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Adapting to Climate Change: Aiming for an “Apollo 13” Moment

Symposium & Workshop Again Draws Record Attendance

In his dual role as Director of the Navy’s Task Force on Climate Change and Oceanographer and Navigator of the Navy, Rear Admiral David Tittle, Ph.D. spends much of his time delving into the complexities of climate change. He and other task force members review and assess scientific studies and demonstration projects to determine the potential ramifications for the military’s operations in the United States and around the globe. Still, it is not studies or computer models that provide Rear Admiral Tittle with the vivid images he uses to describe the challenges Americans face regarding climate change. It’s the movies—albeit, one based on real-life events.

“We have a choice. We can either do the ‘Thelma and Louise’ thing and keep the gas pedal mashed on carbon dioxide and hold hands and see what happens,” Rear Admiral Tittle said. “Or, we could have an ‘Apollo 13’ moment, in which although we are in some very difficult and seemingly intractable situations, through ingenuity, dedication, leadership, and the work of our country, we together will find a way to not only mitigate and adapt to changing climate, but in the end we will come out better than when we started.”

Rear Admiral Tittle spoke at the opening plenary session of the annual Partners in Environmental Technology Technical Symposium & Workshop, hosted by SERDP and ESTCP in Washington, D.C.,

November 30 – December 2, 2010. Breaking attendance records once again, more than 1,200 environmental professionals from the military, government agencies, academia, private industry, and the regulatory community participated in this conference.

One factor that gives Rear Admiral Tittle hope that the United States will follow the Apollo 13 approach is the extensive



Rear Admiral David Tittle, U.S. Navy, addresses record-breaking crowd at Symposium & Workshop.

collaboration with other nations that he sees in his work on the Navy’s Task Force on Climate Change. He cites as examples

American and international colleagues’ work studying the potential effects of climate change on the Arctic and maritime activity and on global sea level rise.

“We need to be smart about how we leverage everybody’s knowledge and resources because at the end of the day, this is a challenge that is bigger than the Navy, and even bigger than the Department of Defense,” Rear Admiral Tittle said. “This is a global challenge.”

Mr. Lenny Siegel, Executive Director of the Center for Public Environmental Oversight (CPEO), also emphasized collaboration, in this case between the U.S. military and environmental groups—organizations that have been considered adversaries in the past. CPEO promotes and facilitates public participation in the oversight of environmental activities at federal facilities, including DoD installations.

CONSERVATION

DoD conducts its training and testing activities on roughly 30 million acres of land, which encompasses a variety of ecosystems, and also operates over much broader areas of the marine environment. To accomplish these activities and maintain military readiness requires a sustainable resource base and compliance with environmental requirements. Judicious conservation of its natural and other resources enables DoD to maintain realistic training and testing environments now and into the future.

The goal is sustainable human activities, which are in the end dependent on ecosystems that maintain their ecological functions and continue to provide desired benefits or services, known as ecosystem services. For DoD, sustainability means the ability to conduct its military missions in perpetuity while being a responsible steward of the resources—natural, cultural, and built—under its care and responsibility.

In particular, SERDP and ESTCP investments assist the Department with the conservation of its natural resources. The Programs focus on those ecosystems on which the military depends to conduct its operational, training, and testing missions, but they also investigate cross-cutting issues such as invasive species and the use of fire as a management tool.

SERDP and ESTCP are developing and demonstrating the science, tools, and techniques needed to manage natural resources in a sustainable manner on installations and training and testing ranges. Ongoing activities cover a broad spectrum of topics as described here.

For more information on this newly featured initiative and associated projects, visit [Featured Initiatives > Conservation](#) at www.serdp-estcp.org.

Defense Coastal/Estuarine Research Program



Critical military training and testing lands in coastal and estuarine areas are increasingly placed at risk because of development pressures in surrounding areas, impairments due to other anthropogenic disturbances, and requirements to comply with environmental regulations. DoD desires to enhance and sustain its training and testing assets and to optimize its stewardship and conservation of natural resources through an ecosystem-based management approach. To expand its commitment to improving military readiness while demonstrating the science behind ecosystem-based management on DoD facilities, SERDP is supporting the Defense Coastal/Estuarine Research Program (DCERP) at Marine Corps Base Camp Lejeune in North Carolina. This suite of integrated, long-term research and monitoring projects supports the sustainability of military training and testing in ecologically and economically important ecosystems.

Ecological Forestry



DoD uses and manages an extensive and diverse acreage of forested landscapes. These landscapes provide the physical backdrop against which DoD trains its personnel and tests military equipment. These forested ecosystems also provide habitat for a multitude of species and various ecosystem services. Appropriate management enables DoD to sustain its

use of the land and also meet its stewardship obligations. To accomplish forest management, DoD follows the principles of ecological forestry.

Marine Mammal Ecology and Management



Improved understanding of the ecology of marine mammals is a vital prerequisite to enable the U.S. Navy to meet its operational training and testing objectives in an environmentally responsible and legal manner. Research provides regulatory agencies and the Navy with scientifically defensible information to assess, monitor, and mitigate the impacts of naval anthropogenic sound on living marine resources, in particular marine mammals. Indeed, information derived from behavioral response studies, when combined with other information such as baseline behavioral ecology, population density estimates, habitat associations, and seasonal occurrence patterns, will provide a more complete picture of how marine mammals respond to sounds in their environment and enable the Navy to meet its mission objectives while safeguarding the individual and population health of marine mammals.

Brown Tree Snake (*Boiga irregularis*)



The inadvertent introduction of the brown tree snake to Guam, probably conveyed in ships that transported salvaged war material after World War II, has had far-reaching consequences. Ecologically, it has resulted in the extirpation of most of the island's native terrestrial vertebrates. The mildly

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venomous snake also presents a health hazard to small children. Its economic impact ranges from electrical blackouts to delays in shipping. Because of the significant ecological and economic damage caused by the brown tree snake on Guam, as well as its direct and indirect impact on military missions, the potential for the snake to be spread to other Pacific Islands is of grave concern.

Fire



Prescribed burning on military lands is a critical natural resource management activity employed by DoD land managers within fire-adapted ecological systems. Prescribed

burning is used to maintain and restore native ecological systems and the biotic components, including listed and at-risk species that are dependent on fire as an ecological process. Military lands also are prone to fires from training activities. The air quality impacts associated with these fires can be the source of complaints from surrounding landholders and communities. ♦

SYMPOSIUM, from front page

“People frequently ask me, how did a leftwing, tree-hugging, antiwar activist from the island of



Mr. Lenny Siegel, Center for Public Environmental Oversight

California become an advocate for partnership with the Defense Department in solving environmental problems?” said Mr. Siegel.

The short answer: because collaboration works. “I’ve learned over the years it is possible to talk to people who are supposedly your adversaries and sometimes—not all the time—come up with solutions that benefit both sides,” he said.

Of particular interest to SERDP and ESTCP is the role local residents can play in supporting and promoting innovative environmental technologies. “I’ve found the public is a force for the kinds of technologies the people in this room are trying to develop, test, and implement,” Mr. Siegel said. In his experience, he explained, the military and the regulators tend to be the ones resistant to trying new approaches. “These community groups can be the advocates that get the new technology to the field, get it tested and hopefully

implemented, so we get more of the stuff out of the ground, reduce the risk, and stop spending so much energy and money on cleanup,” he said.

Dr. Paul Anastas, the Environmental Protection Agency’s Assistant Administrator of the Office of Research and Development and the Science Advisor to the Agency, urged Symposium & Workshop participants to “think big” as they work to achieve environmental sustainability.

“If we continue to focus on making things less bad, on solving the problems of the 1970s, then we’re not going to make the kind of leapfrog innovations required for sustainability,” he said. “It’s going to take all of us thinking differently and broadly.”



