



SPRING 2007
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PARTNERS IN
ENVIRONMENTAL TECHNOLOGY
TECHNICAL
SYMPOSIUM & WORKSHOP

CALL FOR POSTER ABSTRACTS

Guidelines for poster abstract
submissions will be posted
no later than June 1 at
www.serdp.org and
www.estcp.org. Space will be
available to display poster
presentations of technologies
that relate to SERDP and ESTCP
areas of interest. Both federal
and non-federal submissions
will be considered.

Abstracts will be due
July 31, 2007.



SERDP
Strategic Environmental Research
and Development Program



INFORMATION B • U • L • L • E • T • I • N

Research, New Technologies Urged to Tackle Environment and Energy Issues

Based on current projections, China will be consuming oil at the same per-person rate as the United States by the year 2031. At that rate, China would use 99 million barrels of oil every day according to renowned environmental analyst and author Mr. Lester Brown. The problem? The world currently is producing only 84 million barrels of oil per day and may never produce more.

And if China one day should have three cars for every four people, as the United States now does, its fleet would total 1.1 billion vehicles—well beyond the current world fleet of 800 million. Providing roads, highways, and parking lots for this many cars would require paving an area roughly equal to China's land in rice, its principal food staple.

These are just two of many examples why current levels of energy and resource consumption cannot possibly be sustained in the coming years, according to Mr. Brown, one of three speakers at the opening session of the 2006 Partners in Environmental Technology Technical Symposium & Workshop. The Symposium & Workshop, hosted annually by SERDP and ESTCP, took place at the Marriott Wardman Park Hotel in Washington, D.C., November 28-30, 2006. More than 1,000 environmental professionals attended, the largest turnout in the event's 11-year history.

Attendees listened intently as Mr. Brown laid out his sobering assessment and urged them to work to develop and demonstrate technological advances aimed at conserving resources, maximizing renewable energy sources, and stabilizing the world's climate.

"The fact is the western economic model—the fossil fuel-based, automobile-centered, throwaway economy—will not work for China's 1.45 billion people in 2031," said Mr. Brown, who founded the Earth Policy Institute. That model also will not work for India or for the other 3 billion people in developing countries who also are striving for the 'American dream,' he explained.

"And in an increasingly integrated world economy, where countries everywhere are

competing for the same resources, the existing economic model will not work for the United States and other industrial countries either," Mr. Brown said.

Scientists must harness and improve on existing tools, such as wind power and hybrid vehicles, while also studying and developing new renewable energy sources and other environmentally friendly technologies.

"We are a civilization in trouble and we are going to

have to make major course corrections," said Mr. Brown. "These are complex issues, but if we act together, I see enormous possibility."

Reducing energy consumption and identifying and using alternative energies are high priorities for the Department of Defense (DoD) both to protect and improve the environment and to save money, Mr. Alex Beehler, Assistant Deputy Under Secretary of Defense (Environment, Safety and Occupational Health), told attendees during the Plenary Session.

DoD is the single largest user of jet fuel in the United States, which means that even modest increases in fuel prices can cost the military billions of dollars. Beyond controlling costs, using alternative fuels and conserving energy improves



"SERDP and ESTCP are uniquely positioned to help bring about a successful marriage of the environment and energy," Mr. Alex Beehler informed Symposium attendees.

DoD Identifies TER-S Priorities Through Regional Workshops that Seek Input from Diverse Stakeholders

The Department of Defense (DoD) is responsible for management of nearly 30 million acres of land as well as waters and airspace used for testing and training military service personnel and their equipment. These areas harbor approximately 320 different threatened and endangered species and nearly 550 species at risk, more per acre than any other federal lands. To successfully manage these threatened, endangered, and at-risk species (TER-S) and their habitats, it is critical that DoD lands be viewed as part of a broader conservation landscape. It is with this goal in mind that SERDP, ESTCP, and the Legacy Resource Management Program (Legacy) partnered to sponsor a national symposium and a series of regional workshops aimed at identifying the highest priority research, demonstration, and management needs for TER-S on DoD and adjacent lands. Through targeted investments and expanded partnerships, TER-S conservation can be strengthened and military mission readiness sustained.

National Symposium

To begin exploring issues related to TER-S on DoD and adjacent lands, SERDP, ESTCP, Legacy, and the U.S. Army Corps of Engineers Engineer Research and Development Center (ERDC) hosted a national symposium June 7-9, 2005, in Baltimore, Maryland. The key objectives of this symposium were to present the most up-to-date information on government and academic TER-S research relevant to DoD; increase collaboration, information exchange, and technology transfer among stakeholders and participants; and identify additional areas of research needed to address TER-S and associated habitat issues facing DoD and other federal land management agencies. Participants included researchers and managers from nearly 200 government and state agencies, non-governmental organizations (NGO), universities, and private consulting firms.

Recommendations from the symposium included the need to (1) enhance basic life history research on individual TER-S; (2) increase proactive conservation and management efforts as appropriate for both species at risk and invasive species; (3) develop peer-reviewed data standards and monitoring protocols; (4) improve predictive models to support management decisions; (5) focus conservation efforts on ecosystems rather than individual species; and (6) improve information sharing among stakeholders. Many of the organizations represented at the event are now actively working, both collaboratively and independently, to address these recommendations.

The complete proceedings from this Symposium are available at www.serdp.org/tes under the *National* tab.

Regional Workshops

As a direct outcome of the national symposium, SERDP, ESTCP, and Legacy began planning a series of regionally focused TER-S workshops aimed at identifying specific scientific research and management gaps for the Pacific Islands and the Southeast and Southwest regions of the United States.

Pacific Islands Region TER-S Workshop

June 6-8, 2006 Honolulu, Hawaii

DoD has a vested interest in maintaining training capabilities throughout the Hawaiian Archipelago and Pacific Islands region. In the Hawaiian Islands alone, there are more than 15 military installations including ranges encompassing more than 200,000 acres of land. Further, these lands span coastal, inland aquatic, dry and wet forest, and other ecosystems and support at least 100 threatened or endangered species. With implementation of the 2005 Base Realignment and Closure action plan and force realignment, the military footprint in the Pacific Islands region will increase significantly.

Specific objectives of this regional workshop were to (1) assess TER-S management needs among the Pacific Islands region; (2) examine the current state of practice within DoD for TER-S management; (3) identify gaps in knowledge, technology, and management; and (4) prioritize investment opportunities to address these gaps. The workshop focused on identifying species-related, system-level, and non-native invasive species (NIS) issues, as well as on strengthening DoD partnerships with federal and state agencies, academic institutions, and NGOs throughout the region.

See REGIONAL TER-S WORKSHOPS, page 3



Workshop discussions encompassed topics of interest to all three programs. Priority information gaps and management needs identified at the Pacific Islands Region TER-S Workshop included:

- **Management and Restoration of the Dry Forest Ecological System.** Although it is generally accepted that tropical dry forests are the most degraded and endangered ecosystems in the Pacific, relatively little is known about their historical composition, structure, and function as altered by legacy land use and effective approaches to their restoration. Scientists and land managers must identify and develop tools and approaches to understand the scope of and opportunities for restoration as well as to overcome barriers to restoration.
- **Ecological Approaches to Break the Non-Native Grass-Wildfire Cycle.** Because of the rapid and

During the Pacific Islands Region TER-S Workshop in June 2006, participants toured Marine Corps Base Hawaii, Kaneohe Bay to see firsthand the unique natural resources and challenges faced by DoD in this region and examples of successful on-the-ground TER-S conservation projects that support the mission. Efforts to reduce the risk of brushfires, for example, benefit not only range operations and training capabilities but also habitat for birds including the red-footed booby.

