National Institute of Environmental Health Sciences
Your Environment. Your Health.

Welcome! SRP Risk e-Learning webinar series: Tools for PFAS Characterization

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National Institutes of Health (NIH)

Bethesda, MD

National Institute of Environmental Health Sciences (NIEHS) Superfund Research Program (SRP)

Research Triangle Park, NC

www.niehs.nih.gov/srp

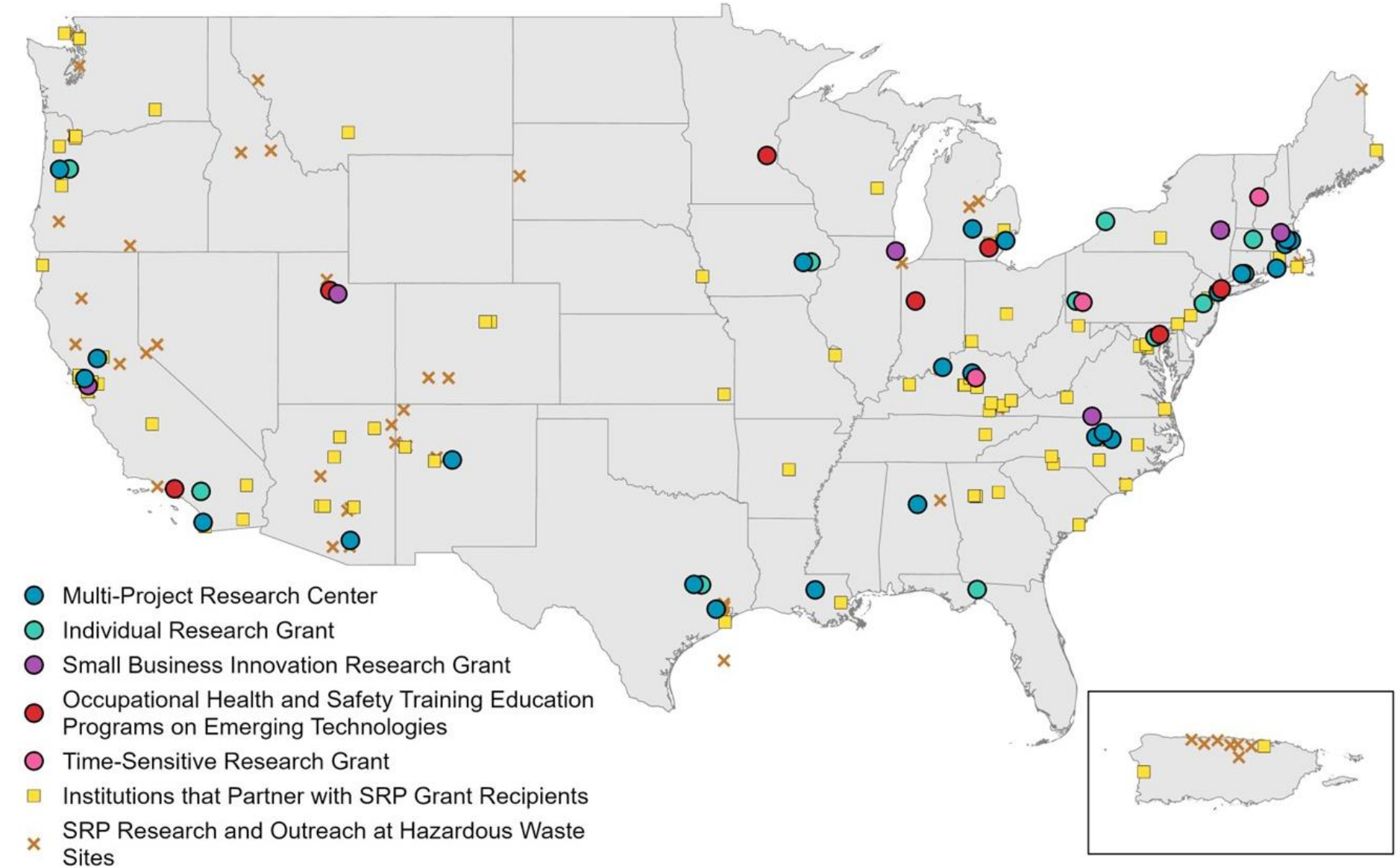
NIEHS Superfund Research Program Overview Video

SRP Mandates Drive the SRP Program

Integrating health and environmental/engineering sciences with emphasis in research translation, community engagement, data science, and training.