Dr. Paul Anastas, U.S. EPA

As an example, Dr. Anastas cited coffee decaffeination, which was originally achieved using methylene chloride, a toxic compound. More environmentally friendly approaches using carbon dioxide were developed; however, the real innovation was in developing coffee beans that didn’t contain caffeine in the

first place. “One of the key concepts for any given product or service is, you want to have every performance capacity of the product without the product itself,” he challenged attendees.

Project-of-the-Year Awards Showcase Program Successes and DoD Benefits

Dr. Jeffrey Marqusee, Executive Director, and Dr. Anne Andrews, Deputy Director, presented four SERDP and two ESTCP Project-of-the-Year Awards at the conclusion of the plenary session to recognize research and technology developments with significant benefits to DoD.

SERDP Project of the Year for Environmental Restoration (ER). Elucidation of the Mechanisms and Environmental Relevance of cis-Dichloroethene and Vinyl Chloride Biodegradation (ER-1557).

Mr. Evan Cox (Geosyntec Consultants, Inc.), Dr. James Gossett (Cornell University), Dr. James Spain (Georgia Institute of Technology), and their colleagues identified and explained how chlorinated solvents in groundwater can continue to degrade through biological processes even on sites that appear to lack the characteristics necessary for such processes to occur.

See SYMPOSIUM, page 4



SERDP ER Project of the Year
Mr. Evan Cox (center), Dr. James Gossett (right),
and Dr. James Spain

Chlorinated solvents are the most common source of contaminated groundwater on DoD lands. Most DoD sites are cleaned up by either introduced or natural biological processes that break down these contaminants to the point where the harmful chemicals are fully degraded and the site is remediated. But at a significant number of sites, the process appears to stall at a point where the solvents have been degraded into the toxic chemicals cis-dichloroethene (DCE) and vinyl chloride (VC). The possible routes and rate for the continued degradation of these chemicals have been a subject of great debate in the scientific literature with significant economic and risk consequences.

These researchers succeeded in identifying the organisms and elucidating the pathways by which these toxic chemicals may continue to break down at these sites. Through a series of elegant experiments, they determined that micropockets of oxygen, at very low concentration, do in fact exist in the subsurface at sites that appear to be anaerobic, thus resolving this longstanding scientific question.

This knowledge will directly reduce DoD costs for cleaning up chlorinated solvent sites and improve management of these sites. Managers will now be able to predict with confidence if a site will continue to remediate itself or if they need to introduce other processes to fully degrade these toxic chemicals.

SERDP Project of the Year for Weapons Systems and Platforms (WP). *Chromium Elimination in Medium Caliber Gun Barrels (WP-1426).*

Mr. Mark Miller (U.S. Army Benet Laboratories) and colleagues developed a method for gun manufacturing that eliminates a hazardous workplace risk, reduces costs, and improves weapons performance.



SERDP WP Project of the Year
Mr. Mark Miller (left of center) and his team

Medium caliber gun barrels such as those mounted on trucks and helicopters historically have been made using chromium as a coating on the interior bore surfaces. This hard surface protects against propellant gases and wear and tear from projectiles when the gun is fired. Although the coating provides the desired properties, the hexavalent chromium used in the plating process is a known carcinogen, requiring time-consuming and expensive precautions that protect workers, as well as incurring substantial disposal costs.

Mr. Miller and his team developed a new method for applying an environmentally benign tantalum-tungsten coating onto the interior surfaces of the gun barrels using an innovative explosive bonding process. Their work combined fundamental engineering, high-end computational modeling, and experimental research.

In addition to eliminating hazardous workplace exposure to hexavalent chromium and reducing costs, this new coating has the potential to enhance the military mission. Tests show that tantalum-tungsten-lined gun barrels last

three times as long as chrome-plated tubes. This increased performance provides the basis for developing more effective weapons in the future.

SERDP Project of the Year for Resource Conservation and Climate Change (RC). *Realizing the Potential of the Effective Area Model: Refining the Software and Incorporating Recent Advances to Maximize Usefulness on Military Installations (RC-1597).*

Dr. Thomas Sisk (Northern Arizona University) and Dr. Leslie Ries (University of Maryland, College Park) together with their colleagues developed a modeling tool for DoD installation managers to manage land use and habitats in a way that improves both mission sustainability and conservation planning.



SERDP RC Project of the Year
Dr. Thomas Sisk and Dr. Leslie Ries

Military installations serve as the platform for meeting the Department's national security mission. The natural resources on these installations are critical to that mission. DoD has a responsibility to the nation to preserve the species that reside on the landscape and a responsibility to sustain a variety of landscapes for military training.

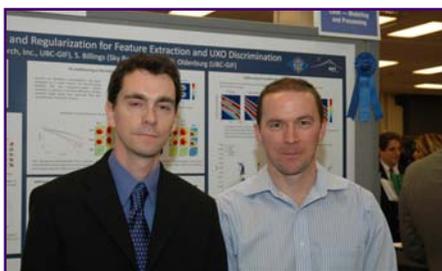
These military installations often include a range of landscapes, from patches of pristine forest to open fields to parcels of lands heavily impacted by use. How birds and other animals interact with these landscapes depends not only on the type of landscape and its size but also on its configuration—on the areas where these varied landscapes connect or the edges.

Dr. Sisk and Dr. Ries applied a fundamental understanding of various animals' responses to edges to develop a practical and user-friendly approach to managing multiple species on varied landscapes within a military site. The resulting tool combines a landscape model that links field and remotely sensed data to assess impacts of land use strategies on animal populations and an ecologically based multispecies modeling approach to threatened, endangered, and at-risk species management.

This tool enables researchers and land managers to collaborate in determining the effects of habitat fragmentation, restoration, and management practices on multiple species and to translate that understanding to planning and on-the-ground management.

SERDP Project of the Year for Munitions Response (MR). Robust Statistics and Regularization for Feature Extraction and UXO Discrimination (MR-1629).

Dr. Stephen Billings (Sky Research, Inc. and University of British Columbia) and colleagues developed robust statistical methods and modeling techniques for improving unexploded ordnance (UXO) classification and discrimination.



SERDP MR Project of the Year
Dr. Stephen Billings (right) and team member
Dr. Laurens Beran

DoD's liability for munitions response is estimated in the tens of billions of dollars. With resources constrained, munitions response actions on many sites are forecast to be decades out. One of the most promising technology advances for reducing the cost per site and accelerating the pace of cleanup is

in the use of classification to distinguish the buried UXO from the vast quantity of harmless pieces of metal found on any site, allowing resources to be directed to real risk reduction.

Key to UXO classification is the ability to fit geophysical data to a model that accurately represents parameters of a physical object. Such parameters include the object's length and shape and the material it is made of. Complicating the task are real-world factors, such as surveying over uneven ground, that affect the quality of data that can be collected in the field.

Dr. Billings and his team combined fundamental understanding of the underlying physics with their experience in the practicalities of gathering field data to develop robust statistical methods and modeling techniques that will improve parameter estimates and ultimately provide DoD with significant improvements in its ability to distinguish between UXO and harmless metal objects.

ESTCP Project of the Year. Low VOC/HAP Compliant Resins for Military Applications (WP-200617).

Dr. John La Scala (U.S. Army Research Laboratory) and his colleagues demonstrated and validated the use of more environmentally benign composite materials for high-performance military applications.

The military is rapidly moving to increasingly advanced composite materials that offer great advantages over traditional materials such as steel. But as these new lightweight and high-performance composite structures are exploited for military applications, the environmental consequences associated with their applications need to be reduced. Current liquid resins are a significant source of hazardous air pollutant (HAP) emissions. As a result, extensive and costly measures are required to protect workers from being exposed to these harmful chemicals.

