

Elucidating the role of PFAS chain length and functional group on the extent of groundwater contamination: a toolkit for local and tribal health departments

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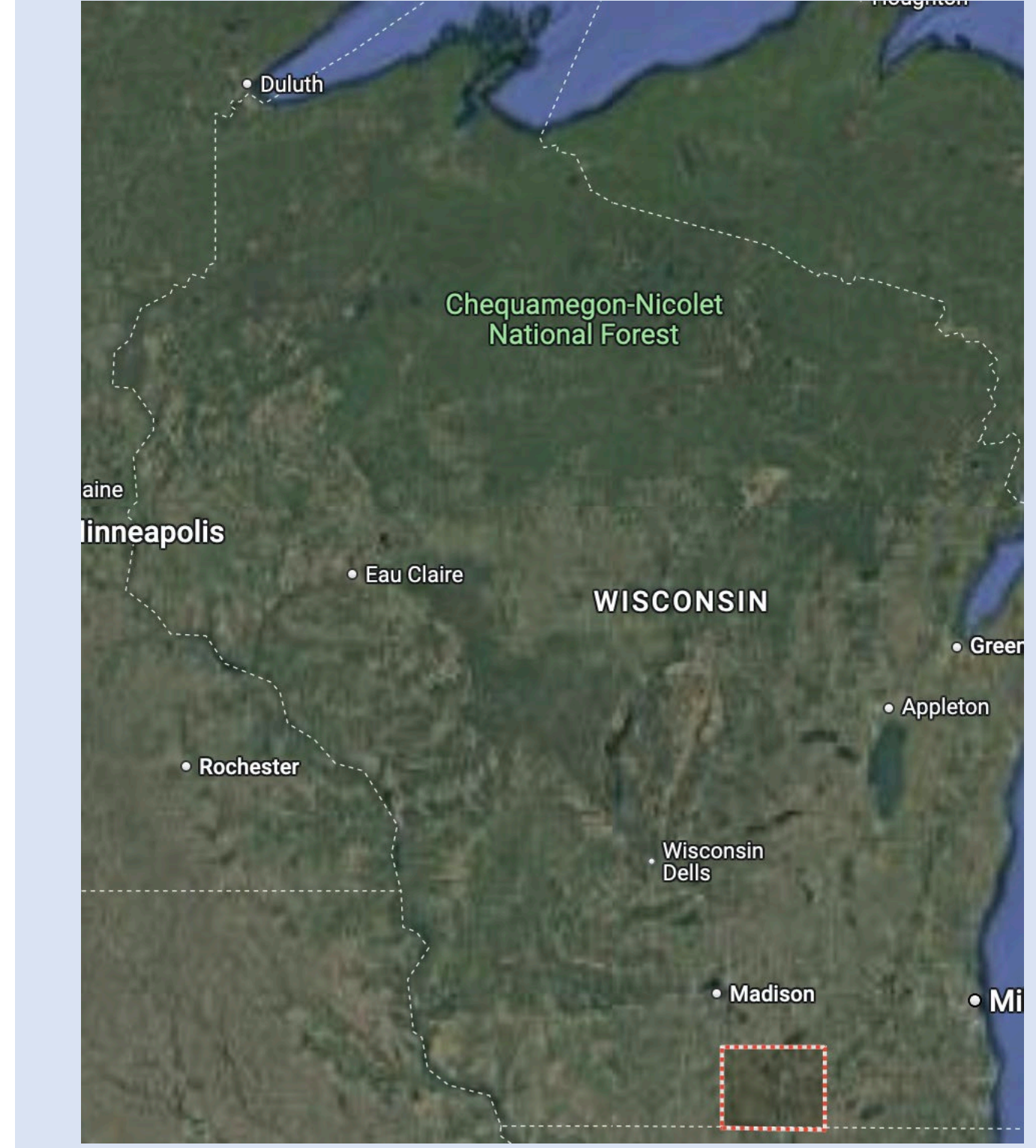
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Background

Winter 2024

Summer 2025

Per and poly-fluoroalkyl substances (PFAS) are a group of synthetic organic chemicals widely used in industry, manufacturing, and fire-suppressant foam at airports.



