PARTNERS IN ENVIRONMENTAL TECHNOLOGY

SERDP Strategic Environmental Research and Development Program

ESTCP

INFORMATION BULLETIN

SPRING 2005
NUMBER 23

INSIDE THIS ISSUE

2 Workshops Help Define Research Needs

5 Recent Advances in UXO Detection

6 FY 2006 Program Updates

— Symposium 2004 —

For event highlights, see this issue's insert.

Distinguished Speakers Pose Novel Environmental Approaches at SERDP and ESTCP Symposium

Project-of-the-Year Awards Highlight Solutions to DoD's Environmental Problems

During the opening Plenary Session of the recent Partners in Environmental Technology Technical Symposium & Workshop, four distinguished speakers representing Congress, the Department of Defense (DoD), and the sustainability movement urged the 750 participants to seek innovative approaches to address DoD's environmental challenges. The SERDP- and ESTCP-sponsored Symposium was held November 30-December 2, 2004, at the Marriott Wardman Park Hotel in Washington, D.C. This annual conference promotes partnerships among federal agencies, private industry, and academia as well as with technology developers, end users, and regulators.

SERDP Executive Director **Mr. Bradley P. Smith** introduced **The Honorable Earl Blumenauer** from the 3rd Congressional District of Oregon, who emphasized the need for a systematic approach to address the costs and liability associated with detecting and remediating unexploded ordnance (UXO). Providing a perspective from the field, **Brigadier General Willie J. Williams,** Assistant Deputy Commandant of Installations and Logistics (Facilities), U.S. Marine Corps, stressed that "operational readiness depends on environmental responsibility." **Ms. Janine M. Benyus,** renowned author and lecturer, then introduced the concept of biomimicry—imitating natural processes to solve technical and environmental problems—as a tool that can be applied to DoD's environmental challenges, for example, in the areas of paints and coatings, repair and maintenance, sensors and controls, and noise reduction.

Mr. Alex A. Beehler, Assistant Deputy Under Secretary of Defense for Environment, Safety and Occupational Health, noted that DoD is moving beyond compliance in the environmental field and cited the key role that SERDP and ESTCP play, as illustrated by the Project-of-the-Year Award topics. These topics included the detection, characterization, and wide area assessment of UXO; mapping invasive plant species; quantifying particulate matter emissions; bioremediation of chlorinated solvents; and developing alternative corrosion-protection coatings. Five SERDP and one ESTCP Project-of-the-Year Awards were presented to recognize research and technology developments that have helped DoD achieve its mission while improving its environmental performance. Recipients of this honor and a description of their projects follow.

SERDP Project of the Year—Cleanup. Chlorinated solvents are the single largest cost driver in the DoD groundwater cleanup program. Previous research investments have revealed that, while tetrachloroethene (PCE) and trichloroethene (TCE) are biodegradable, they often partially degrade to even more dangerous by-products. These by-products, cis-1,2-dichloroethene (*cis*-DCE) and vinyl chloride (VC), are known carcinogens and are widely found at DoD cleanup sites. **Dr. Frank Löffler** and his research team from the Georgia Institute of Technology explored the fate of *cis*-DCE and VC under different redox conditions and found that metabolic reductive dechlorination and aerobic energy-yielding oxidation were the dominant microbial processes that detoxify *cis*-DCE and VC. Researchers successfully isolated a previously unidentified bacterium—BAV1—that thrives on VC and completely degrades these target contaminants to ethene, an environmentally benign product. Cited as one of the 100 Top Science Stories of 2003 by the journal *Discover*, Dr. Löffler's research has

See SYMPOSIUM, page 4

Workshops Impact FY 2006 Solicitations, Prove To Be Invaluable Program Development Tool

With increasing frequency, SERDP and ESTCP actively are soliciting input from the scientific, engineering, and DoD user communities to identify needs for future research, development, test, and evaluation (RDT&E) through workshops. Each topical workshop (1) examines the current state of the science and engineering, (2) identifies the gaps in knowledge and technology, and (3) prioritizes those gaps where investments in RDT&E will have the greatest impact on DoD's ability to address its requirements. Workshop results then are incorporated into the Programs' strategic plan. In this way, SERDP and ESTCP can tailor their solicitations to seek innovative solutions to DoD's high-priority needs and better manage a holistic portfolio of projects responsive to these needs.