Dr. La Scala and his team demonstrated and validated low-HAP resins for the manufacture and repair of composite components used in military applications. These components include ballistic hardtops for the Marine Corps Humvees, hoods for Army vehicles, and an F-22 canopy cover for the Air Force.



ESTCP Project of the Year
Dr. John La Scala

Their work has shown that these resin formulations meet the critical military requirements and that the green, low-HAP composites have improved weatherability and durability relative to the baseline composites. These composites will significantly decrease worker exposure during manufacturing and minimize the expense and time associated with managing permits and air pollution recovery units.

ESTCP Project of the Year. MetalMapper: A Multi-Sensor TEM System for UXO Detection and Classification (MR-200603).

Dr. Mark Prouty (Geometrics) and his team developed and commercialized MetalMapper, a time-domain electromagnetic system that transmits and receives on multiple axes to provide a much richer data set that can be exploited for UXO classification.

Commercially available geophysical sensors generally used for munitions response were developed for other applications and offer only a limited amount of information that can be used



ESTCP Project of the Year
Dr. Mark Prouty (left) and team members

for classification to distinguish buried UXO from harmless pieces of metal found on a site. In MetalMapper, Dr. Prouty and his team developed a purpose-built sensor for munitions classification. The technology builds on many years of combined efforts of scientists in university, government, and industry laboratories conducting fundamental research that provided the basis for the sensor system.

MetalMapper is now being demonstrated at former military sites across the nation in collaboration with state and federal regulators. The deployment of MetalMapper can dramatically improve and accelerate DoD's ability to effectively remediate former military sites, reducing risks to the people who use and live on these sites and enabling redevelopment of these lands.

Technical Program Offers Timely Updates, Training, and Collaboration Opportunities

Following the opening plenary session, attendees participated in the technical program, which offered a selection of 14 technical sessions and three short courses. Technical sessions highlighted research and innovative technologies that are helping DoD address increasingly complex environmental and mission sustainability challenges such as energy efficiency, vapor intrusion, hexavalent chromium alternatives, sustainability of forward operating bases, underwater military munitions, and climate change vulnerabilities and impacts. Short courses provided unique training opportunities on emerging technologies and methods in environmental restoration and munitions response.

Over the course of the two-and-a-half day conference, attendees also took advantage of the many opportunities to meet with colleagues, exchange

information, and tour the Exhibit Hall, which featured approximately 475 poster presentations and 13 booths showcasing technologies and scientific advancements from a variety of environmental research programs.

Presentations from the plenary session, technical sessions, and short courses are available at www.serdp-estcp.org/symposium2010/. Coming soon to the web site are webcasts from the three short courses—*Advances in Classification Methods for Military Munitions Response*, *Principles and Practices of In Situ Chemical Oxidation*, and *Measurement and Use of Mass Discharge and Mass Flux at Contaminated Sites*.

Planning is now under way for the 2011 Symposium & Workshop to be held November 29 – December 1, 2011, at a new location — the Washington Hilton in Washington, D.C. Watch www.serdp-estcp.org/symposium for details. By the end of May, the Call for Poster Abstracts will be released with abstracts due July 29. ♦



The 2010 Symposium & Workshop technical program offered 14 technical sessions and three short courses that encouraged audience participation and follow-on discussion. In the Exhibit Hall, 475 poster presentations and 13 booths fostered information sharing and collaboration among the more than 1,200 attendees.



Symposium & Workshop photos by Craig Kellstrom

Workshop Highlights Recent Advances in Sustainable Surface Engineering for Aerospace and Defense

ASETSDefense 2011: Sustainable Surface Engineering for Aerospace and Defense was held in New Orleans, February 7-10, 2011, with a record attendance of more than 240 engineers representing DoD, prime contractors, and suppliers. Sponsored by SERDP and ESTCP, the workshop focused on environmental safety and occupational health (ESOH) and life-cycle cost issues relevant to application of surface engineering technologies for the production and sustainment of aerospace and defense systems, including aircraft, vehicles, ships, and electronics. Workshop sessions assessed alternatives to hexavalent chromium (Cr⁶⁺, chromate), beryllium (Be), cadmium (Cd), and volatile organic compounds (VOCs). Other sessions highlighted alternative technologies used to protect light metals and electronics, new accelerated corrosion test methods, and coating removal technologies.

A special side meeting on February 6 covered computational and database methods for materials design and corrosion prediction, especially for galvanic corrosion. Both the Office of Naval Research (ONR) and Naval Air Systems Command (NAVAIR) have developed a vision for a predictive galvanic corrosion technology integrated with software to design corrosion out of new systems. At the same time, original equipment manufacturers (OEMs) such as Boeing have been developing both engineering and basic science approaches. In the last few years new computational models have become commercially available for materials development and galvanic protection, databases have been developed that can provide the data for input to those models, and a

new approach to galvanic data acquisition has begun to be developed to replace the galvanic series that has been used for the last half century. Briefings were provided by ONR, NAVAIR, the Marine Corps, Boeing, Elsyca, and Questek.

The workshop itself opened with presentations discussing how domestic initiatives such as the OSD-ATL Cr⁶⁺ Minimization Memorandum and international regulations such as REACH are affecting DoD operations and the supply chain and how DoD and suppliers can effectively respond to these regulations. Presenters from the Services and OEMs in the United States and Europe described current issues related to surface protection being created by REACH, such as loss of critical materials from the supply chain and very short lead times for finding and qualifying alternatives. They described efforts to address these concerns in the short term and to develop a long-term approach.

Presentations then focused on solutions to the issues DoD is facing with respect to surface protection on weapons systems. Representatives from Hill AFB announced that low hydrogen embrittlement (LHE) ZnNi electroplate with a Cr³⁺ sealer was equal to or better than the currently used Cd plating with a Cr⁶⁺ sealer in all of their performance tests. Since it has met the qualification requirements as an alternative to Cd plating, Hill AFB intends to install a full-scale ZnNi plating line and move all production to the new process. In the area of paints and primers, advances have been made in low temperature and UV curable powder-coat and e-coating technologies that allow for expanded use on new materials and

new applications. These coatings are free of VOCs, and increasing their applications across DoD will result in environmental and cost benefits, while improving performance.

Progress on alternatives to hard chrome plating such as high velocity oxygen fueled (HVOF) coatings and electroplated nanophase Co-P coatings was also discussed. HVOF coatings continue to be used as an alternative to hard chrome plating on aircraft landing gear components. Nanophase Co-P coatings provide protection similar to hard chrome and can be applied using the same equipment, but they are significantly less harmful to workers and the environment. Two very different technologies have now demonstrated performance superior to hard chrome for gun barrels, an application where previous coatings had failed. One of these is an explosively clad Ta-W liner, and the other is an electromagnetically enhanced physical-vapor-deposited (PVD) coating.

Several new initiatives that are focused on developing tests to better qualify alternative coatings were presented. One such project is developing an accelerated dynamic corrosion test protocol intended to provide a reliable prediction of how a coating will perform in service, without the need for extensive atmospheric exposure and service testing. Another project is developing a standard method to evaluate hydrogen re-embrittlement in materials exposed to new alternative chemicals. A better test for hydrogen re-embrittlement would enable more alternative materials to be implemented into DoD maintenance processes since the current methods of evaluation are not accurate and rule out alternatives unnecessarily.

