



# HEADLINES

Fall 2012

Meeting DoD's Environmental Challenges

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## ANNOUNCEMENTS

SERDP FY 2014 Solicitations Now Open - [Learn More](#)

2012 Projects of the Year Awarded - [See Selections](#)

New SERDP and ESTCP Resources - [Browse by](#)

## SERDP Research Funding Opportunities

SERDP is currently seeking innovative science and technology proposals to address DoD's environmental needs through several open solicitations. On October 25, SERDP released its FY 2014 Core Broad Agency Announcement (BAA) and Federal Call for Proposals and the FY 2014 SERDP Exploratory Development (SEED) Solicitation. More information is provided in the SERDP and ESTCP Program Update below.

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## Cold Spray Technology for Aircraft Component Repair

Corrosion of transmission and gearbox housings made with magnesium alloys is a significant concern for DoD. With no existing technology that can adequately restore these components, corroded housings must be removed from rotorcraft, often prematurely, and scrapped. It is estimated that premature failures of these components cost DoD approximately \$100 million per year. ESTCP investigators have demonstrated a novel cold spray process that involves accelerating aluminum alloy particles to high velocities and impacting them on the surface of magnesium alloy components to provide surface protection and restore components that have been removed from service. The technology has already been implemented by the Sikorsky Aircraft Company and approved by the Army Program Office for use on one UH-60 Blackhawk helicopter magnesium component, with additional approvals expected soon.

For this important work, **Mr. Victor Champagne** of the U.S. Army Research Laboratory and his team were selected to receive a 2012 ESTCP Project-of-the-Year Award. [Full Article](#)



## Program Area

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### CALENDAR

**January 8:** Pre-Proposals Due for the SERDP Core Solicitation

**January 15:** SERDP and ESTCP Quarterly Progress Reports Due

**March 12:** Proposals Due for the SERDP SEED Solicitation

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### RELATED EVENTS

**March 4-6:** RemTEC Summit (Westminster, Colorado)

**February 4-7:** Seventh International Conference on Remediation of Contaminated Sediments (Dallas, Texas)

**February 25-27:** ARPA-E Energy Innovation Summit (Washington, D.C.)

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### KEEP IN TOUCH

**Phone:** (571) 372-6565

**Web:** [www.serdp-estcp.org](http://www.serdp-estcp.org)



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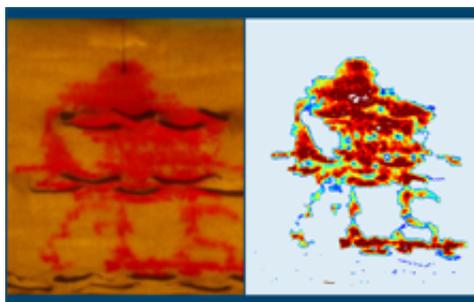


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## Source Zone Architecture Key to DNAPL Remediation

Groundwater contamination from chlorinated solvents on military installations is a significant environmental liability for DoD. Many dense nonaqueous phase liquid (DNAPL) source zones developed decades ago as a result of historical practices and continue to contaminate groundwater today. To successfully treat this contamination, it is essential to understand the physical characteristics of the source zones. SERDP researchers have developed innovative field tools that for the first time can provide key information about a source zone's architecture, namely its ganglia to pool ratio. This work, which combines high-end computational techniques and physical models, can help explain why contamination persists, determine how long it will persist, and identify the best treatment options.