Two workshops held in 2004 that directly impacted the ongoing FY 2006 solicitations in SERDP and ESTCP are described below. As many as five workshops are in the planning stages for 2005. SERDP and ESTCP's strategic plan continually evolves by incorporating information from these workshops, other special studies, and completed projects.

Surface Coating and Decoating

Surface coating and decoating processes for the military alone generate nearly 450,000 pounds of volatile air emissions. Military vehicles, ships, and aircraft require an array of coatings for identification, camouflage, stealth, and corrosion protection. Every year the military uses tons of paints, paint strippers, sealants, and adhesives to maintain and repair coatings for weapons platforms. Until viable substitutes can be identified, using these materials requires expensive application, monitoring, and treatment processes.

In May 2004, SERDP sponsored a two-day workshop to develop a long-term investment strategy for surface coating and decoating. Nearly 70 invited attendees from 40 different organizations (federal and non-federal) identified research needs in Coatings Chemistry, Application Technologies, and Removal Technologies. Breakout groups were charged with (1) developing an understanding of the relevant pending federal, state, and local environmental regulations and their potential impact on DoD, (2) assessing the current state of the technology, (3) identifying the technology gaps to eliminate or minimize the associated environmental burdens, and (4) developing a framework for a long-term investment strategy.

The primary theme that emerged throughout the workshop was the need to eliminate or minimize hazardous material use and/or hazardous waste generated over the life cycle of the surface coating and decoating process. Other research needs identified include lower viscosity resins, improved adhesion properties, and increased high-solids materials. Achieving these and other research goals will support DoD's transition to a more efficient, environmentally benign coating and decoating system.

As a result of this workshop, SERDP released a Statement of Need (SON) on *Environmentally Benign Finishing/Coating Systems for DoD Substrates (PPSON-06-04)* during its FY 2006 Solicitation. The objective of this SON is to sponsor research leading to the development of chromate-free, zero volatile organic compound (VOC), zero hazardous air pollutant (HAP), and zero toxic release inventory (TRI) chemical finishing and coating systems for DoD applications. Successful development of such a system would address requirements for all Services.

Research focused on needs identified at SERDP's Coating and Decoating Workshop is expected to achieve new breakthroughs in coatings technologies—moving the DoD user community ever closer to the "ultimate coating system."

Contaminated Sediments

Aquatic sediments are often the ultimate receptors of contaminants in effluent from industrial as well as DoD activities. Sediment contamination problems are particularly difficult because contaminants tend to be retained within the sediments for a long time. Further complexities include the mixtures of contaminants often found at such sites, the different matrices in which these contaminants are found, the numerous physical compartments (e.g., sediment particles and sediment pore water) typical of such systems, and the highly complex processes governing contaminant exchange between system compartments and subsequent contaminant transport and fate. With more than 200 identified sites, the estimated cost to complete remediation of the Navy's contaminated aquatic sediments is more than $1 billion. As estuarine and coastal sites, in particular, fall under increasing scrutiny, the number of DoD sites requiring remedial action is likely to increase.

In August 2004, SERDP and ESTCP sponsored a two-day workshop to determine the RDT&E needs for the in situ management of contaminated aquatic sediments. Sixty experts, including researchers and engineers, from DoD, other federal and state agencies, academia, and the private sector participated in the workshop. Background papers prepared in advance of the workshop communicated the state of the science and engineering associated with key processes (sediment stability, fate and transport of contaminants, and characterization of contaminated sediments) and in situ

See WORKSHOP IMPACT, page 3

management approaches (capping; in situ treatment using physical, chemical, or biological processes; and monitored natural recovery [MNR]). These background papers combined with presentations at the workshop established a foundation for breakout group discussions charged with identifying and prioritizing gaps in knowledge and technology.