To facilitate implementation of new surface engineering technologies, NAVAIR has recently released a Non-Chromate Coatings Engineering Circular that defines how Cr⁶⁺ alternatives should be transitioned into Naval aircraft. ESTCP has funded a new project on non-chrome primers that adopts a similar approach. Led by Craig Matzdorf of NAVAIR, this project is intended to be an overarching effort to evaluate non-chrome primers currently on the market and develop test protocols for

qualifying new coatings. Its purpose is to bring alternatives into production as soon as possible for low risk applications, while developing the data and experience needed for more difficult situations.

For the full workshop report and briefings, visit www.asetdefense.org. A database of engineering data and reports, authorizations, and implementations related to alternative technologies is also available on the ASETSDefense web site at <http://db.asetdefense.org>. New information is continually being added to this database.



ASETSDefense—Advanced Surface Engineering Technologies for a Sustainable Defense—is a SERDP and ESTCP initiative that aims to facilitate the implementation of new, environmentally friendly technologies for surface engineering by providing ready access to information and data from RDT&E efforts supported by DoD organizations and the private sector. ♦

Congratulations to...

SERDP Principal Investigator **Dr. Kelly Benoit-Bird**, associate professor of biological oceanography at the College of Oceanic and Atmospheric Sciences at Oregon State University, who was awarded a fellowship with the MacArthur Fellows Program. This prestigious program awards unrestricted fellowships to individuals who have shown extraordinary originality and dedication in their creative pursuits and a marked capacity for self-direction. Dr. Benoit-Bird is a marine biologist who uses sophisticated acoustic engineering techniques to explore the previously invisible behavior of ocean creatures at scales ranging from swarms distributed over many cubic kilometers to individual predators. Her work addresses long-unanswered questions and provides a clearer picture of the structure and behavior of food chains, which in turn opens a new path for understanding the complexities of marine ecology.

Solutions-IES, Inc. for its selection by the American Council of Engineering Companies of North Carolina to receive the "Grand Award" for 2011. The ACEC/NC Engineering Excellence Award is an annual competition that honors and recognizes engineering and surveying firms for projects that demonstrate the highest degree of achievement, value, and ingenuity. Through work funded under ESTCP

project ER-200428, Solutions-IES made significant advancements in the field of perchlorate remediation. Their research and the development and publication of the protocol *Natural Attenuation of Perchlorate in Groundwater: Processes, Tools and Monitoring Techniques* has validated a sustainable approach to cleaning up an emerging contaminant. Using monitored natural attenuation (MNA) for perchlorate cleanup can reduce remediation costs by 50 to 65 percent for military and commercial installations worldwide, while protecting public health and safety.

SERDP Principal Investigator **Dr. Jun Xu** and his team at Oak Ridge National Laboratory (ORNL) for receiving a "Significant Event Award" for their SERDP project *Micro Ion Mobility Sensor (MIMS) for In Situ Monitoring of Contaminated Groundwater (ER-1603)*. Dr. Xu and his team—William Whitten, David Watson, and Wei Zhang—were presented this award for "exceeding expectations on their development of a novel sensor for in situ monitoring of groundwater contaminants." DoD's costs for long-term monitoring can be reduced through reliable and inexpensive methods such as this sensor.

ESTCP Principal Investigator **Dr. Steven Larson** and his team at the U.S. Army Engineer Research and Development Center (ERDC) Environmental Laboratory, who received a Federal Laboratory Consortium (FLC) Award for Excellence in Technology Transfer for their ESTCP project

Biopolymer Alternatives to Petroleum-Based Polymers for Soil Modification (ER-200920). Dr. Larson and his team—Andy Martin, Victor Medina, and Kent Newman—were presented this award for "accomplishing outstanding work in the process of transferring federally developed technology." Their project is demonstrating the efficacy of scaling up to pilot production *Rhizobium tropici* biopolymer, determining industrial-scale cost information for production, and performing a comparative performance evaluation of the biopolymer to a petroleum-based polymer.

EOS Remediation, which was honored with a U.S. Department of Commerce Export Achievement Certificate to recognize the firm's successful efforts in exporting groundwater remediation technologies to new overseas markets. This certificate is part of the Obama administration's efforts to highlight its goal of doubling U.S. exports within five years and was presented by Suresh Kumar, the Commerce Department's Assistant Secretary for Trade Promotion and Director General of the U.S. & Foreign Commercial Service. EOS Remediation is a leading provider of innovative patented methods for in situ aerobic and anaerobic bioremediation of soil and groundwater, many of which were developed with SERDP and ESTCP support.

Program Update

SERDP

SERDP released a Federal Call for Proposals and a Broad Agency Announcement (BAA) for its FY 2012 Core Solicitation on October 28, 2010. By the January 6, 2011, deadline for the BAA, the Program Office received 301 pre-proposals responding to 10 Statements of Need (SONs). SERDP Staff reviewed these pre-proposals and, by early February, extended requests for full proposals to investigators who submitted the most qualified pre-proposals. Full proposals responding to the Federal Call for Proposals and full proposals that were requested to respond to the BAA were due March 10, 2011.

On October 28, SERDP also released its FY 2012 SERDP Exploratory Development (SEED) Solicitation with one SON in Munitions Response. Full proposals were due by March 10, 2011. The SEED program is designed to investigate innovative approaches that entail high technical risk or require supporting data to provide proof of concept. SEED proposals are limited to not more than \$150,000 and approximately one year in duration.

The FY 2012 SERDP Statements of Need are listed below. Visit www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations for additional information.

ESTCP

The ESTCP FY 2012 Environmental Technologies Solicitation was released on January 13, 2011. The BAA and non-DoD Federal Call for Proposals solicited pre-proposals in six topic areas (see box). The DoD Call for Proposals solicited pre-proposals in Environmental Restoration, Munitions Response,

Resource Conservation, and Weapons Systems and Platforms. Pre-proposals were due by March 8, 2011.

The ESTCP FY 2012 Installation Energy Solicitation was released on February 1, 2011. The BAA, non-DoD Federal Call for Proposals, and DoD Call for Proposals solicited pre-proposals in five topic areas (see box). **Pre-proposals are due March 24, 2011.**

For details regarding these open solicitations, visit www.serdp-estcp.org/Funding-Opportunities/ESTCP-Solicitations. ♦

FY 2012 ESTCP Environmental Technologies BAA and Non-DoD Federal Topics

- Management of Contaminated Groundwater
- In Situ Management of Contaminated Sediments
- Military Munitions Detection, Discrimination, and Remediation
- Recovery of Threatened and Endangered and Sustainment of At-Risk Plant Species
- Inventory and Monitoring Technologies for Vertebrate Populations
- Environmentally Sustainable Energetic Materials and Manufacturing Processes

FY 2012 ESTCP Installation Energy BAA, Non-DoD Federal, and DoD Topics

- Smart Micro-grids and Energy Storage to Increase Energy Security on DoD Installations
- Renewable Energy Generation on DoD Installations
- Advanced Component Technologies to Improve Building Energy Efficiency
- Advanced Building Energy Management and Control
- Tools and Processes for Design, Assessment and Decision-Making Associated with Energy Use and Management

FY 2012 SERDP Statements of Need

Environmental Restoration

- Development of Sustainable Wastewater Treatment Processes for Forward Operating Bases
- Environmental Fate and Impacts of Insensitive Munitions Compounds

Munitions Response

- Advanced Technologies for Detection, Discrimination, and Remediation of Military Munitions on Land
- Improvements in the Detection and Remediation of Military Munitions Underwater
- Advanced Technologies for Detection, Discrimination, and Remediation of Military Munitions on Land and Underwater (SEED)

Resource Conservation and Climate Change

- Assessment and Monitoring of Biological Diversity: Method Development
- Climate Change Impacts to Department of Defense Installations

Weapons Systems and Platforms

- Chemical Agent Resistant Powder Topcoats
- Scale-Up and Formulation of Green Insensitive Secondary Explosives
- Waste to Energy Converters for Overseas Contingency Operations
- Reliability of Tin-Whisker-Mitigating Conformal Coatings

SERDP and ESTCP Announce FY 2011 New Start Project Selections

More than 100 SERDP and ESTCP new start projects have been selected for funding in FY 2011. These projects responded to the following FY 2011 solicitations: SERDP Core and SERDP Exploratory Development (SEED); ESTCP DoD Call for Proposals, Non-DoD Federal Call for Proposals, and Broad Agency Announcement (BAA); and ESTCP Special Munitions Response BAA. Topics being addressed by these projects include energy conservation and efficiency, climate change impacts, marine mammal ecology, ecological forestry, ecosystem services, contaminated groundwater, contaminated sediments, risk assessment, munitions response, green manufacturing and maintenance, noise monitoring, and alternative fuel emissions.

