



HEADLINES

DoD's Environmental Research Programs

Headlines is a quarterly newsletter highlighting the latest research and demonstration efforts to address the DoD's energy and environmental challenges.

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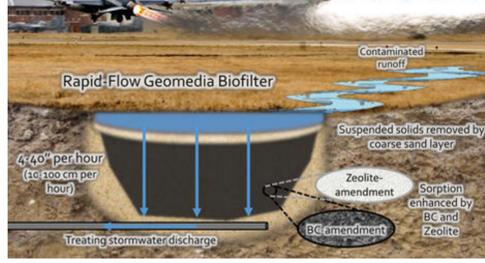
Research & Demonstration Updates

Contaminated Sediments Remediation and Management

Blog: Reducing the Impact of Stormwater Discharge on Sediment Recontamination

Stormwater discharges are regulated under federal and state permits, yet are implicated as a major cause of contamination of sediment near discharge points at or close to Department of Defense (DoD) sites. Regulators and local communities are applying increasing pressure on coastal DoD facilities to further protect water bodies by reducing the magnitude and concentration of industrial site chemicals being discharged in stormwater runoff. Conversely, for facilities in arid regions, stormwater is viewed as a "lost" freshwater resource. Opportunities for water beneficial reuse to supplement diminishing supplies exist if adequate pollutant removal can be achieved.

Ongoing SERDP research investments are geared toward monitoring tools and improving best management practices to reduce contaminant loads to water bodies, passive treatment systems to minimize or prevent sediment contamination, while critically examining these systems for opportunities to provide for freshwater harvest and beneficial reuse.



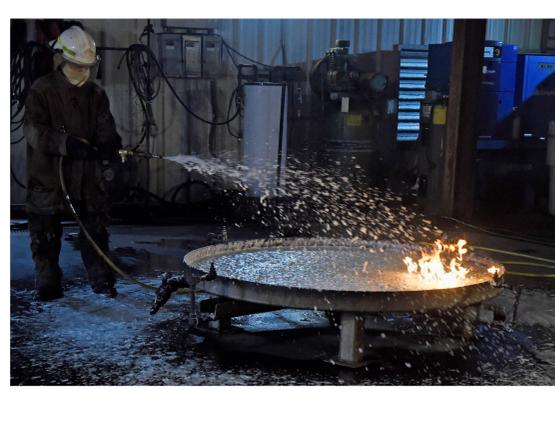
[Read more](#)

Recent Publications

- "Proof-of-Concept for the In Situ Toxicity Identification Evaluation (ITIE) Technology for Assessing Contaminated Sediments, Remediation Success, Recontamination and Source Identification" – [SERDP Final Report](#)
- "Assessing Benthic Bioaccumulation of Polychlorinated Dioxins/Furans (PCDD/Fs) and Polychlorinated Biphenyls (PCBs) in the Lower Passaic River (NJ, USA) Based on In Situ Passive Sampling" – [Journal Article](#), *Environmental Toxicology and Chemistry* ([Project Webpage](#))

PFAS Treatment and PFAS-Free AFFF Alternatives

Blog: Advancements in PFAS-Free AFFF Formulations



Firefighting formulations used for military operations on DoD installations historically contain PFAS in order to meet the performance requirements of MIL-F-24385F. However, the PFAS in aqueous film forming foam (AFFF) formulations are difficult to degrade and can migrate to groundwater, potentially posing risks to human health and the environment. To manage these risks, the DoD is working to develop alternative PFAS-free fire-suppression methods.

SERDP and ESTCP have launched a number of projects over the years to research and demonstrate viable replacements for AFFF. Our Principal Investigators are considering many different approaches to new formulations. A snapshot of some of these efforts is captured in this post.

[Read more](#)

Recent Publications

- "Innovative Nano-Encapsulated Ionic Liquid Based Surfactants for Fluorine-Free Fire Extinguishing Foams" – [SERDP Final Report](#)
- "Sublethal Effects of Dermal Exposure to Poly- and Perfluoroalkyl Substances on Postmetamorphic Amphibians" – [Journal Article](#), *Environmental Toxicology and Chemistry* ([Project Webpage](#))
- "Supervised Machine Learning for Source Allocation of Per- and Polyfluoroalkyl Substances (PFAS) in Environmental Samples," [Journal Article](#), *Chemosphere* ([Project Webpage](#))

Munitions Response Underwater

Blog: Successful Demonstration of Cut and Capture System Technology

Munitions are encountered in a variety of underwater environments as unexploded ordnance (UXO) or discarded military munitions (DMM). These items can cause unacceptable explosive risk to critical infrastructure, recreational divers and fishermen. Demilitarization of underwater munitions currently requires either in situ remediation through use of countercharges, or jet perforators placed by explosive ordnance disposal divers, or by the recovery of the hazardous ordnance for demilitarization on the surface. In situ detonation is most frequently used, but this method can destroy local marine ecosystems.