The findings of workshop participants are summarized in the following recommendations: (1) develop investigative tools to identify and predict the rates of the most important processes affecting contaminant fate, transport, and exposure; (2) improve analysis tools to determine the relationships and interactions among the processes, model the interactions of processes, and forecast the success of different remedial alternatives; (3) investigate the effectiveness of both active and passive sediment caps; (4) develop guidance for implementing MNR and documenting its performance; (5) overcome issues of in situ amendment delivery to cohesive sediment matrices; (6) establish standardized test sites for technology evaluations and comparisons; and (7) mine existing data. Workshop participants identified and prioritized nearly 80 specific RDT&E needs that are described in the Final Report, available in the SERDP and ESTCP Online Library at http://docs.serdp-estcp.org by entering *Sediments Workshop* under Search Phrase.

SERDP and ESTCP are seeking to address several of these high-priority RDT&E needs in the FY 2006 solicitations. In SERDP, SONs were released on the *Development and Placement of Amendments for In Situ Remediation of Contaminated Sediments (CUSON-06-02)* and the *Assessment and Measurement of Processes Impacting the Fate and Transport of Contaminants in Sediments (CUSON06-03)*. ESTCP released a Non-DoD Federal Agency and Broad Agency Announcement on *Remediation of Contaminated Sediments (Topic 4)*, seeking demonstrations of remediation technologies either in situ or for dredged sediments.

Advancing the state of the science and engineering of in situ management approaches for contaminated aquatic sediments has significant potential to positively impact future DoD cleanup actions. Expected results include more cost-effective remedial action plans that are protective of human health and the environment; improved reliability of site characterization efforts and contaminant treatment processes; and expedited cleanup/closure of DoD-contaminated sediment sites.

SERDP and ESTCP recognize the invaluable input by all workshop participants to identify high-priority needs for future RDT&E, a key element of the Programs' strategic plan to address DoD's environmental requirements. ◆

SERDP
Strategic Environmental Research and Development Program

Technical Symposium & Workshop:

Threatened, Endangered, and At-Risk Species on DoD and Adjacent Lands

ERDC

June 7-9, 2005

Wyndham Baltimore Inner Harbor Hotel

Baltimore, Maryland

SERDP and the U.S. Army Corps of Engineers Engineer Research and Development Center/Construction Engineering Research Laboratory/ (ERDC/CERL) are hosting a Technical Symposium & Workshop on research relevant to threatened, endangered, and at-risk species (TER-S). The purpose of this event is to highlight cutting edge research relevant to DoD TER-S and to identify research gaps that can be addressed, in part, by future SERDP Statements of Need.

Pre-registration will be available until May 23, 2005.

For additional information or to register for the Symposium & Workshop, go to www.serdp.org/tesworkshop or e-mail TESWorkshop@hgl.com.

led to the development of practical scientific tools for tracking BAV1 populations—a key requirement if bioremediation is to be an effective cleanup approach for chlorinated solvents.

SERDP Project of the Year–Pollution Prevention. **Dr. Glen Merfeld** of GE Global Research was honored for his research in the field of low-temperature powder coatings for heat-sensitive DoD substrates, including aircraft parts, weapon systems, and support equipment. As a replacement for solvent-borne coatings, this project developed a powder coating that can be applied to heat-sensitive materials without damaging them, while meeting all military performance specifications. Researchers investigated key coating ingredients, such as catalysts, corrosion inhibitors, flow-modifiers, and resins and then optimized the most promising formulations. The final formulation is built on a high-flow super-durable polyester resin, cross-linked with triglycidylisocyanurate and catalyzed with benzyltrimethylammonium bromide. The use of these powder coatings rather than solvent-borne coatings results in a 95% reduction in volatile organic compounds. Additional benefits associated with powder coatings include eliminating the costly paint application techniques and the costs of disposing of solvent-borne hazardous waste. By increasing the number of applications for which powder coatings can be used, this project will lead to substantial environmental and economic benefits for DoD.