For this outstanding work, **Drs. Linda Abriola, Eric Miller, Kurt Pennell,** and **C. Andrew Ramsburg** of Tufts University, together with **Dr. John Christ** of the U.S. Air Force Academy were selected to receive a 2012 SERDP Project-of-the-Year Award. [Full Article](#)



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## Ecological Research Supports Training at Camp Lejeune

Camp Lejeune, in North Carolina, is both a critical Marine Corps installation and home to a dynamic and diverse set of ecosystems. Traditionally, each part of an installation's ecosystem has been studied as an individual entity. But in reality, all the parts of the ecosystem on an installation are connected. In turn, environmental changes can affect training over the long term. Installation land managers responsible for thousands of acres of diverse and interconnected ecosystems need long-term monitoring data across large spatial scales to understand ecological trends and potential impacts from human-induced stressors. SERDP's Defense Coastal/Estuarine Research Program (DCERP) is providing these data and analyses, using mission-relevant research to produce ecosystem-based management tools that will enable the military both to continue using coastal installations for essential training and testing and to sustain the environmental health of these coastal areas. This unprecedented multi-year interdisciplinary ecological research program at Camp Lejeune serves as a model for ecological research management by bringing together participants from multiple institutions and disciplines to work for several

years at the landscape scale and ensuring the research is linked to practical management questions.

For this impressive work, **Dr. Patricia Cunningham** of RTI International and the extensive DCERP Team were selected to receive a 2012 SERDP Project-of-the-Year award. [Full Article](#)

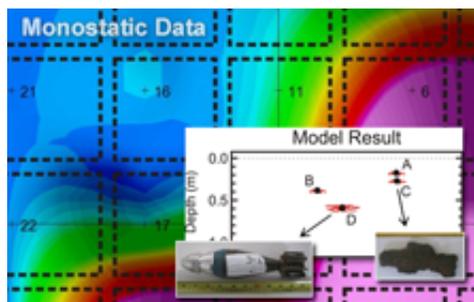


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## Leveraging Advanced Sensor Data to Clean Up UXO

DoD is responsible for thousands of sites contaminated with military munitions covering millions of acres. With current practice, sensors detect more nonhazardous metal objects than munitions and have no ability to identify the source of a signal. As technologies are developed to distinguish buried munitions from other metallic clutter, a persistent challenge has been distinguishing between the two when objects are adjacent or overlap. SERDP researchers have exploited data from advanced sensors such as MetalMapper and TEMENTADS in developing a software tool that can determine the presence of multiple objects and whether they are UXO or clutter, essentially producing a three-dimensional representation of the objects buried under the ground. This new software tool is already being used in live site demonstrations and will be available shortly for production use. In combination with other advances, the technology will allow for a multibillion dollar reduction in the costs of UXO remediation.

For this significant work, **Dr. Dean Keiswetter** and **Mr. Jonathan Miller** from SAIC received a 2012 SERDP Project-of-the-Year Award. [Full Article](#)



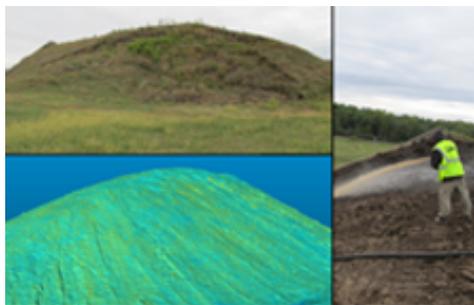
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## Biopolymers Maintain Training Berms, Prevent Contamination

Berms are an important component of military training

complexes, but their use can present environmental and regulatory challenges for installations, depending on the physical and chemical properties of the soil and the proximity of the berm to sensitive environmental receptors. For example, the berms can erode and, as a result, the heavy metals and toxic chemicals from the munitions can leach out of the soil into the surface water and groundwater. The products traditionally used to prevent this erosion are petroleum-based polymers, which themselves can harm the environment. ESTCP investigators have demonstrated new and innovative biopolymers that can be used to prevent berm erosion as effectively as the petroleum-based products. In fact, the biopolymers also improved absorption of heavy metals, suppressed dust, and improved plant growth. These natural biological products will enable range managers to minimize berm maintenance and prevent pollution using an approach that fits well with the way the Department of Defense manages its training ranges.