Inquires for sampling were sent out via mail, town hall meeting, and door to door knocking.

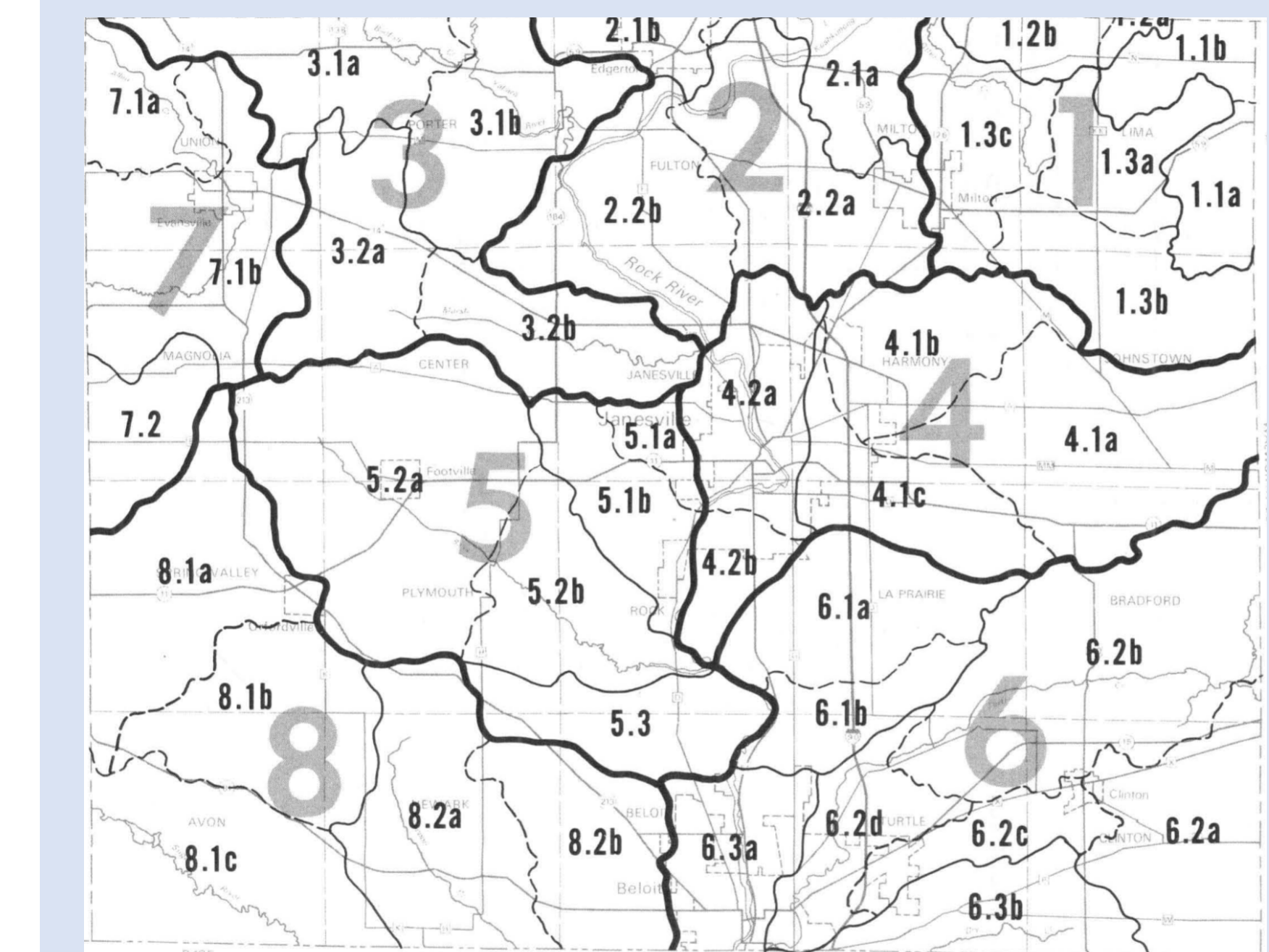
Private wells sampled in Rock County.

Samples were taken within 0.25, 0.5, 1, 2, 5 miles from private well with PFAS detection.