SERDP Project of the Year–Compliance. The Project-of-the-Year Award for Compliance was presented jointly to **Dr. John Gillies** of the Desert Research Institute and **Dr. John Veranth** of the University of Utah for increasing the fundamental scientific understanding of dust generation and transport from DoD military vehicles on unpaved surfaces. This understanding is an essential first step to providing a more accurate and realistic assessment of DoD's impact on regional air quality, including improvements to the existing Environmental Protection Agency (EPA) method to estimate dust emission factors as well as cost-effective strategies to mitigate dust emissions from DoD activities. By quantifying dust emissions from wheeled military vehicles, Dr. Gillies' investigations led to the revision of previous conservative assumptions. Dr. Veranth's complementary work developed methods to track military vehicle and other fugitive dust sources. The successful studies conducted by these two researchers support the hypothesis that, while these specific DoD training activities may contribute to local particulate matter (PM) and visibility issues, they may not be a major source of regional dust on an annual average time scale. Rather, windy atmospheric conditions and the presence or absence of disturbed soils are primarily responsible for dust generation and transport on a regional basis. The new understanding gained by these projects will be used to develop strategies to mitigate dust emissions and help DoD maintain compliance with air quality regulations, while having a positive impact on military readiness.

SERDP Project of the Year–Conservation. **Dr. Susan Ustin** from the University of California, Davis was honored for her innovative research in measuring, mapping, and monitoring invasive plant species. Dr. Ustin and her research team successfully developed and integrated image processing and geographic information system (GIS) methods that mapped invasive weed species on DoD lands using hyperspectral remote sensing data. New support vector machine learning tools, such as the Hierarchical Foreground Background Analysis (HFBA), were used to characterize plant habitats and identify weeds through hyperspectral imaging. Researchers also developed modeling techniques to predict the probability of weed invasion and identify installations vulnerable to invasive weed species. They selected five bases from the Southeastern, Southwestern, and Northwestern regions of the United States, each with different weed types and patterns of environmental disturbance to demonstrate, refine, and validate the methodology. With these new tools, installation managers have a timely and cost-effective means to develop accurate maps of the distribution of invasive species and to better evaluate their invasive species control approaches. Initial estimates indicate that remote sensing surveys can dramatically increase the survey area—square miles versus acres—while reducing the associated costs by more than 90%.

SERDP Project of the Year–Unexploded Ordnance. **Dr. Frank Morrison** of the Lawrence Berkeley National Laboratory was recognized for his research to develop a systematic approach for the design and fabrication of an optimum active electromagnetic (EM) system for UXO detection and discrimination. Based on the methodology employed by the minerals exploration industry to search for metallic ore bodies, this project has developed an active EM system with a radically different design as compared to available sensors. From single location measurements, the active EM system can extract the best possible estimates of the location, size, shape, and metal content of a buried metallic object in the presence of an interfering response. The prototype sensor provides promising UXO detection and discrimination capability, which will result in substantially reduced field survey costs. The project has successfully transitioned the EM-based

See SYMPOSIUM, page 5

Innovative Software Tool to Improve UXO Detection and Discrimination

Unexploded ordnance (UXO) site characterization is often inefficient, expensive, and incomplete because of limitations of current technology and survey practices. Not all buried UXO are routinely detected, and UXO is not distinguished from other items in the ground that pose no risk. Over the past several years, SERDP and ESTCP have invested in developing data analysis and processing techniques for use with commercial geophysical sensors that can improve UXO detection as well as discrimination between UXO and site clutter. These techniques include estimating target features, such as ordnance size, shape, depth of burial, and orientation, from survey data. In addition, feature-based characterization and classification decision algorithms have improved discrimination performance in many demonstrations. However, historically, these feature-based algorithms have not been readily available to the user community and have had limited exposure to data acquired under constraints encountered in field surveys.