- ◆ widespread expansion of NIS grasses throughout the Pacific Islands and the resulting increase in fuel loads, wildland fire now poses a significant threat to native habitats, particularly dry forest systems, and to the safe conduct of military operations. Breaking the invasive species/wildfire cycle is among the greatest challenges facing DoD land managers and researchers in the Pacific Islands region today.
- **Improved Understanding of Freshwater Ecosystem Composition, Structure, and Function.** To assess the response of Pacific Island freshwater streams to various natural, military, and other anthropogenic stressors, information on their ecology is needed in addition to indicators for and thresholds associated with these impacts. The effects of terrestrial invasive species control activities also must be studied, and appropriate restoration methods for freshwater streams and associated watersheds need to be developed.

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REGIONAL TER-S WORKSHOPS, from page 3

• **Early Detection, Rapid Response, Pathway Assessment, and Control Methods for NIS.** Because the Pacific Islands have high levels of endemism and because species on these islands are highly susceptible to the impacts of invasion, protecting native ecosystems from the threat of NIS is critical. Preventing the introduction and spread of NIS—including algae, seaweed, grasses, pigs, and snakes—must be accomplished cost-effectively.

SERDP, ESTCP, and Legacy are using the workshop discussions and outcomes to help guide their investments for addressing TER-S in the Pacific Islands region. Indeed, SERDP already released two FY 2008 Statements of Need based on the results of this workshop (*Managing and Restoring the Dry Forest*

Ecological System in the Pacific Islands [SISON-08-01] and Impacts of Military Activities and Invasive Species on Pacific Island Freshwater and Near-Shore Marine Ecosystems [SISON-08-02]), and Legacy has funded five efforts for this region as part of its FY 2007 request for proposals. Additionally, the Hawaii Conservation Alliance reported in January 2007 to an interagency working group that, as a direct outcome of this workshop, a new Pacific Region-based interagency group now meets regularly to coordinate research and management agendas, thereby improving the effectiveness of regional TER-S conservation.

Full proceedings are available under the *Pacific Isle* tab at www.serdp.org/tes.

Southeast Region TER-S Workshop

February 27 - March 1, 2007 Cocoa Beach, Florida

As with the Pacific Islands region, DoD has a strong interest in maintaining its mission flexibility in the Southeast. Installations within this region span many ecosystem types including longleaf pine, bottomland hardwoods, and coastal barrier islands, which provide essential habitat for more than 200 TER-S. Further, they are situated in areas with significant concentrations of urban, agricultural, and industrial use that have severely impacted historic amounts and conditions of the aquatic and terrestrial ecosystems on which TER-S depend.

Specific objectives of this regional workshop were to (1) assess TER-S management needs within a regional context, with an emphasis on system-level and cross-boundary approaches; (2) assess these approaches for their potential to keep common species common while recovering or enhancing TER-S populations; (3) examine the current state of the science and practice within DoD for such holistic approaches; (4) identify potential partners and existing partnership structures whose focus is, at least in part, meeting TER-S conservation objectives; (5) identify

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Photo courtesy of Maureen Mulligan/TNC

DoD lands within the southeastern United States span many ecosystem types, including longleaf pine, bottomland hardwoods, and coastal barrier islands, and contain more than 200 TER-S of which the gray bat is one example. In guiding future investments by SERDP, ESTCP, and Legacy, the Southeast Region TER-S Workshop held in February 2007 emphasized TER-S management from an ecological system perspective that encompasses numerous land jurisdictions.

Emerging Results from WAA Program Validate Comprehensive and Cost-Effective Approach

In 2005, ESTCP initiated a program to demonstrate various technologies, either alone or in combination, as tools for wide area assessment (WAA) of areas suspected of containing unexploded munitions at DoD sites.

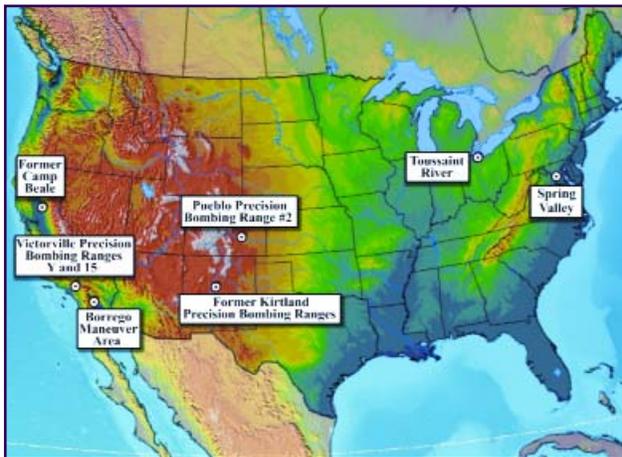
The objectives of the pilot program are to demonstrate the effectiveness of this approach in supporting decisions concerning munitions on large former range areas and to understand the effects of site-specific factors such as terrain, vegetation, and munitions type on the applicability of the technologies.

ESTCP also assembled an advisory group consisting of federal and state regulators as well as representatives from the Services to provide input on the WAA Program. Through ESTCP's WAA Program, projects were awarded funding to demonstrate high- and low-altitude airborne data collection technologies, ground-based vehicular surveys, and statistical and geographic information system (GIS) tools for data analysis.

Three sites were selected for demonstrations in 2005—Pueblo Precision Bombing Range #2 in Otero County, Colorado; the former Kirtland Precision Bombing Ranges in Albuquerque, New Mexico; and Victorville Precision Bombing Ranges Y and 15 in San Bernardino County, California. In 2006, ESTCP extended the pilot program to demonstrate technologies on more challenging sites, including two partially wooded sites with rougher terrain at the former Camp Beale in California and Spring Valley in Washington, D.C., as well as an underwater site at the Toussaint River near the former Erie Army Depot, Ohio. To support the demonstration at the Toussaint River, a marine magnetometer array towed behind a pontoon boat was used to survey statistically planned transects.

Results to date demonstrate that wide area assessment is a technically sound and cost-effective approach. At the first three demonstration sites, the high-airborne data easily confirmed the known target circles and

identified many previously unknown surface features related to munitions. The helicopter magnetometry and ground transect data complemented those findings by showing high and low concentrations of anomalies in areas that correspond with the high-altitude data. Initial results from the demonstrations clearly illustrate that the technologies are effective.



Through the ESTCP WAA Program, technology demonstrations at the DoD sites shown here are validating a comprehensive approach to wide area assessment of sites suspected of containing munitions.

When applied to suspected munitions sites, these WAA technologies can separate parcels with extensive munitions use from those that show no evidence of munitions activity. This information will facilitate future investigation and remediation decisions.

Additional information on this program and its associated projects can be found at www.estcp.org under the *Technologies* link. In particular, a video has been developed to provide an overview of the WAA Program and is now available at <http://www.estcp.org/links/WAA-Pilot-Video.cfm>.

