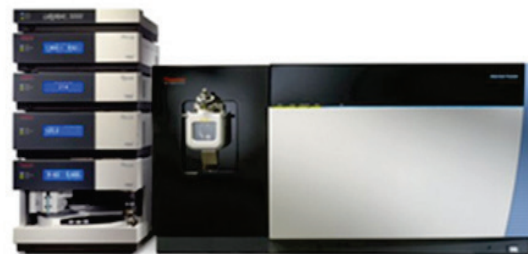
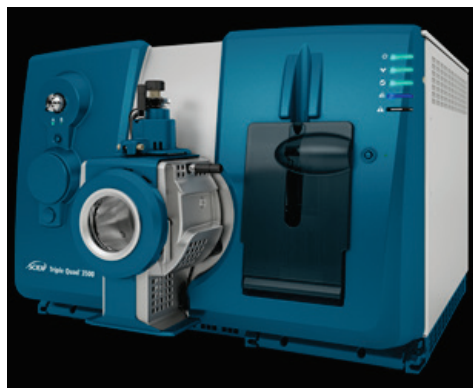




PROJECT ID:
641

Quantifying PFAS Background Levels in Environmental Media at U.S. Navy Installations



Sciex Triple Quad (left) and Thermo Fisher Scientific Orbitrap Fusion (right) certified instrumentation used to quantify PFAS following EPA defined protocols.

OBJECTIVE

The project's main objective is to quantify and define background per- and polyfluoroalkyl substances (PFAS) concentrations near non-impacted Navy sites across different environments and mediums. Currently, the Navy is being held liable for levels of PFAS that are near, or at, detection levels. Likely, these thresholds would fall within background levels. Establishing what a background is involves establishing spatial variation, identifying influencing environmental factors, proximity to key sources, and ultimately creating a scientifically defensible comprehensive dataset to define and address potential special heterogeneity and key variables in background PFAS levels.

PROBLEM STATEMENT

The global distribution of PFAS is highly heterogeneous, influenced by proximity to major sources (e.g., historical AFFF use) and regional atmospheric patterns. Given these variances, establishing a single, universal "anthropogenic background level" is scientifically inappropriate. This variability poses a critical challenge as the

regulatory landscape rapidly evolves with strict screening levels used in the CERCLA process and the EPA's recent draft Ambient Water Quality Criteria to protect human health (AWQC HH) falling below 1 ng/L. Any uncharacterized background concentration could severely impact the Navy's ability to meet these very low current and future compliance limits.

DESCRIPTION

This project addresses the complex challenge of quantifying background PFAS near Navy installations, necessitated by the highly heterogeneous global distributions and increasingly strict regulatory standards. Currently, there is a gap in knowledge about spatial variability in PFAS background levels. This study aims to address spatial variation of background levels across a multitude of non-impacted sites within proximity to a DON installation.

The project's first core task is executing a comprehensive field study across multiple environmental media—including seawater, groundwater, brackish water, and stormwater—to generate a scientifically



defensible dataset of background PFAS concentrations. Working with NAVFAC working groups, we will strategically select sites featuring diverse environmental factors. For example, a highly flushed industrial setting will be contrasted with an environmentally distinct, riverine watershed-influenced site to highlight expected variability. This variability is crucial for developing accurate, site-specific background determinations for the CERCLA Remedial Investigation process to assess the relative elevation of concentrations at impacted sites.

RETURN ON INVESTMENT

This project will deliver substantial ROI by generating a scientifically defensible, site-specific dataset that addresses a critical data gap. This protects the Navy from billions in unwarranted remediation costs by distinguishing Navy

contributions from ubiquitous background PFAS, which is crucial as 578 installations move into the remedial investigation phase. Quantifying background levels is estimated to achieve a 20% reduction in remediation costs, yielding an ROI of over \$22 million across 114 currently impacted sites.

This prevents the Navy from being held liable for off-site sources and focuses cleanup efforts where they are truly needed.

NAVY BENEFITS

New regulatory thresholds are set at or below background levels, meaning minimal anthropogenic contributions could trigger costly exceedances and lead to billions in liability for widespread, non-Navy sources. This study delivers the essential, localized dataset required to scientifically establish background levels, enabling the Navy to distinguish PFAS sources. This critical data determines reasonable regulatory thresholds

and focuses cleanup resources only where necessary.

TRANSITION DESCRIPTION

The core final products will be the publication of scientifically defensible and comprehensive background PFAS levels to peer-reviewed journals, ensuring regulators, RPMs, and technical professionals have the data and guidance necessary to establish appropriate background thresholds. These findings will be immediately usable by Navy site managers to assess liability, with project results actively disseminated through internal Navy working groups and major scientific conferences.

CONTACT

For more specific information about this project, contact the Principal Investigator at channing.e.bolt2.civ@us.navy.mil



ABOUT THE NESDI PROGRAM

The Navy Environmental Sustainability Development to Integration (NESDI) program is the Navy's environmental research and development demonstration and validation program, sponsored by Office of the Chief of Naval Operations (OPNAV) Compliance and Mission Readiness Division (N411) and managed by the Naval Facilities Engineering Systems Command (NAVFAC) from the Engineering and Expeditionary Warfare Center (EXWC) in Port Hueneme, CA.

The mission of the NESDI program is to support Fleet readiness by minimizing operational constraints associated with environmental and human health risks and to reduce cost of environmental compliance by demonstrating, validating, and integrating innovative technologies, processes, materials, and by filling knowledge gaps.

For more information, visit the program's web site at www.navfac.navy.mil/nesdi or contact the NESDI Program Managers at NESDI@us.navy.mil