In their [ESTCP project](#), Dr. Steven Schmit and his team from Gradient Technology are evaluating the use of remotely operated high-pressure waterjets to cut open UXO and DMM as well as a capture system for the munitions constituents from ordnance that litter the ocean floors with as little disturbance of aquatic corals and sea mammals as possible.

[Read more](#)



Recent Publications

- "Portable Intrinsic Gradiometer for Ultra-sensitive Detection of Magnetic Gradient in Unshielded Environment" - [Journal Article](#), *Applied Physics Letter* ([Project Webpage](#))
- "Shallow Water Lidar for Target Morphology: Impacts of Surface Roughness and Turbidity" – [SERDP Final Report](#)
- "Demonstration of Crawler-Towed Sensor Technologies in Challenging Nearshore Sites" – [ESTCP Final Report](#)

Building Energy Efficiency Technologies

Blog: Far and Beyond Impact of ESTCP– Going from Nanofiber-based HVAC Air Filters to Face



ESTCP is currently demonstrating an innovative air filter technology that not only reduces the annual operation and maintenance cost of heating ventilation and air-conditioning (HVAC) systems, but it also delivers cleaner air to occupied spaces.

The ESTCP project "[Nanofiber-based Low Energy Consuming HVAC Air Filters](#)" led by Dr. Jayesh Doshi of eSpinTechnologies, Inc. (eSpin) is demonstrating a novel nanofiber-based HVAC air filtration system to reduce energy consumption and overall operational cost of conditioning air and air filter energy consumption by using the differential pressure across the filters, the flow velocity, the temperature and humidity of the air passing through the filters and the dust holding capacity of the filters.

Data collection is ongoing, and the Final Report is expected in early 2021, although this schedule may slip because eSpin has been busy contributing to the fight against the COVID-19 pandemic. To support the dire need for personal protective equipment across the country, eSpin has responded by applying their technology and manufacturing capacity to produce much-needed face masks for use by the frontline responders, medical community and general public.

[Read more](#)

Recent Publications

- "Demonstration of a High-Efficiency Evaporative Cooler for Improved Energy Efficiency in DoD Data Centers" - [ESTCP Final Report](#)
- "Market Aware High Performance Buildings Participating in Fast Load Response Utility Programs with a Single Open Standard Methodology" – [ESTCP Final Report](#)
- "Latent Energy Storage Systems" – [ESTCP Final Report](#)

Wildland Fire Management

Blog: Predicting Fire Behavior using FIRETEC Computational Models

Land managers use prescribed burns to clear through the excess fuels, but they still face obstacles in keeping these fires under control to decrease the risk of wildfires and sustain the forest as intended. Even the smallest fluctuations in the surrounding environment, such as changes in wind gust and topography, affect fire behavior. Current fire behavior and spread models cannot predict the complex interactions between fire and atmospheric conditions. SERDP researchers created a modeling tool to address this knowledge gap and assist fire practitioners plan prescribed burns.

Principal Investigator James Furman and his team with the U.S. Forest Service Rocky Mountain Research Station and Los Alamos National Laboratory created [FIRETEC](#), a physics-based computational fluid-dynamics model, to account for the factors influencing fire behavior ([Project Webpage](#)). By combining advanced supercomputing techniques and fire/atmosphere modeling, FIRETEC aims to predict fire behavior and the complexity of its interactions with wind speed, forest structure and different fuel types.



[Read more](#)

Recent Publications

- "Summative and Ultimate Analysis of Live Leaves from Southern U.S. Forest Plants for Use in Fire Modeling" - [Journal Article](#), *Energy & Fuels* ([Project Webpage](#))
- "Focus on Changing Fire Regimes: Interactions with Climate, Ecosystems, and Society" – [Journal Article](#), *Environmental Research Letters* ([Project Webpage](#))
- "Fire Behavior, Fuel Consumption, and Turbulence and Energy Exchange during Prescribed Fires in Pitch Pine Forests" – [Journal Article](#), *Atmosphere* ([Project Webpage](#))

Upcoming Webinars

Waste Reduction and Treatment in Armed Forces Vessels

June 4, 2020 at 12:00 PM (ET)

This SERDP and ESTCP webinar highlights results on improving waste reduction and treatment in Armed Forces vessels. Specifically, investigators will present results on new efforts to better understand emulsions in shipboard bilgewater. Two SERDP investigators present different approaches to better characterizing these emulsions so that waste reduction and treatment can be improved on Armed Forces ships.

[Learn more and register](#)

[View the full SERDP and ESTCP Webinar Series Schedule](#)

Calendar and Related Events

Related Events

June 1-3: [American Industrial Hygiene Conference 2020](#) (Virtual)

August 2-7: [Ecological Society of America 2020 Conference](#)

August 11-13: [Energy Exchange 2020](#)

December 1-3: [SERDP and ESTCP 2020 Symposium](#)

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