Discrimination Study to Engage Regulators in Assessing Technology Capabilities to Support Field Decisions

While significant progress has been made in technologies that discriminate unexploded ordnance (UXO) from metal objects that pose no risk, routine implementation requires demonstrations at real UXO sites under real-world conditions. Any attempt to declare detected anomalies harmless with no need for further investigation requires demonstration to regulators and project managers of not only individual technologies, but an entire decision-

making process. To address these challenges, the ESTCP Discrimination Pilot Study was planned as the first phase of an ongoing effort. The objectives are to (1) test and validate detection and discrimination capabilities of currently available and emerging technologies on real sites under operational conditions, and (2) in cooperation with regulators and program managers, investigate how discrimination technologies can be implemented in UXO cleanup operations.

Through the ESTCP Discrimination Pilot Study, established and emerging sensor systems and analysis approaches will be used to collect data on approximately 20 acres of an artillery target at Camp Sibert, Alabama. The pilot study will assess the performance of approaches to munitions detection and discrimination ranging from traditional approaches to processes that utilize various degrees of advanced post-detection signal processing. To help guide efforts conducted under the Discrimination Pilot Study, the ESTCP Program Office has assembled an advisory group of State regulators, Environmental Protection Agency personnel, and Service representatives who will meet regularly to review and provide input on the study's objectives, design, execution, and products.

Demonstration Site Selection Process Kicks Off Innovative Technology Transfer Effort

Congress directed ESTCP in the 2007 Defense Appropriation Conference Report to execute a UXO Innovative Technology Transfer project. This project will conduct evaluations of innovative UXO technologies at military munitions response sites in coordination with remediation project managers to accelerate the transfer of effective new technologies into field use. Subsequently, in a memorandum to Service representatives on December 6, 2006, ESTCP requested information on military munitions response sites interested in participating in the testing of innovative UXO technologies.

ESTCP anticipates multiple innovative technology demonstrations being conducted through this effort. Potential technologies to be demonstrated include site planning tools, wide area assessment technologies, land and water geophysical survey technologies, and geophysical data processing technologies. ESTCP is working directly with interested project managers to select innovative technologies of interest and establish demonstration objectives and plans. ♦

the military's ability to fulfill its mission by ensuring it has access to the highest quality natural resources, including clean air and water, Mr. Beehler said.

"Historically at DoD, environmental concerns have been separate from energy concerns," said Mr. Beehler. "That's changed in recent years. The military is now taking a more holistic approach to these issues. And SERDP and ESTCP are uniquely positioned to help bring about a successful marriage of the environment and energy."

Addressing another critical DoD issue during the Plenary Session was Rear Admiral James A. Symonds, Director of the Chief of Naval Operations, Environmental Readiness Division of the U.S. Navy. Active sonar training is vital to national security; however, there are concerns about its potential effects on marine mammals.

SERDP is playing a major role in helping the Navy study how sonar may affect marine mammals. Among the questions under study are whether marine mammal behavior is modified by exposure to Navy sonar and whether there are long-term effects on resident marine mammal populations from sustained naval activity. Also important is determining whether and how many marine mammals are present in an operating area at a given time.

"The bottom line is we need to know more than we know now," said Rear Admiral Symonds. "We need solid scientific evidence to answer these questions. SERDP research is extremely important to us in this area."

At the conclusion of the Plenary Session, Mr. Bradley P. Smith, Executive Director of SERDP, and Dr. Jeffrey A. Marqusee, Director of ESTCP, presented four SERDP and two ESTCP Project-of-the-Year Awards that recognize outstanding research and technology developments with significant benefits to DoD. Recipients of this prestigious honor and a description of their award-winning projects follow.

SERDP Project of the Year, Munitions Management. Dr. Wesley Cobb, University of Denver, Research Institute, Denver, Colorado—*Acoustic Identification of Unexploded Ordnance*. Dr. Cobb developed a technique that uses acoustic waves to quickly and safely identify live munitions during remediation of sites suspected of containing unexploded ordnance (UXO). This innovative approach results in significant cost savings by distinguishing inert munitions from explosive-filled munitions. "It also results in improved safety by avoiding unnecessary detonations and their unintended environmental consequences," said Dr. Marqusee. Following its rapid development, this technology has transitioned to ESTCP for field demonstration.

SERDP Project of the Year, Environmental Restoration. Dr. Linda Abriola, Tufts University, Medford, Massachusetts—*Evaluation of the Benefits of DNAPL Source Zone Treatment*. Dr. Abriola and her colleagues integrated laboratory, field, and modeling studies of dense nonaqueous phase liquid (DNAPL) contaminants in groundwater. As a result of this cutting-edge science, DoD now has a much improved understanding of the impacts of specific source zone treatment options on contaminant fluxes and how DNAPL contaminant plumes develop and evolve. This project provides site managers with protocols to assess the effectiveness and the costs and benefits of source zone treatment options, ensuring that remediation dollars produce a real impact in terms of reducing risks to human health and the environment.

SERDP Project of the Year, Weapons Systems and Platforms. Dr. Robert Shortridge, Naval Surface Warfare Center, Crane Division, Crane, Indiana—*Elimination of Perchlorate Oxidizers from Pyrotechnic Flare Compositions*. Dr. Shortridge and his team developed alternatives to perchlorate oxidizers used in decoy and signal flares. These alternative

compositions, which consist of high-energy metallic fuels and alloys and non-chlorine-containing inorganic oxidizers, contain no perchlorate. They ensure that signal and decoy flare devices have equal or superior performance compared with existing flares, eliminate the potential for groundwater contamination from perchlorate, and result in significantly lower life-cycle costs. "Because of this technology, we can now continue realistic training using these devices without fear of contaminating soil or water with perchlorate," said Mr. Smith. A full-scale demonstration of the performance of flares containing these compositions is now under way through ESTCP.

SERDP Project of the Year, Sustainable Infrastructure. Dr. James Westervelt, U.S. Army Corps of Engineers, Engineer Research and Development Center—Construction Engineering Research Laboratory (CERL) Champaign, Illinois, and Dr. Brian Deal, University of Illinois at Urbana-Champaign—*A Dynamic Spatial Decision Support System for Sustainable Military Communities*. The researchers adapted and extended the Land use Evolution and impact Assessment Model (LEAM) to address military-specific issues, creating military-LEAM or mLEAM. The Sustainable Installations Regional Resource Assessment (SIRRA) model, of which mLEAM is a component, provides the military with a sophisticated screening tool to assess sustainability issues on and around the base. The technologies advanced by Dr. Westervelt, Dr. Deal, and their team enable high-quality, targeted land-use planning that allows military commanders and community leaders to work together to make long-term regional development decisions that benefit both the base and the surrounding civilian community. "These technologies are like SimCity for military installations," said Mr. Smith.

See SYMPOSIUM, page 7

Program Development Update

SERDP

SERDP released its FY 2008 Core Solicitation on November 9, 2006. By the deadline of January 4, 2007, the Program Office received 199 pre-proposals in response to 17 Statements of Need (SON). SERDP Staff reviewed these pre-proposals, and by February 1, extended requests for full proposals to the most qualified pre-proposals that met the relevance criterion. Eighty-three full proposals from the private sector and ninety-four proposals in response to the federal Call for Proposals were received by March 8. In April, these private sector and federal proposals underwent an independent peer review evaluation with a subsequent review in June by the SERDP Technical Committees (STC).