Health Effects	• Advanced techniques to detect, assess, and evaluate the human health effects of hazardous substances
Assessing Risk	• Methods to assess the risks posed by hazardous substances on human health
Detection	• Methods and technologies to detect hazardous substances in the environment
Remediation	• Basic biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances

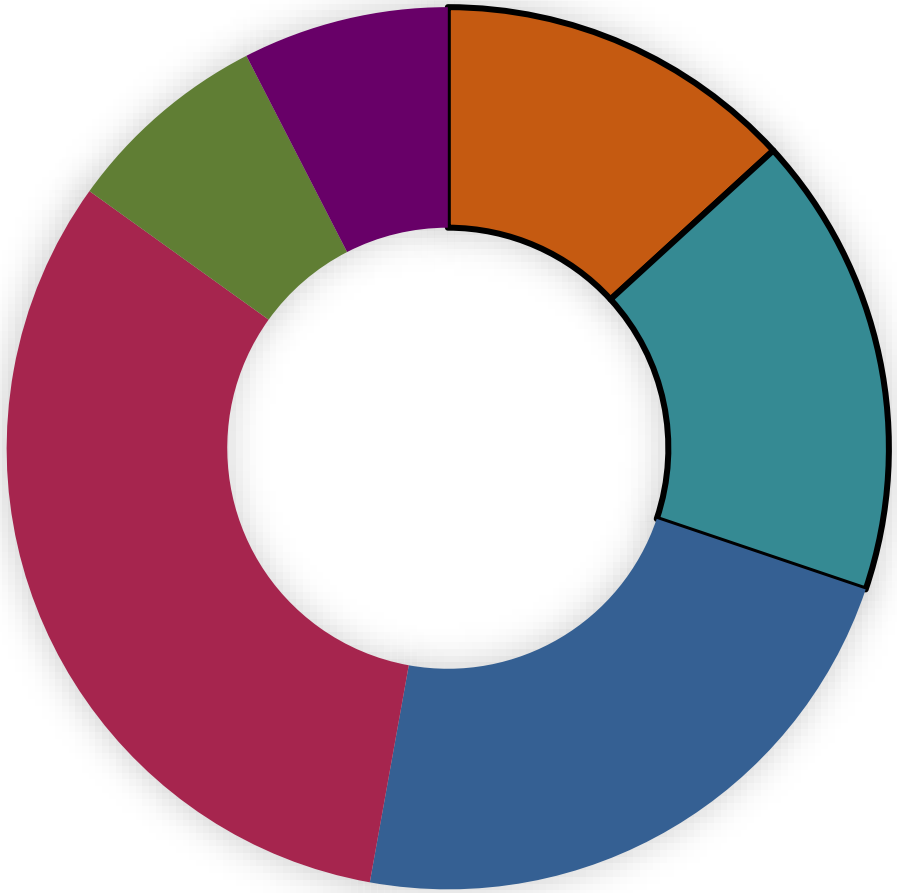
Where We Work



To learn more, see the Where We Work and SRP Funding Opportunities webpages.

SRP Per- and Polyfluoroalkyl Substances Research

Topic distribution of 46 PFAS-related projects in SRP's grant recipient portfolio.