The primary objective of the ESTCP project *Feature-Based UXO Detection and Discrimination (UX-0210)* is to transfer anomaly characterization and classification algorithms to the user community by creating a *UXAnalyze* module for the Oasis montaj™ software program developed by Geosoft Incorporated. The project will demonstrate the efficacy of the feature-based approach in *UXAnalyze* through multiple demonstrations at sites with a variety of conditions and target objects. These demonstrations also will establish data quality requirements to support accurate feature extraction and advanced classification of buried objects.

The *UXAnalyze* software module consists of multiple databases, customized graphical interfaces, and data visualizations. This module provides the tools required to systematically identify and extract anomalies from the dataset, call the characterization routines, store the fitted source parameters for each anomaly, perform target classification, and document the analysis—all essential components of UXO site characterization. Once the analysis is complete, individual images for each anomaly can be produced automatically for documentation purposes.

To date, the project team from AETC Incorporated and Duke University has applied *UXAnalyze* on one controlled site and one field site. The first demonstration used *UXAnalyze* to examine and report results for magnetic and electromagnetic induction data acquired from an EM61 sensor at a controlled site on the Aberdeen Proving Ground Standardized Test Site. For the second demonstration, investigators are in the process of characterizing and classifying sensor data collected using an EM61 MKII sensor at Lake Success Business Park, a former Remington Arms facility in Bridgeport, Connecticut. The objective of this field site effort is to determine discrimination capabilities using data acquired in a moving survey mode. Additional demonstrations are planned over the next 2 years to critically evaluate the efficacy and benefits of *UXAnalyze* for various field conditions and target objectives.

Dissemination of feature-based decision algorithms via a *UXAnalyze* module for the Oasis montaj™ software program will improve UXO detection and discrimination.

The primary advantages of this software are improved detection of UXO by transitioning robust analysis of geophysical data to field use and advanced tools that can discriminate UXO from site clutter based on survey data. If successful discrimination capabilities can be achieved from routinely collected, high quality survey data, significant savings in excavation costs can be realized by leaving nonhazardous items unearthed. Transitioning *UXAnalyze* to the UXO community via Oasis montaj™ will improve UXO detection and reduce cleanup costs for the Department of Defense.

For more information about UXAnalyze, please contact Dr. Dean Keiswetter, AETC Incorporated, Cary, NC, at (919) 653-0215 or via e-mail at dkeiswetter@nc.aetc.com. ◆

SYMPOSIUM, from page 4

tools to ESTCP for full-scale demonstration and validation.

ESTCP Project of the Year. The ESTCP Project-of-the-Year Award was presented to **Dr. Herb Nelson** of the Naval Research Laboratory (NRL) and **Dr. Jim McDonald** of AETC Incorporated (formerly with NRL) for the successful demonstration of an airborne analog of the vehicular Multi-Sensor Towed Array Detection System (MTADS) for UXO detection and mapping. The Airborne MTADS will permit surveys of areas that are not conducive to vehicular towed arrays or that require large areas to be nonintrusively surveyed. Vehicular MTADS, originally developed under ESTCP, provided a reliable UXO surveillance system that typically surveys tens of acres per day. However, at this rate, it would take approximately 750 days at $400 to $800 per acre to survey a typical 15,000 acre range. The Airborne MTADS has demonstrated survey production rates up to 500 acres per day at an estimated cost of $100 per acre. Researchers conducted geophysical investigations on several ranges, including the Badlands Bombing Range in South Dakota, the Aberdeen Proving Ground in Maryland, and Isleta Pueblo in New Mexico, successfully demonstrating the Airborne MTADS to be an effective and reliable means for UXO detection and mapping. The most significant benefit of this effort will be the ability to conduct accurate wide-area digitally referenced geophysical surveys that permit large expanses of land to be declared free of UXO contamination.

