

**Strategic Environmental Research and Development Program
(SERDP)**

FY 2022 STATEMENT OF NEED

Environmental Restoration (ER) Program Area

**IMPROVED UNDERSTANDING OF THE ECOTOXICITY
OF PER- AND POLYFLUOROALKYL SUBSTANCES
IN THE MARINE ENVIRONMENT**

1. Objective of Proposed Work

The objective of this Statement of Need (SON) is to solicit proposals to develop an improved understanding of the ecotoxicity of per- and polyfluoroalkyl substances (PFAS) associated with the release of Aqueous Film-Forming Foam (AFFF) in the marine environment. Of particular importance are ecological receptors in the near-shore environment. Proposed research should focus on one or more of the following specific objectives in order to fill gaps in the current knowledge base:

- Produce data to support development of toxicity reference values (TRVs) for marine species in water and sediments for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and other relevant PFAS using controlled data from laboratory investigations. Emphasis should be on pelagic, epibenthic, and benthic invertebrate species; shellfish; and fish.
- Provide data on PFAS bioaccumulation and biomagnification from marine pelagic and/or benthic organisms into shellfish or fish that may be used to support food web modeling.
- Determine the relative toxicity of other PFAS or classes of PFAS as compared to PFOA and PFOS in order to enhance risk management decisions and address risk communication concerns.

Proposers must provide the rationale and justification for the parameters of the study, including selected species, specific PFAS, biological endpoints, and environmental media. Additionally, proposers should include a brief summary of their methodology for dosing and analyzing matrices and biota. The ecotoxicity of PFAS at environmentally relevant concentrations is of particular concern and proposed efforts should include such an assessment.

Substantial work has been conducted on understanding the ecotoxicity of specific PFAS. Investigators are encouraged to view past research and demonstrate how the proposed effort builds on previous efforts. A summary of SERDP funded efforts can be found on the [SERDP website](#).

2. Expected Benefits of Proposed Work

Knowledge of the potential environmental risk of PFAS in the marine environment will assist in the development of appropriate site-specific risk assessments and the decisions related to mitigation of exposures at these marine sites.

3. Background

PFAS such as PFOA and PFOS have been used to manufacture a variety of industrial, commercial, and military products, including (through 2001) PFOS-based fluorochemical surfactants used in AFFF, which is used to extinguish flammable liquid (e.g., hydrocarbon) fires. Environmental releases of AFFF have occurred from tank and supply line leaks, use of aircraft hangar fire suppression systems, and from firefighting training activities. Due to their chemical structure, PFAS are very stable in the environment and are resistant to biodegradation, photo-oxidation, direct photolysis, and hydrolysis. PFOA, PFOS, and other select PFAS have attracted increased regulatory scrutiny because of their resistance to degradation, ability to bioaccumulate, and growing evidence of toxicity to ecological receptors.

SERDP is actively engaged in research to develop tools to assess PFAS ecological risks. Completed and on-going projects include developing TRVs for a range of freshwater and on land receptors, as well as the compilation of TRVs from the scientific literature into tools that can be used for ecological risk assessments (*see [PFAS Ecotoxicity Risks: How SERDP is Closing the Knowledge Gaps](#)*). PFAS bioaccumulation, biomagnification, and toxicity to marine receptors remains an important information gap. On-going research under SERDP will provide some data, but in addition to PFOA and PFOS, there remains a need for uptake and toxicity data for readily bioaccumulable compounds such as perfluorohexane sulfonic acid (PFHxS), perfluorohexanoic acid (PFHXA), and perfluorobutanoic acid (PFBA), 6:2 fluorotelomer sulfonate (FTS), 8:2 FTS and other PFAS in marine aquatic environments. These compounds are frequently detected as mixtures in the environment and are of increasing interest to regulators.

4. Cost and Duration of Proposed Work

The cost and time to meet the requirements of this SON are at the discretion of the proposer. Two options are available:

Standard Proposals: These proposals describe a complete research effort. The proposer should incorporate the appropriate time, schedule, and cost requirements to accomplish the scope of work proposed. SERDP projects normally run from two to five years in length and vary considerably in cost consistent with the scope of the effort. It is expected that most proposals will fall into this category.

Limited Scope Proposals: Proposers with innovative approaches to the SON that entail high technical risk or have minimal supporting data may submit a Limited Scope Proposal for funding up to \$250,000 and approximately one year in duration. Such proposals may be eligible for follow-on funding if they result in a successful initial project. The objective of these proposals should be to acquire the data necessary to demonstrate proof-of-concept or reduction of risk that will lead to development of a future Standard Proposal. Proposers should submit Limited Scope Proposals in accordance with the SERDP Core Solicitation instructions and deadlines.

5. Point of Contact

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For Core proposal submission due dates, instructions, and additional solicitation information, visit the [SERDP website](#).