SERDP also released its FY 2008 SERDP Exploratory Development

(SEED) Solicitation with two SONs on November 9. SEED efforts are high risk and potentially high payoff projects that last no longer than one year and cost less than \$100,000. Fifty-three SEED proposals, which also were due March 8, will undergo Staff review and be reviewed in the proposal selection meetings held by the STCs in June.

For further details on the solicitations listed above, please visit www.serdp.org under the *Funding Opportunities* link.

ESTCP

On January 4, 2007, ESTCP released both an FY 2008 Call for Proposals to non-DoD federal organizations and a Broad Agency Announcement (BAA) for the private sector requesting pre-proposals. The Call for Proposals and BAA solicited pre-proposals in five

topics within the Environmental Restoration, Munitions Management, and Sustainable Infrastructure focus areas. Also on January 4, a Call for Proposals was sent to DoD organizations soliciting pre-proposals in the four focus areas: Environmental Restoration, Munitions Management, Sustainable Infrastructure, and Weapons Systems and Platforms. By the March 15 deadline, 130 pre-proposals were submitted from DoD organizations, and 157 pre-proposals were received in response to the BAA. The ESTCP Technical Committees (ETC) will review relevant pre-proposals and recommend that successful proposers submit full proposals in early August for further review by ETCs in September.

For additional details on all ESTCP solicitations, please visit www.estcp.org under the *Opportunities* link. ♦

SYMPOSIUM, from page 6

ESTCP Project of the Year. Dr. Kirk Hatfield, University of Florida, Gainesville—*Demonstration and Validation of Water and Solute Flux Measuring Device.* Estimating groundwater flow and contaminant discharge is fundamental to understanding the nature and extent of contamination at DoD sites. Dr. Hatfield and his team demonstrated and validated the Passive Flux Meter as a tool to quantify contaminant fluxes from known source zones. Lauding the project as demonstrating a “new paradigm,” Dr. Marqusee said the technology is expected to result in significant cost savings through more accurate groundwater monitoring data and risk analyses to support risk-based remediation decisions.

ESTCP Project of the Year. Mr. Bill Nickerson, NAVAIR Materials Engineering, Patuxent River, Maryland—*Non-Chromate Aluminum Pretreatments.* Mr. Nickerson and his team demonstrated and validated

alternative chromate-free aluminum pretreatments for use on weapons systems. For decades, all weapons systems pretreatments for aluminum included hexavalent chromium, a strictly regulated, known human carcinogen. Pretreatments are necessary for corrosion protection and other functions that prolong the life of weapons systems. This new technology, now used across all the Services, eliminates worker exposure to chromium, complies with environmental regulations, and reduces liability and risk associated with chromium-containing wastes. “This project shows the benefits of demonstrating a technology across multiple services, which leads to rapid transition to the field,” said Dr. Marqusee.

The Plenary Session kicked off the two-and-a-half-day Symposium & Workshop that featured a comprehensive technical program focusing on 12 environmental topic areas of high priority to DoD, as well as an Exhibit

Hall of poster presentations and exhibit booths showcasing a record number of technologies and scientific advancements from a variety of environmental research programs. Together, the Technical Session and Exhibit Hall venues offered attendees valuable opportunities to exchange information and discuss opportunities for technology transfer and partnerships.

Additional information about the 2006 Symposium & Workshop, including the Project-of-the-Year Awards as well as preliminary information about the 2007 Symposium & Workshop scheduled to be held December 4–6, 2007, in Washington, D.C., is available at www.serdp.org under the *Symposiums & Workshops* link or at www.estcp.org under the *Related Events* section of the *Calendar/Events* link. In early June, both web sites will provide details on the Call for Poster Abstracts for the 2007 Symposium & Workshop. Abstracts will be due July 31, 2007. ♦

PLENARY SESSION

NETWO



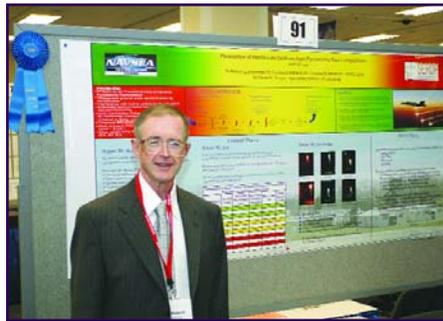
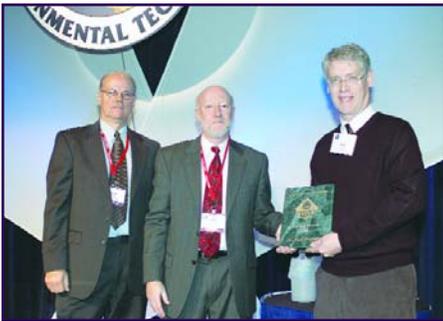
During the opening Plenary Session, three distinguished speakers addressed environmental issues of critical concern to DoD and encouraged participants to seek innovative approaches to help DoD achieve sustainability. Clockwise from top left: Rear Admiral James Symonds, Director of the Chief of Naval Operations (CNO) Environmental Readiness Division (N45); Mr. Alex Beehler (right), Assistant Deputy Under Secretary of Defense (Environment, Safety and Occupational Health) with SERDP Executive Director Mr. Bradley Smith (left) and ESTCP Director Dr. Jeffrey Marqusee; Mr. Lester Brown, acclaimed author and founder and President of the Earth Policy Institute; and Mr. Brown signing his book *Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble*.



SERDP and ESTCP welcomed a record number of attendees and provided attendees numerous opportunities to network with professionals.



PARTNERS IN ENVIRONMENTAL TECHNOLOGY



Clockwise from top left: Dr. Kirk Hatfield (right) received his ESTCP Award from SERDP Executive Director Mr. Bradley Smith (left) and ESTCP Director Dr. Jeffrey Marqusee; SERDP Weapons Systems and Platforms Award recipient Dr. Robert Shortridge showcased his cutting-edge research during a poster session; Mr. Smith (left) and Dr. Marqusee (right) congratulated Dr. Brian Deal (second from left) and Mr. Bill Goran (on behalf of Dr. James Westervelt), recipients of the SERDP Sustainable Infrastructure Award; SERDP Munitions Management Award recipient Dr. Wesley Cobb (middle) and members of his research team displayed a poster highlighting their novel technology; Dr. Linda Abriola (center, back row) and her team with Mr. Smith (left, back row) and Dr. Marqusee (right, back row), received the SERDP Environmental Restoration Award; ESTCP Award recipient Mr. Bill Nickerson presented his award-winning technology in the Exhibit Hall.