The FY 2011 new start projects for SERDP ([Environmental Restoration](#), [Munitions Response](#), [Resource Conservation and Climate Change](#), and [Weapons Systems and Platforms](#)) and ESTCP ([Energy and Water](#), [Environmental Restoration](#), [Munitions Response](#), [Resource Conservation and Climate Change](#), and [Weapons Systems and Platforms](#)) are listed here. Information on these and other SERDP and ESTCP projects is available at www.serdp-estcp.org under Program Areas or by entering the project number in the *Search* box.

SERDP ENVIRONMENTAL RESTORATION

PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
ERSON-11-01: Determination of the Environmental Impacts of Munitions Compounds in the Marine Environment			
ER-2122	Tracking the Uptake, Translocation, Cycling, and Metabolism of Munitions Compounds in Coastal Marine Ecosystems Using Stable Isotopic Tracer	Dr. Craig Tobias	University of Connecticut, Department of Marine Sciences
ER-2123	Photochemical Transformation of Munitions Constituents in Marine Waters	Dr. Dianne Luning Prak	U.S. Naval Academy
ER-2124	TNT Incorporation and Mineralization by Natural Microbial Assemblages at Frontal Boundaries between Water Masses and in Underlying Sediments in Coastal Ecosystems	Dr. Michael Montgomery	Naval Research Laboratory
ERSON-11-02: In Situ Remediation of Perfluoroalkyl Contaminated Groundwater			
ER-2126	Behavior of Perfluoroalkyl Chemicals in Contaminated Groundwater	Dr. Christopher Higgins	Colorado School of Mines, ESE Division
ER-2127	Remediation of Perfluoroalkyl Contaminated Aquifer Using an In Situ Two-Layer Barrier: Laboratory Batch and Column Study	Dr. Qingguo Huang	University of Georgia, Department of Crop and Soil Sciences
ER-2128	Characterization of the Fate and Biotransformation of Fluorochemicals in AFFF-Contaminated Groundwater at Fire/Crash Testing Military Sites	Dr. Jennifer Field	Oregon State University, Environmental & Molecular Toxicology

Continued next page

SERDP ENVIRONMENTAL RESTORATION (continued)

PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
ERSON-11-03: Improved Understanding of Impacts to Groundwater Quality Post-Remediation			
ER-2129	Secondary Impacts of In Situ Remediation on Groundwater Quality and Post-Treatment Management Strategies	Dr. Kurt Pennell	Tufts University, Department of Civil and Environmental Engineering
ER-2130	Assessing the Potential Consequences of Subsurface Bioremediation: Fe-Oxide Bioreductive Processes and the Propensity for Contaminant-Colloid Co-Transport and Media Structural Breakdown	Dr. Philip Jardine	University of Tennessee, Biosystems Engineering and Soil Science Department
ER-2131	Numerical Modeling of Post-Remediation Impacts of Anaerobic Bioremediation on Groundwater Quality	Dr. Robert Borden	North Carolina State University, Department of Construction and Environmental Engineering
ER-2132	Impacts on Groundwater Quality Following the Application of ISCO: Understanding the Cause of and Designing Mitigation for Metals Mobilization	Dr. Kevin Gardner	University of New Hampshire, Civil Engineering

ERSEED-11-01: In Situ Remediation of Contaminated Aquatic Sediments

ER-2134	A Permeable Active Amendment Concrete (PAAC) for Contaminant Remediation and Erosion Control	Dr. Anna Knox	Savannah River National Laboratory
ER-2135	Application of Biofilm-Covered Activated Carbon Particles as a Microbial Inoculum Delivery System for Enhanced Bioaugmentation of PCBs in Contaminated Sediment	Dr. Birthe Kjellerup	Goucher College, Biological Sciences
ER-2136	Activated Biochars with Iron for In Situ Sequestration of Organics, Metals, and Carbon	Dr. Upal Ghosh	University of Maryland Baltimore County, Department of Civil and Environmental Engineering

SERDP MUNITIONS RESPONSE

PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
MMSON-11-01: Advanced Technologies for Detection, Discrimination, and Remediation of Military Munitions on Land			
MR-2100	Tensor Invariant Processing for Munitions/Clutter Classification	Dr. Thomas Bell	SAIC
MR-2101	Location, Identification, and Enumeration of UXO in Complex Environments Using Time-Reversal Methods in Electromagnetics	Dr. James Berryman	Lawrence Berkeley National Laboratory

MMSON-11-02: Improvements in the Detection and Remediation of Military Munitions Underwater

MR-2102	Proof of Concept Study for Immobilization of Submerged Munitions Using Geobags	Mr. Barry Bunch	U.S. Army Engineer Research and Development Center, Environmental Laboratory
MR-2103	Structural Acoustic UXO Detection and Identification in Marine Environments	Dr. Brian Houston	Naval Research Laboratory
MR-2104	Real-Time Handheld Magnetometer Array	Dr. Mark Prouty	Geometrics, Inc.

SERDP MUNITIONS RESPONSE (continued)			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
MMSEED-11-01: Advanced Technologies for Detection, Discrimination, and Remediation of Military Munitions on Land and Underwater			
MR-2105	Compact Low-Cost Ultra-Wideband EMI Sensors for Enhanced UXO Characterization	Dr. Charles Oden	Earth Science Systems, LLC
MR-2106	Kalman Filters for UXO Detection: Real-Time Feedback and Small Target Detection	Dr. Tomasz Grzegorzcyk	Delpsi LLC
MR-2107	Investigation of an EMI-Based Marine Classification System	Dr. Dean Keiswetter	SAIC
MR-2108	Underwater Electric Field Sensor for UXO Detection	Dr. Yongming Zhang	QUASAR Federal Systems, Inc.
SERDP RESOURCE CONSERVATION AND CLIMATE CHANGE			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
SISON-11-01: Impacts of Climate Change on Alaskan Ecological Systems			
RC-2109	Identifying Indicators of State Change and Forecasting Future Vulnerability in Alaskan Boreal Ecosystems	Dr. Edward Schuur	University of Florida, Department of Biology
RC-2110	Addressing the Impacts of Climate Change on U.S. Army Alaska with Decision Support Tools Developed through Field Work and Modeling	Dr. Thomas Douglas	U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory
RC-2111	Improved Understanding of Permafrost Controls on Hydrology in Interior Alaska by Integration of Ground-Based Geophysical Permafrost Characterization and Numerical Modeling	Dr. Michelle Walvoord	U.S. Geological Survey
SISON-11-02: Behavioral Ecology of Cetaceans			
RC-2112	Deep Mapping Teuthivorous Whales and Their Prey Fields	Dr. Kelly Benoit-Bird	Oregon State University, College of Oceanic and Atmospheric Sciences
RC-2113	Behavioural Ecology of the Ziphiid Northern Bottlenose Whale: The Relationship of Body Condition with Behaviour and Reproductive Success	Dr. Patrick Miller	University of Saint Andrews, School of Biology
RC-2114	Behavioral Ecology of Deep-Diving Odontocetes in the Bahamas	Ms. Diane Claridge	Bahamas Marine Mammal Research Organisation