Private well results were communicated to well owners with local health department, state health department guidance.



40 private wells from each county will be tested for PFAS levels following a systematic approach surrounding a high detection of PFAS.



Utilize hydrology to predict PFAS contamination.

Increase cholesterol

Reduce antibody response

Decrease fertility in women

PFAS are known as “forever chemicals” that persist in the environment.

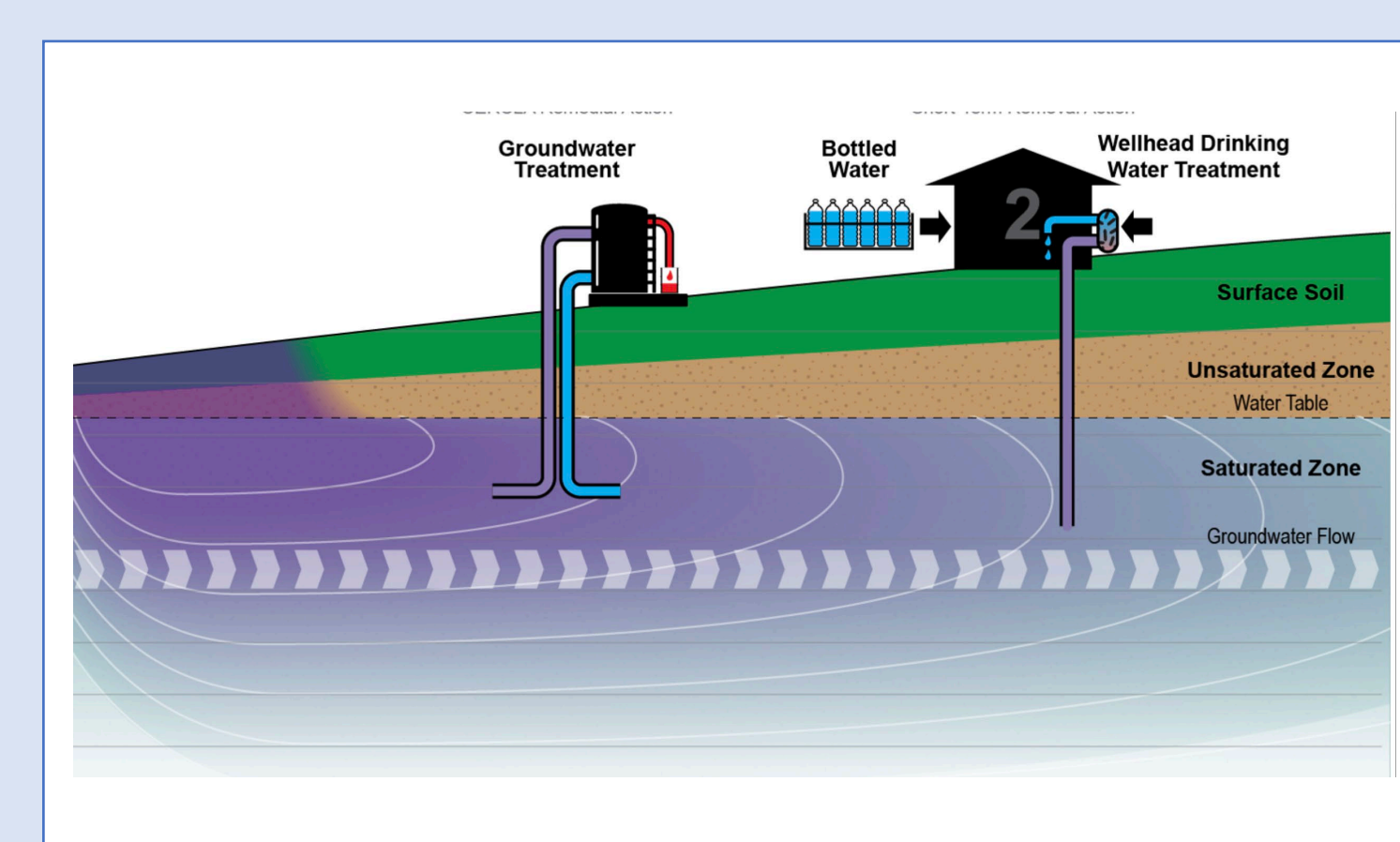
Exposure to PFAS in drinking water can present a human health risk.