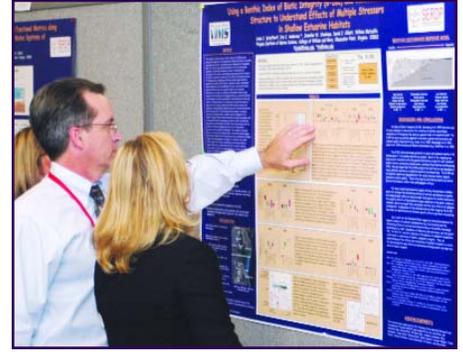
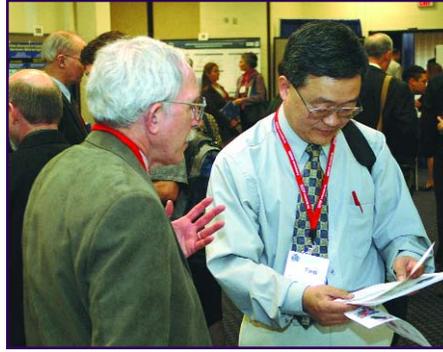
PROJECT-OF-THE-YEAR AWARDS

WORKING



Ideas at the annual Symposium & Workshop and networking with the more than 1,000 environmental professionals.

EXHIBIT HALL



The record-breaking number of posters and booths in the Exhibit Hall stimulated interactions focused on transitioning information and fostering partnerships for future collaboration.



TECHNOLOGY TECHNICAL SYMPOSIUM & WORKSHOP



Marriott Wardman
Park Hotel
Washington, D.C.
September 28-30, 2006



Stimulating presentations on 12 focused topical areas encouraged audience participation, follow-on discussion, and networking during the technical sessions.



TECHNICAL SESSIONS

SERDP and ESTCP Award FY 2007

Throughout 2007, new initiatives in all SERDP and ESTCP focus areas will

SERDP and ESTCP initiatives in Environmental Restoration focus on the technologies and strategies required to clean and restore contaminated sites, both to ensure that the lands can continue to be used for military training and to protect the health of the people who live and work on and near these sites. In 2007, SERDP research and development efforts are examining:

- ecosystem risk and recovery at contaminated sediment sites;
- complexities associated with groundwater remediation in fractured geology;
- mechanisms responsible for destruction of cis-dichloroethene (cis-DCE) and vinyl chloride (VC) in groundwater;
- effects of sampling on the accuracy and efficacy of molecular biological tools (MBT); and
- biomarkers that will enhance efforts to remediate contaminated groundwater.

ESTCP investigators are demonstrating state-of-the-art technologies and approaches for characterizing, remediating, and monitoring contaminants of concern in groundwater, soil, and sediments, as well as developing guidance and decision support tools for remedial project managers to select, implement, and optimize technologies in the field. Results from these initiatives will help DoD implement efficient and cost-effective approaches to remedy the effects of past practices.

SERDP Research

Sediments/Risk Assessment and Bioavailability Issues

Sediment Ecosystem Assessment Protocol (SEAP): An Accurate and Integrated Weight-of-Evidence Based System (ER-1550)

Principal Investigator: Allen Burton/Wright State University

The objective of this project is to develop an efficient, accurate, and integrated approach for assessing ecosystem risk and recovery at sites where contaminated sediments exist or previously existed. SEAP will incorporate rapid in-situ hydrological, chemical, biological, and toxicological measurements and provide concise, decision-oriented scientific and ecological information to improve the overall management of contaminated sediment sites.

Bacterial and Benthic Community Response to Inorganic and Organic Sediment Amendments (ER-1551)

Principal Investigator: Yolanda Arias-Thode/SPAWAR Systems Center San Diego

Amendments increasingly are being added to contaminated sediments to sorb, degrade, transform, or immobilize contaminants and to stimulate growth of indigenous microorganisms that support these processes. This project will evaluate toxicity and bioaccumulation in several benthic community surrogates exposed to sediments with and without amendments currently used for remediation of mixed heavy metal contamination at DoD sites, providing a scientific basis for understanding the effects on benthic biota and the real potential for metal immobilization.

Measurement and Modeling of Ecosystem Risk and Recovery for In Situ Treatment of Contaminated Sediments (ER-1552)

Principal Investigator: Richard Luthy/Stanford University

This project will develop a comprehensive strategy to assess the ecological recovery of a contaminated sediment site after in-situ treatment. The strategy will incorporate rapid, inexpensive assessment tools to measure contaminant concentrations in the sediment pore water, a biodynamic modeling approach to predict contaminant burden at the base of the food web, and a general model to predict the ecological characteristics of recovery.

Chlorinated Solvents/DNAPL Source Zone Remediation

Contaminant Mass Transfer During Boiling in Fractured Geologic Media (ER-1553)

Principal Investigator: Ron Falta/Clemson University

Many DoD sites with chlorinated volatile organic compound (CVOC)-contaminated groundwater are underlain by fractured rocks or soils with significant matrix porosity. Remediation options are limited because the low matrix permeability and unknown fracture locations complicate fluid or chemical delivery. Thermal methods hold some promise because heat can be efficiently transferred without fluid flow. The objective of this project is to evaluate the contaminant mass removal process from heated low permeability matrix materials that are bounded by a depressurized fracture network.

DNAPL Dissolution in Bedrock Fractures and Fracture Networks (ER-1554)

Principal Investigator: Charles Schaefer/Shaw Environmental and Infrastructure

Processes impacting the dissolution of dense nonaqueous phase liquids (DNAPL) in fractured bedrock are not well understood, limiting efforts to predict the longevity and persistence of DNAPL sources, select appropriate remedial technologies, effectively design and implement these technologies, evaluate remedial performance, and estimate remedial time frames. This project will evaluate DNAPL dissolution in fractured geologic settings during in situ chemical oxidation and bioaugmentation and will investigate the impact of incremental DNAPL removal on groundwater quality.

Chlorinated Solvents/Dissolved Phase Remediation

A Comparison of Pump-and-Treat, Natural Attenuation, and Enhanced Biodegradation to Remediate Chlorinated Ethene-Contaminated Fractured Rock Aquifers (ER-1555)

Principal Investigator: Allen Shapiro/U.S. Geological Survey

This project will evaluate and compare CVOC removal and destruction from the well-characterized Naval Air Warfare Center site in West Trenton, New Jersey, by three remediation technologies—pump and treat, monitored natural attenuation (MNA), and enhanced biodegradation—with the ultimate goal of better understanding the hydrogeologic and biogeochemical mechanisms that control contaminant removal and destruction in fractured rock. Results from this project will be transferable to other fractured-rock sites.

Initiatives in Environmental Restoration

be highlighted. This issue features Environmental Restoration efforts.

Characterization of Microbes Capable of Using Vinyl Chloride as a Sole Carbon and Energy Source by Anaerobic Oxidation (ER-1556)

Principal Investigator: David Freedman/Clemson University

At anaerobic sites where there is field evidence for attenuation of vinyl chloride (VC) but without accompanying evidence of biodegradation by accumulation of ethene or ethane, there is currently no efficient method to document the occurrence of anaerobic oxidation. The objective of this project is to culture and ultimately isolate and characterize a microbe capable of using VC as a sole source of carbon and energy by anaerobic oxidation. Once such an organism has been identified, it will be possible to develop a biomarker for use in detecting the presence of similar microbes in situ.