Continued next page

SERDP RESOURCE CONSERVATION AND CLIMATE CHANGE (continued)			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
SISON-11-03: Ecological Forestry and Carbon Management			
RC-2115	Developing Tools for Ecological Forestry and Carbon Management	Dr. Lisa Samuelson	Auburn University, School of Forestry & Wildlife Sciences
RC-2116	Statistically Rigorous Carbon Stock Predictions of Forest Restoration in the South Central United States	Dr. Duncan Wilson	Oklahoma State University, Natural Resource Ecology & Management
RC-2117	Developing Novel Ecosystems that Enhance Carbon Storage, Native Biodiversity, and Human Mobility in Lowland Hawaiian Forests	Dr. Rebecca Ostertag	University of Hawaii at Hilo, Department of Biology
RC-2118	Modeling the Carbon Implications of Ecologically Based Forest Management	Dr. Matthew Hurteau	Northern Arizona University, School of Earth Sciences & Environmental Sustainability
SISON-11-04: Ecology and Management of Source-Sink Populations			
RC-2119	Endangered Butterflies as a Model System for Managing Source-Sink Dynamics on Department of Defense Lands	Dr. Elizabeth Crone	President and Fellows of Harvard University
RC-2120	Sources and Sinks: Elucidating Mechanisms, Documenting Patterns, and Forecasting Impacts	Dr. Joshua Lawler	University of Washington, College of Forest Resources
RC-2121	Using a Hierarchical Approach to Model Regional Source-Sink Dynamics for Neotropical-Nearctic Songbirds to Inform Management Practices on Department of Defense Installations	Dr. Peter Marra	Smithsonian Migratory Bird Center
SERDP WEAPONS SYSTEMS AND PLATFORMS			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
WPSON-11-01: Development of Alternatives to Copper-Beryllium and Aluminum-Beryllium Alloys for Military Applications			
WP-2137	Nanostructured Copper Alloys as an Alternative to Copper-Beryllium	Dr. Jonathan McCrea	Integran Technologies Inc.
WP-2138	Alternative Copper-Beryllium Alloys Development	Dr. Eric Fodran	Northrop Grumman Corporation
WP-2139	Demonstration of Ultrahigh-Strength Nanocrystalline Copper Alloys for Military Applications	Dr. Kristopher Darling	U.S. Army Research Laboratory

Continued next page

SERDP WEAPONS SYSTEMS AND PLATFORMS (continued)			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
WPSON-11-02: Environmentally Benign, Insensitive, Castable, High-Performance, Minimum-Smoke Rocket Propellant			
WP-2140	Evaluation of Metal Bound Porphyrins and Porphyrins as Lead Salt Replacements as Ballistic Modifiers in Minimum Signature XLDB Propellants	Dr. Ronald Clawson	ATK Tactical Propulsion and Controls
WP-2141	Novel Energetic Polyphosphazene Polymer Binder System for Environmentally Benign Rocket Propellants	Mr. Joseph Clubb	Naval Air Warfare Center Weapons Division
WP-2142	Novel Lead-Free Ballistic Modifiers for Improved, IM-Compliant Minimum Signature Propellants	Dr. Andrew Nelson	Naval Air Warfare Center Weapons Division
WP-2143	Eliminating Lead, RDX, and AP in a Castable, EMMS-Configured Propellant while Maintaining Performance	Dr. Bradley Sleadd	Naval Surface Warfare Center, Indian Head Division
WPSON-11-03: Understanding the Corrosion Protection Requirements for Adhesive Bond Primers			
WP-2144	Understanding Corrosion Protection Requirements for Adhesive Bond Primers	Ms. Diane Kleinschmidt	Naval Air Warfare Center Aircraft Division
WPSON-11-04: Combustion Science to Predict Emissions from Military Platforms Burning Alternative Fuels			
WP-2145	The Science of Emissions from Alternative Fuels	Dr. William Roquemore	Air Force Research Laboratory
WP-2151	Development of Demonstrably Predictive Models for Emissions from Alternative Fuels-Based Aircraft Engines	Dr. Venkatramanan Raman	The University of Texas at Austin, Aerospace Engineering and Engineering Mechanics
WPSON-11-05: Environmentally Benign Removal Process for Low Observable Weapons Systems			
WP-2146	High Speed, Substrate Safe Low Observable Coating Laser Stripping	Mr. Alan Fletcher	Air Force Research Laboratory
WPSEED-11-01: Replacement of Hexachloroethane in Handheld Obscurants			
WP-2148	Development of Low-Toxicity Obscurant Material	Mr. Rutger Webb	TNO Defence, Security and Safety
WP-2149	Replacement of HC in Handheld Obscurants	Mr. Nathan Seidner	ATK Space Systems
WP-2150	Surface Modified TiO ₂ Obscurants for Increased Safety and Performance	Dr. Steven Oldenburg	nanoComposix, Inc.

ESTCP ENERGY AND WATER			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
EW-201133	Architectural Daylighting System	Dr. J. Thomas Simpson	3M Company
EW-201134	Grid-Parity Solar Power for Department of Defense Installations	Dr. Brian Sager	Nanosolar, Inc.
EW-201135	Coupling Geothermal Heat Pumps with Underground Seasonal Thermal Energy Storage	Mr. Charles Hammock, Jr.	Andrews, Hammock & Powell, Inc.
EW-201136	Air Source Cold Climate Heat Pump	Mr. William Hutzel	Purdue University, Department of Mechanical Engineering Technology
EW-201137	LDDX: A High-Efficiency Air Conditioner for DoD Buildings	Dr. Andrew Lowenstein	AIL Research, Inc.
EW-201138	Innovative Phase Change Approach for Significant Energy Savings	Dr. Aly Shaaban	Applied Research Associates, Inc.
EW-201139	High-Performance Energy-Efficient Cool Metal Roof Assemblies Utilizing Building Integrated Renewable Solar Energy Technologies for New and Retrofit Building Construction	Mr. Robert Scichili	Metal Construction Association
EW-201140	Microgrid Enabled Distributed Energy Solutions for DoD Installations	Mr. Jason Heims	Lockheed Martin Corporation
EW-201141	Dynamic Exterior Lighting for Energy and Cost Savings in DoD Installations	Dr. Satyen Mukherjee	Philips Research North America
EW-201142	Energy Performance Monitoring and Optimization System for DoD Campuses	Mr. Trevor Bailey	United Technologies Research Center
EW-201143	Demonstration of High Gain Solar Technology for Renewable, Distributed Energy Generation	Dr. Marc Finot	Skyline Solar
EW-201144	Demonstration and Testing of ClimaStat® for Improved DX Air-Conditioning Efficiency	Dr. Michael West	Advantek Consulting, Inc.
EW-201145	Solar CHP—Combined Heat and Power Using the Infinia Concentrated Solar Power System	Mr. Jason Modrell	Infinia Corporation
EW-201146	Concentrating Photo-Voltaic System for DoD Rooftop Installations	Mr. Ian Wood	Electricore, Inc.
EW-201147	Advanced Microgrid Energy Management Coupled with Integrated Volt/VAR Control for Improved Energy Efficiency, Energy Security, and Power Quality at DoD Installations	Dr. Michael Krok	GE Global Research Center
EW-201148	Solar Air Heating Metal Roofing for Re-Roofing, New Construction, and Retrofit	Mr. John Archibald	American Solar, Inc.
EW-201149	Energy Efficient Phase Change Materials Insulation	Dr. Larry Stephenson	U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory

Continued next page

ESTCP ENERGY AND WATER (continued)			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
EW-201150	Systems Approach to Improved Facility Energy Performance	Mr. James Miller	U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory
EW-201151	Exhaust Hood and Makeup Air Optimization	Mr. David Underwood	U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory
EW-201152	Converting Constant Volume, Multizone Air Handling Systems to Energy Efficient Variable Air Volume Multizone Systems	Mr. David Schwenk	U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory
EW-201153	Full-Scale Evaluation of an Energy Foundation for Buildings	Dr. Karen Henry	U.S. Air Force Academy
EW-201154	Field Validation of Microencapsulated Phase Change Material Slurry as Heat Transfer Fluid	Mr. Sean Morefield	U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory
EW-201155	Integrated Water Planning through Building Level Cascade of Water Use	Ms. Elisabeth Jenicek	U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory

ESTCP ENVIRONMENTAL RESTORATION

PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
ER-201118	Demonstration of a Fractured Rock Geophysical Toolbox for Characterization and Monitoring of DNAPL Biodegradation in Fractured Rock Aquifers	Dr. Lee Slater	Rutgers University, Department of Earth & Environmental Sciences
ER-201119	Use of On-Site GC/MS Analysis to Distinguish between Vapor Intrusion and Indoor Sources of VOCs	Dr. Thomas McHugh	GSI Environmental Inc.
ER-201120	Development of an Expanded, High-Reliability Cost and Performance Database for In Situ Remediation Technologies	Mr. Travis McGuire	GSI Environmental Inc.
ER-201121	Direct Push Optical Screening Tool for High Resolution, Real-Time Mapping of Chlorinated Solvent DNAPL Architecture	Mr. Murray Einarson	AMEC Geomatrix, Inc.
ER-201122	Cost-Effective, Ultra-Sensitive Groundwater Monitoring for Site Remediation and Management	Dr. Rolf Halden	The Biodesign Institute at Arizona State University

ESTCP ENVIRONMENTAL RESTORATION (continued)			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
ER-201123	Generation of Biodegradation-Sorption Barriers for Munitions Constituents	Dr. Robert Borden	North Carolina State University, Department of Construction and Environmental Engineering
ER-201124	In Situ Biogeochemical Transformation of Chlorinated Solvents	Dr. Patrick Evans	CDM Federal Programs Corp.
ER-201125	Use of Mass-Flux Measurement and Vapor-Phase Tomography to Quantify Vadose-Zone Source Strength and Distribution	Dr. Mark Brusseau	University of Arizona, Department of Soil, Water and Environmental Science
ER-201126	Decision Support System for Matrix Diffusion Modeling	Dr. Charles Newell	GSI Environmental Inc.
ER-201127	Quantifying Life-Cycle Environmental Footprints of Soil and Groundwater Remedies	Ms. Karla Harre	Naval Facilities Engineering Command - Engineering Service Center
ER-201128	Microelectrode Observatory for In Situ Monitoring of Metals Concentration and Mobility in Contaminated Sediments	Dr. Nancy Ruiz	Naval Facilities Engineering Command - Engineering Service Center
ER-201129	Development and Validation of a Quantitative Framework and Management Expectation Tool for the Selection of Bioremediation Approaches at Chlorinated Solvent Sites	Ms. Carmen Lebrón	Naval Facilities Engineering Command - Engineering Service Center
ER-201130	Demonstration and Commercialization of the Sediment Ecosystem Assessment Protocol (SEAP)	Mr. Gunther Rosen	SPAWAR Systems Center Pacific
ER-201131	Demonstration of In Situ Treatment with Reactive Amendments for Contaminated Sediments in Active DoD Harbors	Dr. Bart Chadwick	SPAWAR Systems Center Pacific

Continued next page

ESTCP MUNITIONS RESPONSE			
PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
MR-201101	Advanced EMI Models for Live-Site UXO Discrimination	Dr. Fridon Shubitidze	Sky Research, Inc.
MR-201102	Semi-Automated Ferrous Material Scouring System	Mr. Christopher Fromme	National Robotics Engineering Center, Carnegie Mellon
MR-201103	Munitions Detection Using Unmanned Underwater Vehicles Equipped with Advanced Sensors	Mr. Robert Leasko	Naval Surface Warfare Center Panama City Division
MR-201104	Evaluation of Discrimination Technologies and Classification Results	Mr. Greg Van	Parsons
MR-201105	High-Power Vehicle-Towed TEM for Small Ordnance Detection	Mr. Thomas Jeffrey Gamey	Battelle Memorial Institute
MR-201156	Demonstration and Validation of Statistical Analysis Techniques for TOI Discrimination Using Advanced EMI Sensor Systems	Mr. Levi Kennedy	Signal Innovations Group
MR-201157	Demonstration of MetalMapper Static Data Acquisition and Data Analysis at Pole Mountain Target and Maneuver Area	Mr. Greg Van	Parsons
MR-201158	Man-Portable Vector EMI Sensor for UXO Contamination Assessment at Munitions Sites	Dr. Nicolas Lhomme	Sky Research, Inc.
MR-201159	Dipole Models for UXO Discrimination at Live Sites	Dr. Leonard Pasion	Sky Research, Inc.
MR-201160	Data Collection with Vehicular-Based Systems	Dr. Stephen Billings	Sky Research, Inc.
MR-201161	Demonstration of Advanced Geophysics and Classification Technologies on Munitions Response Sites	Ms. Victoria Kantsios	URS Corporation
MR-201162	Continued MetalMapper Demonstrations	Dr. Mark Prouty	Geometrics
MR-201163	Demonstration of Advanced Electromagnetic Induction Classification Technologies—Man-Portable Time-Domain Electromagnetic and MetalMapper	Mr. Tamir Klaff	CH2M Hill
MR-201164	Demonstration of Physics-Inspired Classification Methodologies for Munitions Response	Dr. Dean Keiswetter	SAIC
MR-201165	Advanced EMI Data Collection Systems' Demonstration	Dr. Barry Spargo	Naval Research Laboratory

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ESTCP RESOURCE CONSERVATION AND CLIMATE CHANGE

PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
RC-201112	Demonstration and Implementation of Autonomous Aerial Acoustic Recording Systems to Inventory DoD Installation Impact Areas for Threatened, Endangered, and Species at Risk Bird Populations	Dr. Richard Fischer	U.S. Army Engineer Research and Development Center, Environmental Laboratory
RC-201113	Enlisting Ecosystem Services: Quantification and Valuation of Ecosystem Services to Inform Base Management	Dr. Gretchen Daily	Stanford University, Department of Biological Sciences
RC-201114	Regulating Services as Measures of Ecological Resilience on DoD Lands	Dr. Paul Angermeier	U.S. Geological Survey, Virginia Cooperative Fish and Wildlife Research Unit, Virginia Tech
RC-201115	Implementation of a Multi-Objective Decision Support Tool for Ecosystem Services at Department of Defense Installations	Mr. Pieter Booth	Exponent
RC-201116	Development of an Installation Sustainability Measurement Tool: Sustainable Communities	Mr. Christopher Kruzel	Air Force Center for Engineering and the Environment