See SYMPOSIUM, page 6

Program Development Update

SERDP

On November 10, 2004, the SERDP Solicitation for FY 2006 funds was released, and by the January 6 deadline, the Program Office received 206 pre-proposals in response to the Broad Agency Announcement that contained 18 Statements of Need. The SERDP staff has reviewed these pre-proposals and, on February 3, extended requests for full proposals to those that show promise and meet the relevance criterion. The full proposals from the private sector, along with proposals submitted in response to the federal Call for Proposals, were due to SERDP no later than March 10. Of the 191 full proposals received, 96 were from federal organizations, 29 from the private sector, and 66 from academic institutions. All full proposals will undergo an independent peer review evaluation, then be reviewed by the Technology Thrust Area Working Groups (TTAWG) during May and June.

In a parallel effort, SERDP released a **S**ERDP **E**xploratory **D**evelopment (SEED) solicitation with two Statements of Need on November 10. SEED efforts seek innovative and new environmental technologies that test proof-of-principle concepts during a one-year effort and cost less than $100,000. SEED proposals also were due March 10. A total of 60 SEED proposals, 22 from federal organizations, 13 from the private sector, and 25 from academic institutions, were received. These proposals will undergo staff review and be included in the proposal downselect meetings held by the TTAWGs in May and June.

An additional FY 2005 special SERDP solicitation was released on March 18, 2005, for the Defense Coastal/Estuarine Research Program (DCERP). SERDP seeks proposals focusing on research and technologies to design an extensive environmental monitoring system at Marine Corps Base Camp Lejeune and surrounding environs in east central North Carolina. The due date for all proposals is April 14, 2005.

For further details on the requirements and schedule for these solicitations, please refer to the SERDP web site (www.serdp.org) under the *Funding & Opportunities* link.

ESTCP

In response to the two FY 2005 ESTCP special solicitations released last fall, 41 pre-proposals were received for the Perchlorate solicitation and 23 pre-proposals for the UXO Wide Area Assessment solicitation. Both sets of pre-proposals were reviewed, and full proposals have been requested.

On January 6, ESTCP released both a FY 2006 Call for Proposals to non-DoD federal organizations and a Broad Agency Announcement for private sector submitters requesting pre-proposals. The Call solicited pre-proposals under four topics within the Unexploded Ordnance, Compliance, and Cleanup Pillars. All pre-proposals were due at the ESTCP Program Office by March 10. Also on January 6, an ESTCP Call for Proposals was sent to DoD organizations soliciting pre-proposals in the Cleanup, UXO, Compliance, and Pollution Prevention Pillars to be submitted by March 10. There were 84 pre-proposals received from non-DoD organizations, 5 from federal organizations, 65 from the private sector, and 14 from academic institutions. Seventy-three DoD pre-proposals were received. New this year, DoD, non-DoD, and private sector submitters will follow the same proposal review schedule. The ESTCP Review Committees will review all pre-proposals submitted and recommend which proposers should submit full proposals due by mid-August. For additional details on all ESTCP solicitations and the full proposal requirements, please refer to the ESTCP web site (www.estcp.org) under the *Opportunities* link. ◆

SYMPOSIUM, from page 5

At the conclusion of the Plenary Session, ESTCP Director **Dr. Jeffrey A. Marqusee** introduced the extensive technical program focused on 12 environmental topic areas and urged participants to expand their circles of collaboration throughout the conference. Topic areas encompassed UXO Detection, Range Sustainment, Sources and Alternatives to Perchlorate, Emissions from DoD Sources, Remediation of Dense Non-Aqueous Phase Liquids (DNAPL) and Emerging Contaminants, Military Coatings Life Cycle, and Preserving Critical Natural and Cultural Resources. The two technical exchange receptions showcased more than 250 posters and 17 exhibits, providing numerous opportunities for participants to interact with technical presenters and other attendees. Abstracts from the technical session and poster session presentations are available online.