Elucidation of the Mechanisms and Environmental Relevance of cis-Dichloroethene and Vinyl Chloride Biodegradation (ER-1557)

Principal Investigator: Evan Cox/GeoSyntec Consultants

The objectives of this project are to (1) elucidate the aerobic and anaerobic oxidation pathways and reaction kinetics for cis-1,2-dichloroethene and VC; (2) identify and isolate organisms capable of mediating the reactions; (3) develop and validate molecular biological tools, including compound-specific isotope analysis and DNA-based analyses, for assessment of the degradation mechanisms; and (4) determine the relevance of the various biodegradation mechanisms at field scale so that DoD can better design, implement, monitor, and validate MNA and enhanced in situ bioremediation remedies.

Microbial Dichloroethene and Vinyl Chloride Oxidation and the Fate of Ethene and Ethane Under Anoxic Conditions (ER-1558)

Principal Investigator: Paul Bradley/U.S. Geological Survey

This project will assess the kinetics of microbial degradation of dichloroethene (DCE) and VC to carbon dioxide, the impact of dissolved hydrogen concentrations on the pathways and final products of microbial degradation of VC, and the potential for microbial degradation of ethene and ethane under anoxic conditions. The results will lead to an improved understanding of the biogeochemical conditions under which microbial degradation of DCE and VC to products other than ethene and ethane may be an important component of in situ chloroethene bioremediation.

Site Characterization/Molecular Biological Tools

Cryogenic Collection of Complete Subsurface Samples for Molecular Biological Analysis (ER-1559)

Principal Investigator: Rick Johnson/Oregon Health and Science University

To reduce the time and cost of environmental restoration activities, this project seeks to integrate diagnostic tools based on molecular biological tools (MBT) into widely used protocols applicable to all phases of remediation. Specific objectives are to (1) develop and evaluate a sampling methodology for cryogenic collection of "complete" subsurface core samples (i.e., water plus aquifer solids) for MBT analysis and (2) evaluate the applicability of cryogenic cores for a suite of MBTs important for subsurface remediation.

Impacts of Sampling and Handling Procedures on DNA- and RNA-Based Microbial Characterization and Quantification (ER-1560)

Principal Investigator: Francis de los Reyes/North Carolina State University

To accurately evaluate the performance of groundwater bioremediation processes, methods are needed that can quantify the populations and the in situ activity of relevant groups of microorganisms. Molecular biological techniques that rely on analysis of DNA and RNA have been used to determine the microbial community structure or levels of specific organisms in groundwater and soil. The objective of this project is to determine the effects of sampling and handling on these techniques.

Standardized Procedures for Use of Nucleic Acid-Based Tools (ER-1561)

Principal Investigator: Carmen Lebrón/Naval Facilities Engineering Service Center

Use of MBTs for the detection and quantification of biomarkers in environmental samples is rapidly increasing. The objective of this project is to obtain a fundamental understanding of the factors that affect how to optimize the quantification and interpretation of nucleic acid markers in groundwater samples and to build a foundation for a standardized method using this information. Standardization will improve the accuracy and reproducibility of MBT data, build confidence in the approach, and ultimately provide the basis for science-based site management decisions.

Prokaryotic cDNA Subtraction: A Method to Rapidly Identify Functional Gene Biomarkers (ER-1563)

Principal Investigator: Mary Jo Kirisits/University of Texas at Austin

Application of many MBTs is predicated on a prior knowledge of target nucleic acid sequences (i.e., biomarkers), and the current dearth of such biomarkers represents a fundamental barrier to the routine application of MBTs at DoD field sites. Through the combination of prokaryotic cDNA subtraction and reverse transcription real-time PCR (rRT-PCR), this project will rapidly identify functional gene biomarkers for perchlorate reduction in two environmental isolates that are phylogenetically distinct from the often-studied *Dechloromonas* perchlorate-reducing bacteria.

BioReD: Biomarkers and Tools for Reductive Dechlorination Site Assessment, Monitoring, and Management (ER-1586)

Principal Investigator: Frank Loeffler/Georgia Institute of Technology

In support of more accurately assessing, predicting, monitoring, and managing reductive dechlorination processes at contaminated DoD sites, this project will identify novel biomarkers and develop a suite of nucleic acid-based tools with an accompanying guidance protocol. Use of these tools in the field will improve the understanding of target gene presence, abundance, and expression, and thus, contaminant detoxification.

See ENVIRONMENTAL RESTORATION INITIATIVES, page 12

SERDP and ESTCP Award FY 2007

Throughout 2007, new initiatives in all SERDP and ESTCP focus areas will

Site Characterization/Molecular Biological Tools (continued)

Application of Microarrays and qPCR to Identify Phylogenetic and Functional Biomarkers Diagnostic of Microbial Communities That Biodegrade Chlorinated Solvents to Ethene (ER-1587)

Principal Investigator: Lisa Alvarez-Cohen/University of California at Berkeley

Commonly, biomarker development focuses on identifying nucleic acid sequences, peptides, proteins, or lipids of organisms that catalyze biodegradation. Such approaches do not address the roles of other organisms required to support or enhance the activity of dechlorinating organisms. This project seeks to identify 16S-rRNA-based phylogenetic and mRNA-based functional biomarkers diagnostic of microbial communities that support the robust growth and activity of chlorinated ethene-degrading organisms.

Molecular Biomarkers for Detecting, Monitoring, and Quantifying Reductive Microbial Processes (ER-1588)

Principal Investigator: Alfred Spormann/Stanford University
Microbially produced hydrogen is the direct substrate (reductant) for contaminant removal in many biological systems. Thus, the rate of hydrogen release and knowledge of competing hydrogen-consuming reactions are critical for the practitioner to guide successful remediation efforts. The hypothesis of this project is that by knowing the number and activity of microorganisms involved in hydrogen release and consumption, the in situ rates of reductive contaminant transformation, specifically of chloroethenes, can be predicted. Researchers will identify biomarkers to assess the groundwater contaminant degradative potential of a microbial population.

ESTCP Demonstrations

Sediments/Risk Assessment and Bioavailability Issues

Determination of Sediment Polycyclic Aromatic Hydrocarbon Bioavailability Using Supercritical Fluid Extraction and Ultra-Trace Porewater Analysis (ER-0709)

Principal Investigator: David Nakles/The RETEC Group, Inc.
This project will demonstrate and validate a sediment characterization protocol that uses estimates of the bioavailability of polycyclic aromatic hydrocarbons (PAH) to predict sediment toxicity and characterize risk to benthic aquatic life. The protocol uses one of two chemical measurements, supercritical fluid extraction (SFE) and ultra-trace porewater (UTP), to estimate site-specific PAH bioavailability in sediments, and the U.S. Environmental Protection Agency hydrocarbon narcosis model to predict the resulting sediment toxicity. Such data will support site-specific management strategies.

Chlorinated Solvents/Assessing Vapor Intrusion

Application of Advanced Sensor Technology to DoD Soil Vapor Intrusion Problems (ER-0702)

Principal Investigator: Rob Hinchee/Integrated Science & Technology, Inc.

Vapor intrusion is an emerging problem involving the entry of vapors into inhabited structures from underlying contaminated soils or groundwater. Presently, there are no commercially available sensor products adapted to or proven for this application. This project will screen existing and emerging advanced sensor technologies and build and demonstrate the best sensor packages possible for vapor intrusion applications.