For this achievement, **Dr. Steven Larson** and **Dr. J. Kent Newman** of the U.S. Army Engineer Research and Development Center, **Mr. Gregory O'Connor** of the U.S. Army PM-Joint Services, and **Mr. Gary Nijak, Jr.** of ETS Partners were selected to receive a 2012 ESTCP Project-of-the-Year award. [Full Article](#)



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## Rare-Earth Corrosion Protection Mechanisms

For decades, DoD has used coating systems that contain hexavalent chromium (Cr(VI)) in the form of chromates to prevent corrosion on military weapons systems, particularly aircraft. Because chemical compounds containing Cr(VI) are toxic and carcinogenic, in 2009 DoD initiated a policy to eliminate where possible their use as long as there was no loss in performance. In recent years, rare-earth compounds have shown promise as environmentally benign corrosion inhibitors in conversion coatings and primers. Still, the exact mechanisms by which these alternatives work remained unknown, limiting their usefulness. SERDP researchers have made fundamental discoveries in understanding how rare-earth compounds containing cerium or praseodymium inhibit corrosion. Their research determined that the appropriate phase of a rare-earth compound has to be incorporated into the proper type of coating to provide corrosion protection in specific environments. The results will provide direction for further development of rare-earth compounds as surface treatments and coatings for the military that will reduce the use of toxic Cr(VI) compounds while providing

corrosion protection.

For this groundbreaking work, **Dr. Bill Fahrenholtz** and **Dr. Matt O'Keefe** of the Missouri University of Science and Technology together with **Dr. Eric Morris** of Deft, Inc. were selected to receive a 2012 SERDP Project-of-the-Year Award. [Full Article](#)



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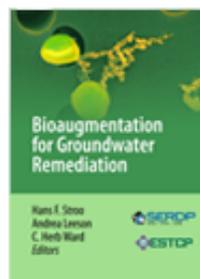
## New Corrosion-Resistant Steel Excels in U.S. Air Force Field Service Evaluation

A new ultra-high-strength, corrosion-resistant steel, developed with SERDP and ESTCP support, is making its way to real-world aerospace applications. A recently completed U.S. Air Force field service evaluation of two main landing gear pistons made from Ferrium S53 has shown that the new alloy exceeds conventional steels in terms of corrosion protection, without the need for a hazardous cadmium coating. The pistons were primed and painted, but not coated with cadmium. They were tested on a T-38 aircraft and compared to cadmium-plated, primed, and painted 4340 pistons. The 19-month evaluation, encompassing more than 500 landings, showed that in addition to providing general corrosion protection, the S53 steel also was more resistant to stress corrosion cracking, fatigue, corrosion fatigue, and grinding burn than the 4340 steel. Although redesigned 4340 pistons were ultimately selected for the T-38 gears, this field service evaluation demonstrates the significant potential for use of S53 steel on future aircraft components. [Full Article](#)

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## Bioaugmentation Resource for Environmental Remediation Professionals

*Bioaugmentation for Groundwater Remediation*, the fifth installment in a Remediation Technology Monograph Series, reviews the past 10-15 years of research and development that have led to bioaugmentation becoming an effective and accepted remedial technology. Decision-making processes for implementing bioaugmentation, design and cost considerations, and monitoring options are covered. This latest monograph was written by several leading experts



from academia and industry and edited by Dr. Hans Stroo of Stroo Consulting, LLC, Dr. Andrea Leeson of SERDP and ESTCP, and Dr. C. Herb Ward of Rice University. It will serve as a reference for environmental remediation professionals seeking to understand, evaluate, and implement bioaugmentation. [Full Article](#)

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## Workshop Identifies R&D Needs for the Long-Term Management of Contaminated Sediments