- Modeling
- Detection
- Biomedical
- Remediation
- Community Engagement
- Research Translation

Risk e-Learning: Tools for PFAS Site Characterization

**project can fall in more than one category*

Image source: NIST.gov

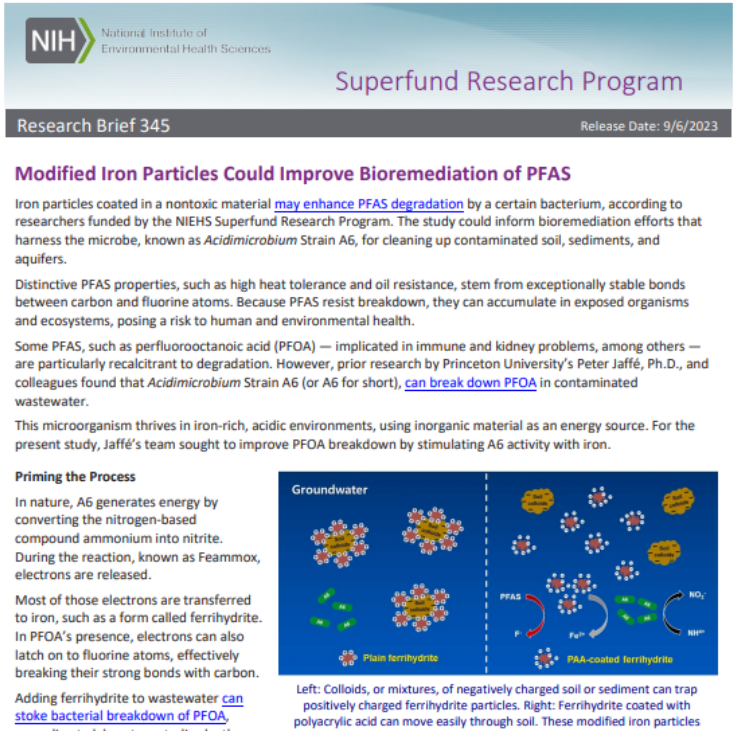
This map shows the locations of current and past SRP-funded projects related to PFAS.

For more information about PFAS, what they are, how people are exposed to them, and NIEHS-funded research, see this page.

Other NIEHS/SRP PFAS Resources

- **Research Briefs** (monthly science feature article/podcast)
  - Modified Iron Particles Could Improve Bioremediation of PFAS
  - Fighting Fluorine with Fluorine: New Materials Remove PFAS from Groundwater
  - Emerging PFAS Can Cause Changes in Gene Expression and Lipid Accumulation in Human Liver Cells
  - New Model Estimates PFAS Exposures From Contaminated Drinking Water
- **Other PFAS Features:**
  - News story: GenX Exposure Study reports results back to the community
  - News story: Plant-based material can remediate PFAS, new research suggests
  - Science Digest: Tackling PFAS from Many Angles
  - Public Health Impact Story: SRP Researchers Inform Health-Related Decision Making on PFAS
  - SRP Progress in Research webinar series: Session I – Per- and Polyfluoroalkyl Substances

To receive Research Briefs and News Features, please contact srpinfo@nih.gov


NIH National Institute of Environmental Health Sciences
Superfund Research Program
Research Brief 345 Release Date: 9/6/2023

Modified Iron Particles Could Improve Bioremediation of PFAS

Iron particles coated in a nontoxic material may enhance PFAS degradation by a certain bacterium, according to researchers funded by the NIEHS Superfund Research Program. The study could inform bioremediation efforts that harness the microbe, known as *Acidimicrobium* Strain A6, for cleaning up contaminated soil, sediments, and aquifers.

Distinctive PFAS properties, such as high heat tolerance and oil resistance, stem from exceptionally stable bonds between carbon and fluorine atoms. Because PFAS resist breakdown, they can accumulate in exposed organisms and ecosystems, posing a risk to human and environmental health.

Some PFAS, such as perfluorooctanoic acid (PFOA) — implicated in immune and kidney problems, among others — are particularly recalcitrant to degradation. However, prior research by Princeton University's Peter Jaffé, Ph.D., and colleagues found that *Acidimicrobium* Strain A6 (or A6 for short), can break down PFOA in contaminated wastewater.

This microorganism thrives in iron-rich, acidic environments, using inorganic material as an energy source. For the present study, Jaffé's team sought to improve PFOA breakdown by stimulating A6 activity with iron.