Protocol for Tier 2 Evaluation of Vapor Intrusion at Corrective Action Sites (ER-0707)

Principal Investigator: Thomas McHugh/Groundwater Services, Inc.
This project will develop and validate Tier 2 procedures for screening vapor intrusion at corrective action sites along with exit criteria indicating no further need for site evaluation. These procedures will fill the current gap in available guidance documents between generic (Tier 1) screening concentrations and detailed site investigations of vapor intrusion. The development of validated Tier 2 vapor intrusion screening procedures and focused Tier 3 investigation methods is likely to significantly reduce the number of DoD sites requiring extensive investigation or presumptive remediation.

Chlorinated Solvents/DNAPL Source Zone Remediation

Decision and Management Tools for DNAPL Sites: Optimization of Chlorinated Solvent Source and Plume Remediation Considering Uncertainty (ER-0704)

Principal Investigator: Ron Falta/Clemson University
Leveraging several recent SERDP- and ESTCP-supported efforts, this project will develop an integrated modeling tool to help site managers (1) simulate the changes in DNAPL source zones and dissolved plumes over time, with and without source remediation, source containment, and/or plume remediation; (2) explore site management decisions in a probabilistic framework such that uncertainty becomes an integral part of the decision-making process; and (3) compare the cost, risk, and performance of source treatment to plume management approaches.

Assessment of the Natural Attenuation of NAPL Source Zones and Post-Treatment NAPL Source Zone Residuals (ER-0705)

Principal Investigator: Paul Johnson/Arizona State University
This project will demonstrate assessment of source zone natural attenuation (SZNA) at two sites and produce illustrated guidance for application of the approach to other sites. The approach provides practical information on (1) whether SZNA is occurring, and if so, the natural processes contributing to SZNA; (2) the current rate of mass reduction associated with SZNA, and how it might change in the future; (3) long-

Initiatives in Environmental Restoration

be highlighted. This issue features Environmental Restoration efforts.

term implications of SZNA for future groundwater and vapor migration impacts; (4) sustainability of SZNA processes and rates; and (5) projected longevity of the NAPL source zone.

DNAPL Removal from Fractured Rock Using Thermal Conductive Heating (ER-0715)

Principal Investigator: Carmen Lebrón/Naval Facilities Engineering Service Center

Despite the fact that there have been no reported cases of fractured bedrock DNAPL sites where remediation has been restored to drinking water standards, there is still pressure to achieve strict remedial goals and absolute objectives at DNAPL sites. The objective of this project is to demonstrate and validate thermal conductive heating as a DNAPL remediation technique for fractured bedrock sites and to provide guidance on (1) when it makes sense to attempt aggressive remediation and (2) what type of performance can be expected from an aggressive technology application.

Improving Effectiveness of Bioremediation at DNAPL Source Zone Sites Applying Partitioning Electron Donors (ER-0716)

Principal Investigator: Carmen Lebrón/Naval Facilities Engineering Service Center

Partitioning electron donors (PED) are electron donors that partition directly into DNAPL, promoting the growth of dechlorinating biomass close to the DNAPL and enhancing DNAPL dissolution rates. This project will demonstrate and validate the application of a PED to improve the biologically enhanced dissolution rate of DNAPLs and, ultimately, to reduce costs associated with application of electron donors in source zones.

Combining Low-Energy Electrical Resistance Heating with Biotic and Abiotic Reactions for Treatment of Chlorinated Solvent DNAPL Source Areas (ER-0719)

Principal Investigator: Kira Lynch/U.S. Army Corps of Engineers, Seattle District

This project will demonstrate a combined technology approach—low-energy electrical resistance heating (ERH) and in situ bioremediation—for treatment of chlorinated solvent DNAPL source areas. This approach is expected to provide more rapid source area cleanup than the in situ technologies alone but without the high cost of conventional ERH. Collectively, this demonstration will provide key performance metrics that can be used to evaluate the potential for application of combined thermal and in situ treatments.

Chlorinated Solvents/Dissolved Phase Remediation

Use of Enzyme Probes for Estimation of Trichloroethene Degradation Rates and Acceptance of Monitored Natural Attenuation (ER-0708)

Principal Investigator: Michelle Hope Lee/North Wind Inc.

The objective of this project is to demonstrate the relationship between enzyme activity probes and contaminant degradation rates in support of documenting the occurrence at measurable rates of natural attenuation mechanisms.

Microcosm studies will be performed on samples collected from trichloroethene (TCE)-contaminated aquifers and will combine (1) enzyme-activity probes specific for aerobic oxygenase enzymes, (2) molecular techniques to provide

evidence in support of enzyme activity probes, and (3) contaminant transformation measurements to determine the rates of TCE cometabolism.

Energetic Compounds/Groundwater Remediation **Monitored Natural Attenuation of Explosives in Groundwater Using Stable Isotope Ratio Analysis (ER-0706)**

Principal Investigator: Farrukh Ahmad/Groundwater Services, Inc. Earlier MNA efforts at explosives-contaminated sites have been hampered by a general lack of tertiary lines of evidence, mainly because the transformation products are short-lived and difficult to quantify. This project will demonstrate an analytical method, gas chromatography-isotope ratio mass spectrometry, that focuses on the analysis of reactants rather than products. The existing MNA Protocol, developed with ESTCP support, will be bolstered for explosives-contaminated groundwater sites and a practical software decision tool for screening potential MNA sites will be supplied.

Remedial Process Optimization

Demonstration and Validation of GTS Long-Term Monitoring Optimization Software at Military and Government Sites (ER-0714)

Principal Investigator: Philip Hunter/Air Force Center for Environmental Excellence

This project will enhance the Geostatistical Temporal-Spatial (GTS) algorithm and its accompanying interface to provide a fully featured software technology for optimizing long-term monitoring (LTM) schemes. GTS uses a novel combination of statistical techniques to determine the optimum number and placement of wells given an existing LTM network and their optimal sampling frequency. The software technology will be validated at a variety of contaminated sites and hydrogeological environments.

Optimized Enhanced Bioremediation Through Four-Dimensional Geophysical Monitoring and Autonomous Data Collection, Processing, and Analysis (ER-0717)

Principal Investigator: Bill Major/Naval Facilities Engineering Service Center

The success of enhanced bioremediation is heavily dependent on emplacement of either amendments or barriers. Currently, site managers have limited tools to obtain near real-time information on emplacement success. The objective of this project is to demonstrate and validate an autonomous hydrogeophysical performance monitoring system that will provide actionable timely information on engineered remediation.

REGIONAL TER-S WORKSHOPS, from page 4

gaps in knowledge, technology, management, and partnerships that, if addressed, could improve implementation of system-level and cross-boundary approaches; and (6) prioritize investment opportunities to address gaps.

Four white papers prepared in advance of the workshop focused on emerging issues in forest health, aquatic priorities, connectivity in fragmented landscapes, and large-scale natural disturbance events such as hurricanes, as well as a field tour of Cape Canaveral Air Force Station highlighting its award-winning natural resource management program, set the stage for a successful series

of discussions. These discussions focused on information and partnership gaps that included: (1) silvicultural and vegetation management of open-canopied native pine ecosystems; (2) appropriateness of currently applied prescribed fire regimes; (3) improvement in our understanding of coastal ecosystems, especially in light of their currently altered conditions and in consideration of potential climate change impacts; and (4) tools to support watershed and TER-S management across jurisdictional boundaries.

