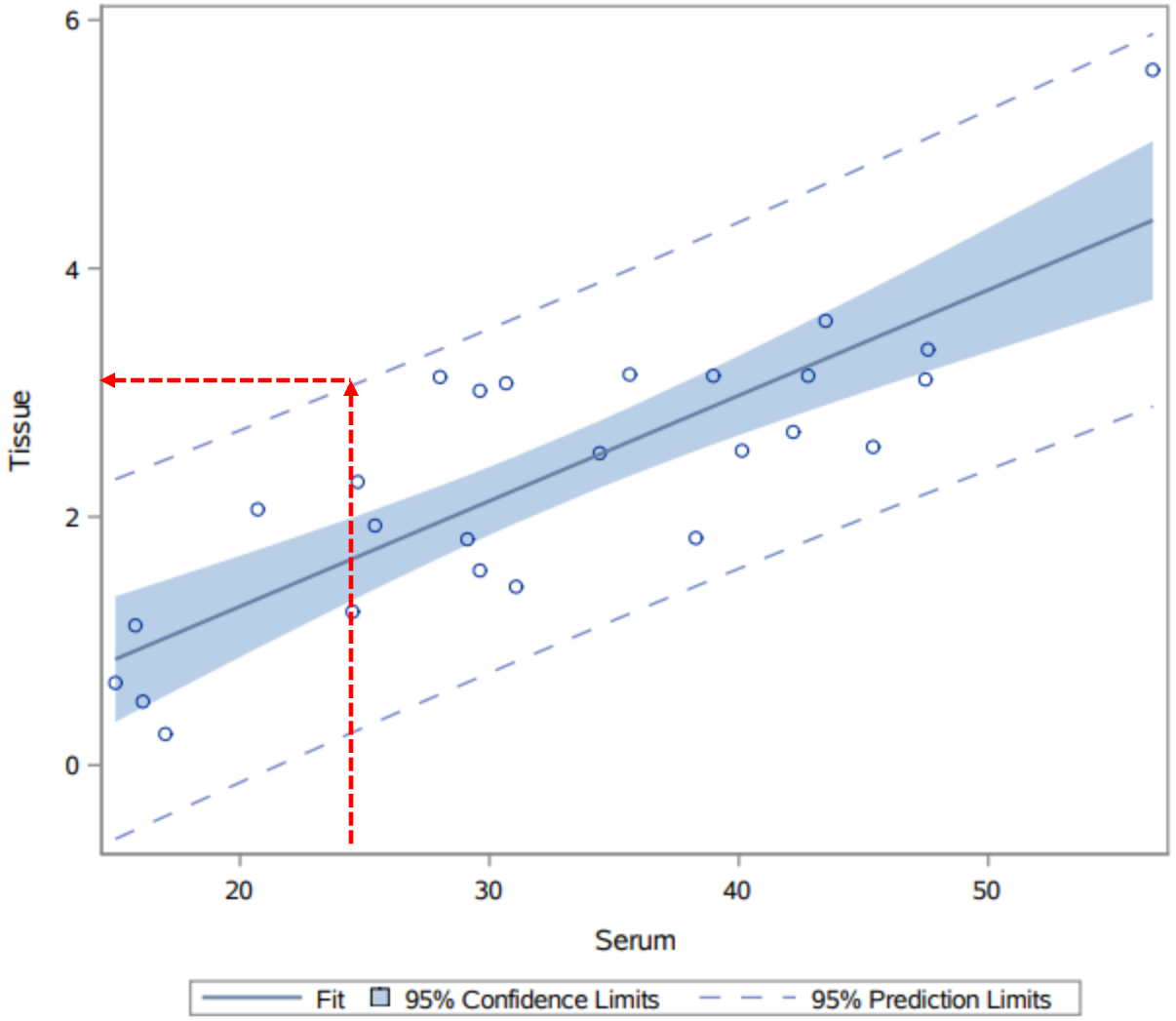
Vegetable Uptake Field Studies



* indicates upper bound TF estimate based on assignment of half the value of the LOD (approx. 0.02 ng/g for corn, 0.15 for other plants) to plant samples below LOD

Live Animal Test for PFOS

Predicting Muscle PFOS from Blood PFOS



Collaborators

Maine Department of Health and Human Services

Questions?

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Fund to Address PFAS Contamination

Joint Standing Committee on Agriculture, Conservation and Forestry

February 1, 2023

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Commissioner

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Fund to Address PFAS Contamination

$60 million fund to support producers impacted by PFAS contamination of agricultural land and water.

- **Short-term** (within 24 months of discovering PFAS): Support impacted farmers while they investigate and consider options.
- **Long-term**: Enable impacted farmers and farms to thrive in their new circumstances.

Phases of Development

Financial and Business Support Subcommittee

Short- and long-term financial and planning assistance for farmers impacted by PFAS contamination:

- Direct financial assistance
- Infrastructure investments
- Technical assistance
- Loan guarantees
- Public relations/marketing

Land Subcommittee

Recommend strategies to:

- Purchase and sell agricultural land with known PFAS contamination
- Provide information and guidance on buying or selling agricultural lands that have had sludge or septage applied

Research Subcommittee

Refine research topics

Identify categories of support, e.g., short-term applied research

Recommend strategies to fund research that informs farm management decisions

Health Subcommittee

Recommend strategies to:

- Make PFAS blood testing accessible and affordable
- Provide for medical monitoring
- Provide access to mental health care, as well as a system of peer support

Also, consider whether:

- Blood test results should be reportable to the State
- To conduct a public health study, *e.g.*, to determine how farmers are exposed/impacted differently from the general public

Follow our progress

Thank you

Beth Valentine
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