For more information about the 2004 Partners in Environmental Technology Technical Symposium & Workshop as well as the Project-of-the-Year Awards, please refer to www.serdp.org under the Symposiums & Workshops link or www.estcp.org under the Related Events section of the Calendar/Events link. Information relevant to the next Symposium & Workshop, which will be held ***November 29–December 1, 2005,*** *at the Marriott Wardman Park Hotel in Washington, D.C., also will be posted on these sites.* ◆

PROGRAM NOTES

- **OUR THANKS TO ALL WHO PARTICIPATED IN THE PARTNERS IN ENVIRONMENTAL TECHNOLOGY TECHNICAL SYMPOSIUM & WORKSHOP IN NOVEMBER/DECEMBER**. The event was a tremendous success, thanks to your efforts. Plan to join us for the next Symposium & Workshop scheduled for November 29-December 1, 2005, at the Marriott Wardman Park Hotel, Washington, D.C.
- **THE COMBINED SERDP AND ESTCP IN-PROGRESS REVIEWS (IPR)** are being held in Arlington, Virginia, during March, April, and May. The schedule calls for the IPRs to be held on the following dates: Cleanup IPR (March 8-11 and May 16-20), Compliance IPR (April 4-7), Pollution Prevention IPR (April 18-22), UXO IPR (May 2-6), and Conservation IPR (May 10-12).

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- **QUARTERLY PROGRESS REPORTS** (i.e., the quarter's technical accomplishments, updated completion dates for milestones, and any concerns regarding technical/financial progress) for the second quarter of government FY 2005 are due by April 15, 2005. For assistance, SERDP Principal Investigators should contact their Program Manager Assistant.

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- **QUARTERLY PROGRESS REPORTS** (i.e., the quarter's technical accomplishments, updated completion dates for milestones and documents, and any concerns regarding technical/financial progress) for the second quarter of government FY 2005 are due April 15, 2005. For assistance, ESTCP Principal Investigators should contact their Program Manager Assistant.

S◆E◆R◆D◆P & E◆S◆T◆C◆P Online Library

- **NEW PUBLICATIONS ARE NOW AVAILABLE IN THE SERDP & ESTCP ONLINE LIBRARY** (http://docs.serdp-estcp.org). Conduct search by entering project number (e.g., 9920) under Search Phrase.

Cleanup

- *Protocol: Technical Protocol for Using Soluble Carbohydrates to Enhance Reductive Dechlorination of Chlorinated Aliphatic Hydrocarbons (ESTCP CU-9920)*

Pollution Prevention

- *Final Report: 120°C Cure, Durable, Corrosion Protection Powder Coatings for Temperature Sensitive Substrates (SERDP PP-1268)*

UXO

- *Cost & Performance Report: Combining Electromagnetic and Magnetometer Data Acquisition and Processing (ESTCP UX-0208)*
- *Final Report: Reducing False Alarms: The Physics of Scrap Discrimination for Magnetic Data (SERDP SEED UX-1356)*

PARTNERS IN ENVIRONMENTAL TECHNOLOGY

STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM (SERDP)

&

ENVIRONMENTAL SECURITY TECHNOLOGY CERTIFICATION PROGRAM (ESTCP)

INFORMATION BULLETIN

SPRING 2005 NUMBER 23

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C◆A◆L◆E◆N◆D◆A◆R

FOR SERDP AND ESTCP

APRIL 2005

April 4-7
Compliance In-Progress Review (IPR) meetings

April 18-22
Pollution Prevention In-Progress Review (IPR) meetings

MAY 2005

May 2-6
UXO In-Progress Review (IPR) meetings

May 10-12
Conservation In-Progress Review (IPR) meetings

May 16-20
Cleanup In-Progress Review (IPR) meetings (week 2 of 2)

RELATED CONFERENCES & EVENTS

April 11-14
2005 Joint Services Environmental Management Conference & Exhibition
Tampa, Florida

For more information, visit www.jsemconference.com/2005.

May 24-26
AIAA/AAAF Aircraft Noise and Emissions Reduction Symposium
Monterey, California

For more information, visit www.aiaa.org.