Priming the Process

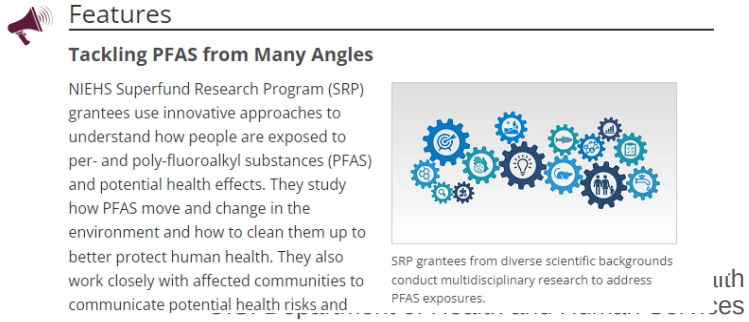
In nature, A6 generates energy by converting the nitrogen-based compound ammonium into nitrite. During the reaction, known as Feammox, electrons are released.

Most of those electrons are transferred to iron, such as a form called ferrihydrite. In PFOA's presence, electrons can also latch on to fluorine atoms, effectively breaking their strong bonds with carbon.

Adding ferrihydrite to wastewater can stoke bacterial breakdown of PFOA,

Left: Colloids, or mixtures, of negatively charged soil or sediment can trap positively charged ferrihydrite particles. Right: Ferrihydrite coated with polyacrylic acid can move easily through soil. These modified iron particles


Superfund Research Program
Science Digest
Balancing Scientific Excellence with Research Relevance
March 2022
Director's Letter | Features | Science Leadership | Hot Off the Press | Technology Profile