It is important to understand how PFAS move throughout our groundwater to enhance our risk assessment for PFAS exposure throughout private drinking water sources.

| Compound | Final MCLG | Final MCL (enforceable levels) ¹ |
|---|--------------|---|
| PFOA | Zero | 4.0 parts per trillion (ppt) (also expressed as ng/L) |
| PFOS | Zero | 4.0 ppt |
| PFHxS | 10 ppt | 10 ppt |
| PFNA | 10 ppt | 10 ppt |
| HFPO-DA (commonly known as GenX Chemicals) | 10 ppt | 10 ppt |
| Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS | 1 (unitless) | 1 (unitless) |
| | Hazard Index | Hazard Index |

Multiple private wells recorded levels of PFAS above current federal MCL levels and recommended groundwater health standards.

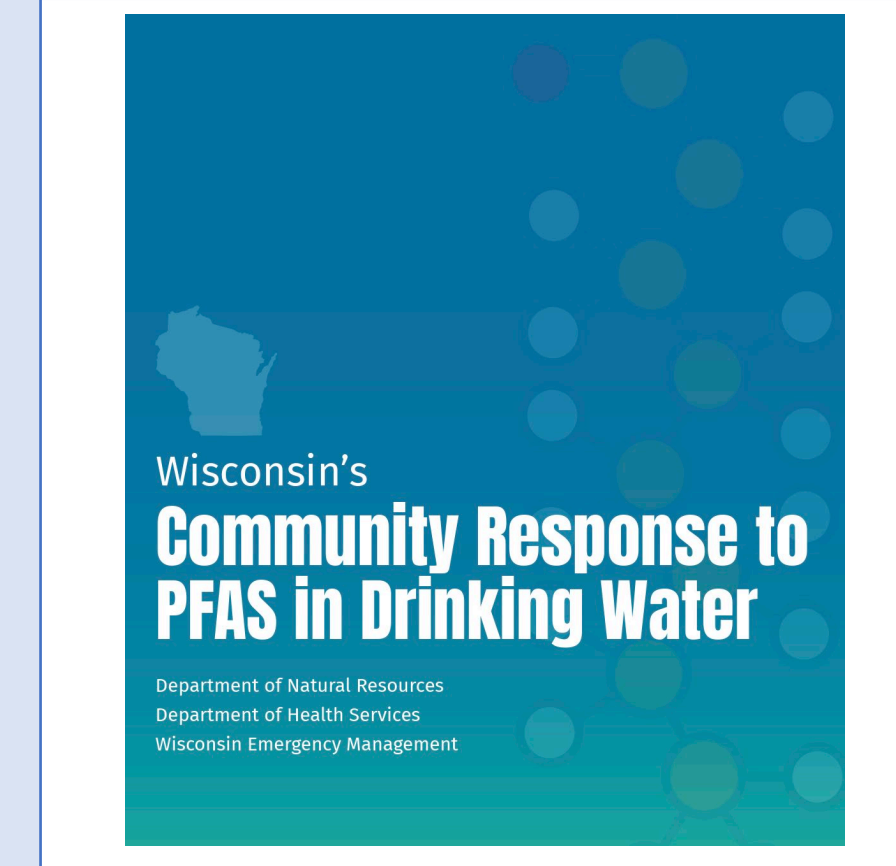
Research Objectives



How do PFAS move in groundwater?

Systematically conduct additional PFAS testing in private wells.

Determine PFAS functional groups and chain length correlate to contamination throughout groundwater.