June 6-9
Eighth International In Situ and On-Site Bioremediation Symposium
Baltimore, Maryland

Sponsored by SERDP and ESTCP

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

June 7-9
Technical Symposium & Workshop on Threatened, Endangered, and At-Risk Species
Baltimore, Maryland

Sponsored by SERDP

For more information, visit www.serdp.org/tesworkshop.

June 12-16
American Water Works Association Annual Conference & Exposition
San Francisco, California

For more information, visit www.awwa.org/ace2005.

August 7-12
90th Annual Ecological Society of America (ESA) Meeting
Montreal, Canada

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

August 22-25
2nd DoD Sustainable Ranges Initiative
San Antonio, Texas

For more information, visit www.rangecon.org.

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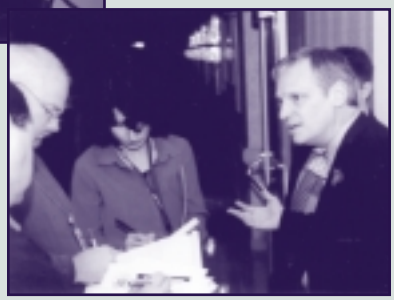


PLENARY SESSION

During the opening Plenary Session, the distinguished speakers encouraged participants to seek innovative approaches to address DoD's environmental challenges. Clockwise from top right: The Honorable Earl Blumenauer, from the 3rd Congressional District of Oregon; following his presentation, Congressman Blumenauer fielded questions from the media; Mr. Alex Beehler, Assistant Deputy Under Secretary of Defense for Environment, Safety and Occupational Health, commended the SERDP and ESTCP programs for their responsiveness to DoD needs; Mr. Beehler welcomed Brigadier General Willie Williams; Brigadier General Willie Williams, Assistant Deputy Commandant of Installations and Logistics (Facilities), U.S. Marine Corps; Ms. Janine Benyus discusses her book *Biomimicry: Innovation Inspired by Nature*; and Ms. Janine Benyus, renowned author and lecturer.

Partners in Environmental Technology Technical Symposium & Workshop

Marriott Wardman Park Hotel
Washington, D.C.
November 30–December 2, 2004

PROJECT-OF-THE-YEAR AWARDS

Above: ESTCP Director Dr. Jeffrey Marqusee (left) and SERDP Executive Director Mr. Bradley Smith (right) congratulated Dr. Frank Löffler for the SERDP Cleanup Award.

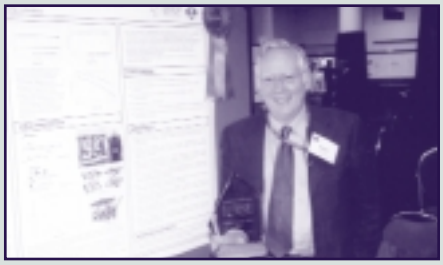
Below: Dr. Jim McDonald (second from left) and Dr. Herb Nelson (second from right) were recognized with the ESTCP Award.

Above: SERDP Pollution Prevention Award recipient Dr. Glen Merfeld (right) met with a colleague at the poster describing his award-winning research.

Below: Dr. Frank Morrison was honored with the SERDP Unexploded Ordnance Award.

Above: ESTCP Director Dr. Jeffrey Marqusee (left) and SERDP Executive Director Mr. Bradley Smith presented the SERDP Conservation Award to Dr. Susan Ustin.

Below: Dr. John Gillies (second from left) and Dr. John Veranth (second from right) shared the SERDP Compliance Award.



TECHNICAL SESSIONS

Stimulating presentations on 12 focused topical areas encouraged audience participation and follow-on discussion between acknowledged experts and the research and technology user communities.

SERDP
Strategic Environmental Research and Development Program

ESTCP

EXHIBIT HALL

During the Symposium & Workshop, attendees had many opportunities to tour the posters and exhibit booths while exchanging information and discussing technology transfer ideas.

PHOTOS BY CRAIG KELLSTROM