ESTCP WEAPONS SYSTEMS AND PLATFORMS

PROJECT NUMBER	PROJECT TITLE	LEAD PI	ORGANIZATION
WP-201106	Beryllium Replacement Using Coated Powder Metal Matrix Materials	Ms. Amanda Gentry	F-35 Lightning II Program Office
WP-201107	Demonstrate/Validate Zinc-Nickel as Replacement for Cadmium/Cyanide Plating Process for Air Force Landing Gears	Mr. David Frederick	Ogden Air Logistics Center
WP-201108	Environmentally Benign Repair of Composites Using High Temperature Cyanate Ester Nanocomposites	Ms. Kristine Obusek	Naval Air Systems Command
WP-201109	Demonstration of DBX-1 as an Alternative to RD-1333 Lead Azide	Mr. Travis Thom	Naval Surface Warfare Center, Indian Head Division
WP-201110	Elimination of Perchlorate Oxidizers from Incendiary Projectile Compositions	Mr. Gary Chen	U.S. Army Armament Research, Development and Engineering Center
WP-201111	Chromium Elimination and Cannon Life Extension	Mr. Frank Campo	U.S. Army Armament Research, Development and Engineering Center
WP-201117	Improved Military Noise Monitoring System	Mr. Edward Nykaza	U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory
WP-201132	Comprehensive Evaluation and Transition of Non-Chromated Paint Primers	Mr. Craig Matzdorf	Naval Air Systems Command

New SERDP and ESTCP Resources

The following are samples of new publications now available on the SERDP and ESTCP web site (www.serdp-estcp.org). Access them from the *Search* box by entering the project number noted after the report title (e.g., 200125). Other documents may be accessed by entering an appropriate keyword.

Environmental Restoration

- Cost & Performance Report: Remediation of DNAPL through Sequential In Situ Chemical Oxidation and Bioaugmentation (ESTCP ER-200116)
- Cost & Performance Report: Loading Rates and Impacts of Substrate Delivery for Enhanced Anaerobic Bioremediation (ESTCP ER-200627)
- Guidance Document: Design Tool for Planning Permanganate Injection Systems (ESTCP ER-200626)
- Final Report: Evaluation of Potential for Monitored Natural Attenuation of Perchlorate in Groundwater (Indian Head) (ESTCP ER-200428)
- Final Report: Development of Toxicity Data for Munitions Compounds to Support Toxicity Reference Value Derivations for Wildlife (SERDP ER-1420)

Munitions Response

- Cost & Performance Report: EMI Array for Cued UXO Discrimination (ESTCP MR-200601)
- Cost & Performance Report: Improved Processing, Analysis, and Use of Historical Photography (ESTCP MR-200812)
- Demonstration Data Report: SIG Data Analysis for ESTCP Classification Study at the Former Camp San Luis Obispo, California (ESTCP MR-200501)

Resource Conservation and Climate Change

- Final Report: Application of Landscape Mosaic Technology to Complement Coral Reef Resource Mapping and Monitoring (SERDP RC-1333)

Weapons Systems and Platforms

- Cost & Performance Report: Demonstration of Low Emissions Trapped Vortex Combustor Technology—Limited Distribution (ESTCP WP-200123)
- Final Report: Replacement of Cadmium Plated Steels with S-53 Stainless Steel in Rotary Geared Actuators—Limited Distribution (ESTCP WP-200619)



On-Demand Video: National Security Implications of Climate Change

At the United Nations Climate Change Conference (COP-16) held November 29 – December 10, 2010, in Cancun, Mexico, a four-person panel presented an overview of how climate change will impact the Department of Defense and how DoD can contribute to the development of climate change solutions. Panel members included Deputy Assistant Secretary of Defense for Strategy Amanda Dory, Rear Admiral David Tittle (U.S. Navy), SERDP and ESTCP Director Dr. Jeffrey Marqusee, and Brigadier General Juan Ayala (U.S. Marine Corps).

An on-demand video (1:27:43) of this presentation is available at <http://www.connectsolutions.com/cop16/ondemand/od12-9-04-2010.html>.



STRATEGIC ENVIRONMENTAL RESEARCH
AND DEVELOPMENT PROGRAM (SERDP)
ENVIRONMENTAL SECURITY TECHNOLOGY
CERTIFICATION PROGRAM (ESTCP)

INFORMATION BULLETIN

WINTER 2011

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C ◆ A ◆ L ◆ E ◆ N ◆ D ◆ A ◆ R

F O R S E R D P A N D E S T C P

MARCH 2011

March 8

Pre-proposals due in response to the ESTCP
FY 2012 Environmental Technologies Solicitation
Federal Call for Proposals and Broad Agency
Announcement

March 10

Full proposals due in response to the SERDP
FY 2012 Core Solicitation Federal Call for Proposals
and Broad Agency Announcement

Full proposals due in response to the FY 2012
SERDP Exploratory Development (SEED) Solicitation

March 24

Pre-proposals due in response to the ESTCP
FY 2012 Installation Energy Solicitation Federal Call
for Proposals and Broad Agency Announcement

APRIL 2011

April 11-15

Weapons Systems and Platforms (WP) In-Progress
Review (IPR) meeting

MAY 2011

May 3-6

Resource Conservation and Climate Change (RC)
IPR meeting

May 10-12

Munitions Response (MR) IPR meeting

May 23-27

Environmental Restoration (ER) IPR meeting

JUNE 2011

June 15-16

SERDP Scientific Advisory Board (SAB) meeting
Location to be announced

CONFERENCES & EVENTS

March 14-19

2011 National Military Fish & Wildlife Association
(NMFWA) Meeting
Kansas City, Missouri

For more information, visit
www.nmfwa.org/2011_Meeting.

March 28-April 1

2011 Environmental Monitoring and Data Quality
Workshop
Arlington, Virginia

For more information, visit
[www.regonline.com/builder/site/default.aspx?
EventID=901318](http://www.regonline.com/builder/site/default.aspx?EventID=901318).

April 10-14

Symposium on the Application of Geophysics to
Environmental and Engineering Problems
(SAGEEP) 2011
Charleston, South Carolina

For more information, visit www.eegs.org/sageep.

May 9-12

Environment, Energy Security & Sustainability
Symposium and Exhibition
New Orleans, Louisiana

For more information, visit <http://e2s2.ndia.org>.

May 16-19

RemTEC Summit 2011
Chicago, Illinois

For more information, visit www.remtecsummit.com.

May 16-20

EPA's 21st Annual National Association of Remedial
Project Managers (NARPM) Training Program
Kansas City, Missouri

For more information, visit www.epanarpm.org.

June 27-30, 2011

Bioremediation and Sustainable Environmental
Technologies Symposium
Reno, Nevada

For more information, visit www.battelle.org/biosymp.

July 25-29

2011 Sustaining Military Readiness Conference
Nashville, Tennessee

For more information, visit www.smrconference.com.

July 31-August 5

DoD Corrosion Conference 2011
La Quinta, California

For more information, visit [http://events.nace.org/
conferences/dod2011/index.asp](http://events.nace.org/conferences/dod2011/index.asp).

August 7-10

GovEnergy 2011: A River of Energy Solutions!
Cincinnati, Ohio

For more information, visit www.govenergy.com.

August 7-12

96th Ecological Society of America (ESA)
Annual Meeting
Austin, Texas

For more information, visit www.esa.org/austin.

September 18-23

Society of Exploration Geophysicists (SEG)
International Exposition and 81st Annual Meeting
San Antonio, Texas

For more information, visit [www.seg.org/events/
annual-meeting/am2011overview](http://www.seg.org/events/annual-meeting/am2011overview).

October 4-7

GreenBuild 2011
Toronto, Ontario

For more information, visit www.greenbuildexpo.org.

November 13-17

SETAC North America 32nd Annual Meeting
Boston, Massachusetts

For more information, visit <http://boston.setac.org>.

November 29-December 1

Partners in Environmental Technology Technical
Symposium & Workshop
Washington, D.C.

For more information, visit [www.serdp-
estcp.org/symposium](http://www.serdp-estcp.org/symposium).

December 5-9

AGU Fall Meeting 2011
San Francisco, California

For more information, visit www.agu.org/meetings.