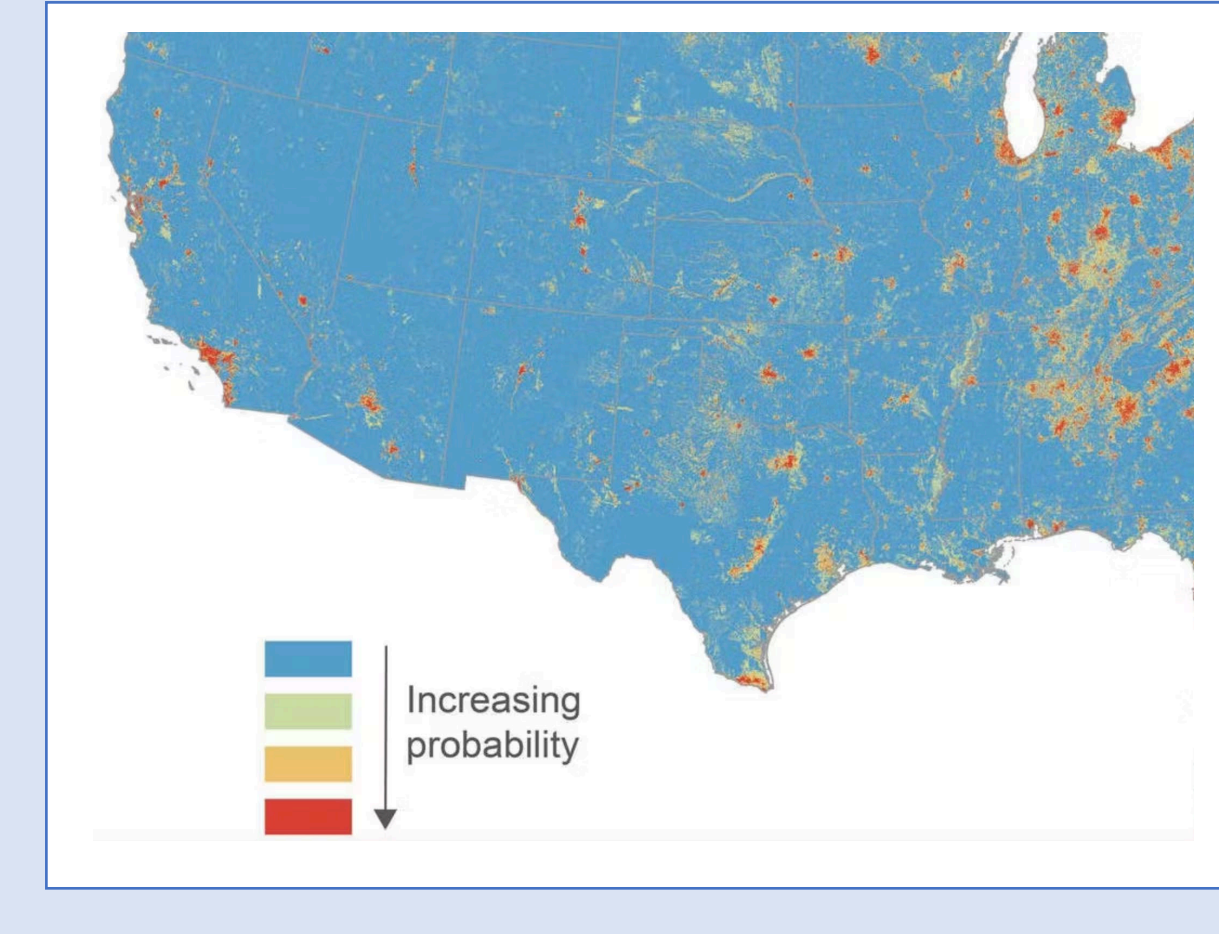


How do local health departments and private well owners prepare for PFAS contamination?

Work with local health departments to develop a toolkit for potential contaminated wells in the future.

Work with private well owners to develop a toolkit PFAS contaminated wells.

PFAS Communication



Can we predict PFAS contamination in groundwater?

Develop a PFAS risk map for private wells in Rock County based on the identified sources and hydrogeological data.

Create a toolkit for local health departments for how to react to a new PFAS detection in drinking water.

Create a toolkit for homeowner for PFAS contamination in drinking water source.

Acknowledgements

We sincerely thank the private well owners who provided access to their properties to sample and analysis well water. Without the help of private well owners, this work would not be possible. Thank you to the Wisconsin state lab of hygiene for conducting our water samples. Thank you to Wisconsin department of natural resources for funding this research. Thank you to the local health departments and department of health services for working directly with us on PFAS communication and sample collection.