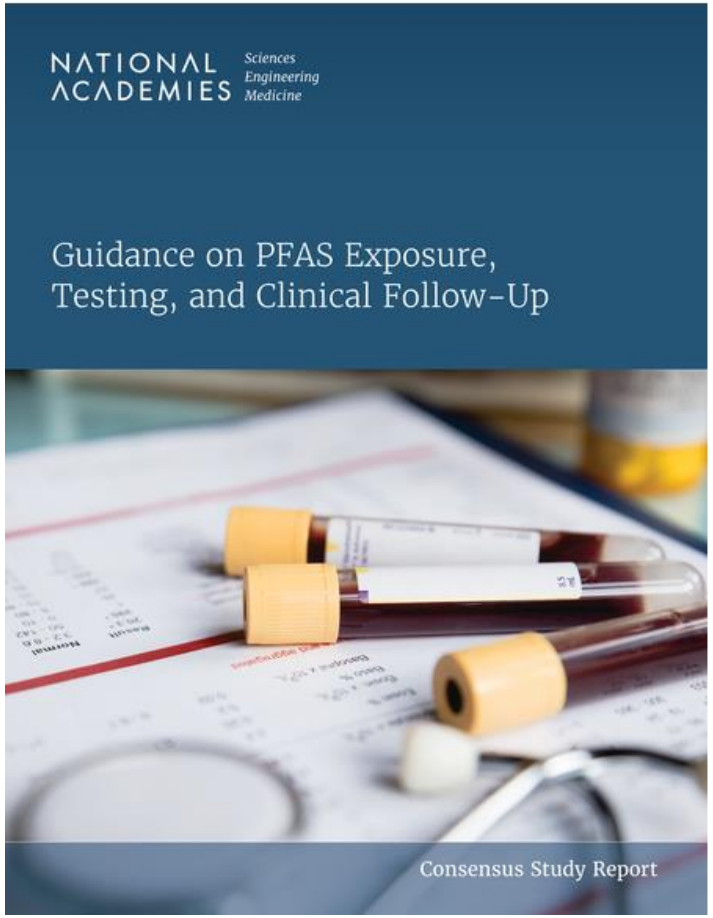

Features

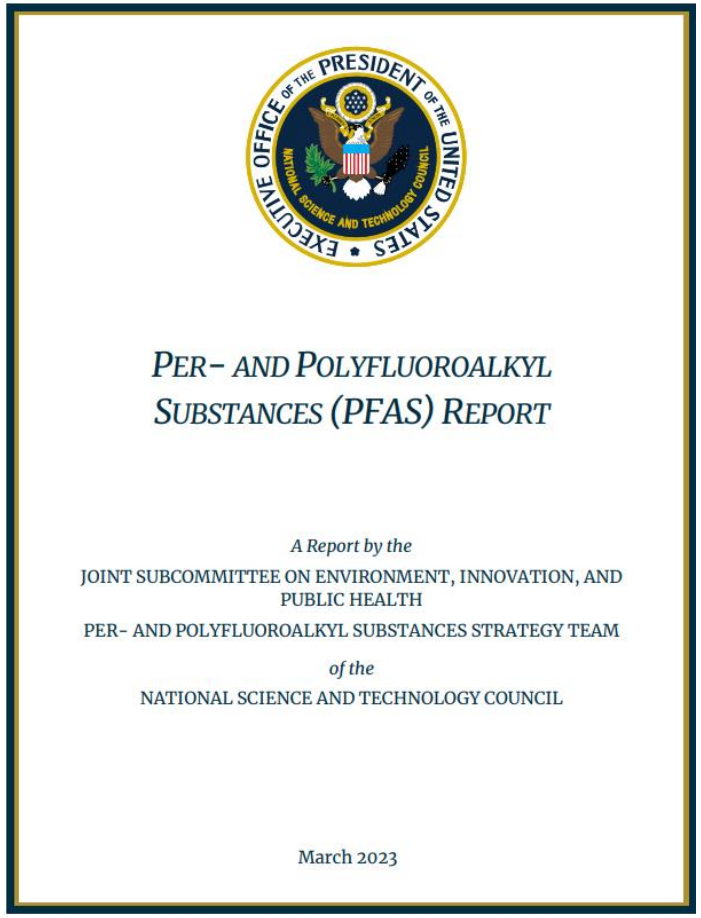
Tackling PFAS from Many Angles

NIEHS Superfund Research Program (SRP) grantees use innovative approaches to understand how people are exposed to per- and poly-fluoroalkyl substances (PFAS) and potential health effects. They study how PFAS move and change in the environment and how to clean them up to better protect human health. They also work closely with affected communities to communicate potential health risks and

SRP grantees from diverse scientific backgrounds conduct multidisciplinary research to address PFAS exposures.

Other Federal PFAS efforts with NIEHS/SRP involvement





**photos have hyperlinks*

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SRP Tools for PFAS Site Characterization

Webinar Series Snapshot

Session I – Novel Analytical Chemistry Approaches for PFAS, Oct. 6, 12:00 - 2:00 PM ET

Featuring SRP-funded investigators working on innovative methods to classify and/or quantify PFAS compounds.

Presenters: Diana Aga, Ph.D., (SUNY at Buffalo), Erin Baker, Ph.D., (UNC Chapel Hill), Lee Ferguson, Ph.D., (Duke Univ.)

Moderator: Dr. Andrea Tokranov, Research Hydrologist, U.S. Geological Survey

Session II – PFAS Sources and Mapping, Oct. 20, 2:00 - 4:00 PM ET

Presenters: Mark Brusseau, Ph.D., (Univ. of Arizona), Matt Farrell (NC State Univ.), Carla Ng, Ph.D., (Univ. of Pittsburgh)

Moderator: Mohamed Ibrahim, Ph.D., U.S. Environmental Protection Agency

Session III – PFAS Reference Materials, Libraries, and Passive Sampling, Nov. 8, 2:00 - 4:00 PM ET

Presenters: Jessica Reiner, Ph.D., (NIST), Jitka Becanova, Ph.D., (Univ. of Rhode Island), Jackie Bangma, Ph.D., (EPA)

Moderator: Suramya Waidyanatha, Ph.D., NIEHS

Visit the Risk e-Learning website for presentation descriptions, registration links, and to access the recordings: https://bit.ly/SRP-PFAS2023

Learn More About the SRP

- SRP Website Homepage
- About SRP: More about our history and mandates
- Public Health Impacts: Translational stories from basic science to impact
- Training: More about our trainees, including award winners
- Science Digest: Quarterly compilation of research, activities, and updates
- Research Briefs: Monthly research publication highlight
- Data Sharing: Dataset listing and data sharing resources
- Risk e-Learning: Regular webinar series highlighting SRP research
- Who We Fund: Includes lists of all currently funded grantees for each grant mechanism
- What's New: Recent highlights and news from the program

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