Full proceedings will be available in late summer 2007 at www.serdp.org/tes under the *Southeast* tab.

Southwest Region TER-S Workshop

October 22-25, 2007 Tucson, Arizona

DoD is the responsible land manager for millions of acres of land throughout the Southwest, a region defined for this workshop as encompassing the Chihuahuan, Mojave, and Sonoran Deserts and associated embedded and transitional ecosystems. Installations in this region provide critical opportunities for military testing and training. These same installations provide essential habitat for approximately 110 TER-S. Across the region, the aquatic and terrestrial systems on which these species depend have been significantly altered by a variety of anthropogenic stresses that include urbanization, resource extraction, livestock grazing, military activities, and

recreational activities. In addition, the region is experiencing a long-term drought that could continue for the next few decades. This workshop seeks to strategically guide future investments by SERDP, ESTCP, and Legacy in the region and to facilitate long-term cooperation and coordination among regional stakeholders. For example, the Bureau of Land Management (BLM) is an important stakeholder because of the amount of withdrawn land that DoD uses in the Southwest and because, in many cases, BLM is the nearest neighbor.

Further information about this workshop will be released as it becomes available.

Collectively, these regional workshops are providing strategic guidance for SERDP, ESTCP, and Legacy to address TER-S and their associated ecosystems of interest to DoD. Advancing research priorities and using the resulting information to better manage listed and at-risk species offers a significant opportunity to benefit TER-S populations and sustain military testing and training lands. Similarly, to truly facilitate recovery of imperiled species and mitigate against the need for new listings, increased attention must be given to the management of TER-S from an ecosystem-based perspective that encompasses numerous land management jurisdictions throughout the region. These workshops represent a first step toward a long-term effort for stakeholders to work together to help DoD fulfill its military mission while protecting the valuable resources with which it is entrusted. For additional information on the national symposium and regional workshops supported by SERDP, ESTCP, and Legacy, please visit www.serdp.org/tes. ♦



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Plans are currently under way for the Southwest Region TER-S Workshop to be held October 22-25, 2007, in Tucson, Arizona. Participants will identify gaps in knowledge, technology, management, and partnerships that, if addressed, could improve implementation of system-level and cross-boundary approaches to TER-S management. The desert tortoise is but one of approximately 110 TER-S of management concern to DoD throughout this region.

Recent Additions to the Online Library

The following are a sample of new publications now available in the SERDP and ESTCP Online Library (<http://docs.serdp-estcp.org>). Access them by entering the project number (e.g., 0125) under Search Word. Other documents may be accessed by entering a keyword or selecting the relevant search filters.

Environmental Restoration

- Cost & Performance Report: Electrically Induced Redox Barriers for In Situ Treatment of Groundwater (ESTCP ER-0112)
- Final Report: Distribution and Fate of Energetics on DoD Test and Training Ranges (SERDP ER-1155)
- Final Report: Identification of Metabolic Routes and Catabolic Enzymes Involved in Phytoremediation of the Nitro-Substituted Explosives TNT, RDX, and HMX (SERDP ER-1317)
- Final Report: Performance Evaluation of Technology Demonstration for Dynamic Underground Stripping with Hydrous Pyrolysis Oxidation (DUS/HPO) Using a Single Well at Beale Air Force Base (ESTCP ER-0014)
- Final Report: Perchlorate Removal, Destruction, and Field Monitoring Demonstration (ESTCP ER-0312)
- Protocol: Technical Protocol for Characterizing Natural Attenuation of Chlorinated Solvent Groundwater Plumes Discharging into Wetlands (ESTCP ER-9913)

Munitions Management

- Cost & Performance Report: Low-Cost Hot Gas Decontamination of Explosives-Contaminated Firing Range Scrap (ESTCP MM-0032)
- Cost & Performance Report: Evaluation of Airborne Electromagnetic Systems for Detection and Characterization of Unexploded Ordnance (ESTCP MM-0101)
- Final Report: Acoustic Identification of Filler Materials in Unexploded Ordnance (SERDP MM-1382)
- Final Report: A Unified Approach to UXO Discrimination Using the Method of Auxiliary Sources (SERDP MM-1446)
- Final Report: Non-Thermal On-Site Decontamination and Destruction of Practice Bombs (ESTCP MM-0211)

Sustainable Infrastructure

- Final Report: Development of Biological Control for *Alliaria petiolata* (Garlic Mustard) (SERDP SI-1146)
- Final Report: Development and Validation of a Predictive Model to Assess the Impact of Coastal Operations on Urban Scale Air Quality (SERDP SI-1253)
- Final Report: Reduction of Solid Waste Associated with Military Rations and Packaging (SERDP SI-1270)
- Final Report: Evaluation of Ground Vibrations Induced by Military Noise Sources (SERDP SI-1410)

Weapons Systems and Platforms

- Final Report: Reduced PM2.5 Emissions for Military Gas Turbine Engines Using Fuel Additives (SERDP WP-1179)
- Final Report: Environmentally Benign Stab Detonators (SERDP WP-1362)
- Final Report: Validation of HVOF Thermal Spray Coatings as a Replacement for Hard Chrome Plating on Hydraulic/Pneumatic Actuators (ESTCP WP-0038)
- Final Report: Electrospray Deposition for Depot- and Field-Level Component Repair and Replacement of Hard Chromium Plating (ESTCP WP-0202)
- Final Report: Effect of Biodiesel on Diesel Engine Nitrogen Oxide and Other Regulated Emissions (ESTCP WP-0308)



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

INFORMATION BULLETIN

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

MAY 2007

May 8-11

Munitions Management (MM) In-Progress Review (IPR) meetings (ongoing projects)

May 11

Munitions Management (MM) ESTCP Technical Committee (ETC) downselect meeting (closed meeting)

May 14-18

Sustainable Infrastructure (SI) In-Progress Review (IPR) meeting (ongoing projects)

May 30-31

Environmental Restoration (ER) ESTCP Technical Committee (ETC) downselect meeting (closed meeting)

JUNE 2007

June 1

Sustainable Infrastructure (SI) ESTCP Technical Committee (ETC) downselect meeting (closed meeting)

June 5

Weapons Systems and Platforms (WP) ESTCP Technical Committee (ETC) downselect meeting (closed meeting)

June 6-7

Weapons Systems and Platforms (WP) SERDP Technical Committee (STC) selection meeting (closed meeting)

June 13-14

SERDP Scientific Advisory Board (SAB) meeting, Watervliet, New York

June 25-26

Sustainable Infrastructure (SI) SERDP Technical Committee (STC) selection meeting (closed meeting)

June 27

Munitions Management (MM) SERDP Technical Committee (STC) selection meeting (closed meeting)

June 28-29

Environmental Restoration (ER) SERDP Technical Committee (STC) selection meeting (closed meeting)

RELATED CONFERENCES & EVENTS

June 25-29

U.S. Army Corps of Engineers Infrastructure Systems Conference (ISC)
Detroit, Michigan

For more information, visit <http://www.usaceisconf.org/>.

July 30-August 3

2007 Sustaining Military Readiness Conference
Orlando, Florida

For more information, visit <http://www.sustainingmilitaryreadiness2007.com>.

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