Environmental restoration and closure of contaminated sediment sites is a top priority for the Department of Defense. Over the next five to ten years, identifying methods to establish long-term remedy success, reducing long-term management costs, and achieving site closure will be of primary concern. In July 2012, SERDP and ESTCP convened a workshop on *Research and Development Needs for Long-Term Management of Contaminated Sediments* to address these site management priorities. The objectives of the workshop were to (1) examine the current state of the science and technology for the restoration of contaminated sediment sites, (2) review the current and projected future status of DoD restoration activities, (3) identify data gaps that, if addressed, could aid in the restoration of contaminated sediments, and (4) prioritize research and demonstration opportunities to help facilitate regulatory and public acceptance of restoration of contaminated sediment sites. Based on the results of this workshop, SERDP is now soliciting proposals for research to improve understanding of the impact of ongoing, low level contaminant influx to aquatic sediment sites that are either undergoing restoration or are in the long-term monitoring phase, and to develop tools to assess and manage such impacts. Other research and demonstration, and technology transfer needs identified are described in the workshop report. [Full Article](#)

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## SERDP and ESTCP Program Update

### SERDP

Proposals selected in response to the FY 2013 SERDP solicitations were presented to the SERDP Scientific Advisory Board (SAB) for review at its September and October 2012 meetings. The SAB recommended for funding 34 projects from the Core Solicitation and three projects from the SERDP Exploratory Development (SEED) Solicitation. In late September, the SERDP Council met and approved the FY 2013 Program Plan. [SERDP FY 2013 New Start Project Selections](#)

**Open Solicitations:** On October 25, SERDP released its annual solicitations for FY 2014. Proposers from the private sector may respond to the Broad Agency Announcements (BAAs) and those from the federal sector to the Federal Call for Proposals. The Statements of Need (SONs) for the FY 2014 Solicitations are listed below. Private and Federal sector pre-proposals

responding to the FY 2014 Core Solicitation are due **January 8, 2013**. All pre-proposals must be submitted directly to SERDP via the Web Proposal Tracking System (WebPTS). Full proposals responding to the FY 2014 SEED Solicitation are due on **March 12, 2013**. Visit [www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations](http://www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations) for the solicitation instructions and schedule for proposal submission.

## **FY 2014 SERDP Statements of Need**

### **Environmental Restoration**

Improved Remediation Operation Through Fine Scale Delineation of Contaminated Subsurface Environments

In Situ Remediation of Perfluoroalkyl Contaminated Groundwater

Improved Understanding of the Impact of Ongoing, Low Level Contaminant Influx to Aquatic Sediment Site Restoration

### **Munitions Response**

Detection, Classification, and Remediation of Military Munitions Underwater

Detection, Classification, and Remediation of Military Munitions Underwater (SEED)

### **Resource Conservation and Climate Change**

Recovery of Ecological Processes Impacted by Non-Native Invasive Species in the Pacific Islands

Climate Change Impacts to Built Infrastructure in Alaska

### **Weapons Systems and Platforms**

Environmentally Sustainable Gas Generators and Mono/Bi-Propellants

Development of Replacements for Polyimide Composite Materials Containing Methylene Dianiline (MDA)

Full Scale Military Tactical Aircraft Engine Noise Source/Mechanism Identification

Environmentally Sustainable Binder Systems for Energetic Materials (SEED)

## **ESTCP**

In September, as part of the FY 2013 Environmental and Energy Solicitations process, those who were requested to submit full proposals presented their proposed work to the ESTCP Technical Committees (ETCs). The ETCs made recommendations to the ESTCP Director, who

selected projects to be funded in FY 2013, including 29 projects from the Environmental Technologies solicitation and 22 projects from the Installation Energy solicitation. **ESTCP FY 2013 New Start Project Selections — Environmental; Energy**

**Upcoming Solicitations:** The FY 2014 ESTCP Solicitations will be released in early 2013. Watch [www.serdp-estcp.org/Funding-Opportunities/ESTCP-Solicitations](http://www.serdp-estcp.org/Funding-Opportunities/ESTCP-Solicitations) for details.

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Strategic Environmental Research and Development Program (SERDP)  
Environmental Security Technology Certification Program (ESTCP)  
Phone (571) 372-6565 - Fax (571) 372-6386  
4800 Mark Center Drive, Suite 17D08, - Alexandria, VA 22350

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