

FALL 2011

NESDI NEWS

Highlights & Happenings

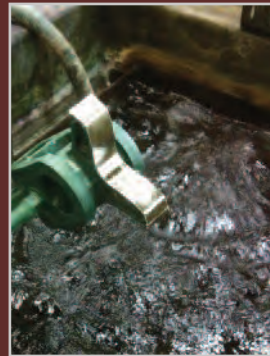


Welcome

This quarterly update provides a glimpse into program operations, significant accomplishments, and future focus areas for the Navy Environmental Sustainability Development to Integration (NESDI) program.

We hope you will find these insights useful and that they encourage you to participate (or increase your involvement) in the program over the coming months.

The NESDI Program: Integrating Green Technologies Into the Fleet





From the Program Manager's Desk



Welcome to the Fall 2011 issue of *NESDI News: Highlights & Happenings*—part of our ongoing effort to keep you informed about the NESDI program.

The next significant milestone on the NESDI program schedule is the collection of pre-proposals and full proposals to address the many needs we collected from our FY12 needs solicitation process. The NESDI program collected a total of 66 needs for FY12. After careful analysis and ranking, our management team (the Technology Development Working Group (TDWG)) recommended that 22 of those needs be forward to our resource sponsor (N45) for their review and approval. Of those 22 needs,

N45 personnel recommended that pre-proposals be requested for 19 of those needs. Those needs for which we will be requesting pre-proposals are as follows:

NO.	NEED	TITLE	EEC
1.	N-0795-12	Aircraft Wash Rack Oil/Water Separation	3
2.	N-0798-12	Vapor Intrusion Tool	5
3.	N-0799-12	Emerging Drinking Water Constituents of Concerns and Marginal Drinking Water Quality at Navy Bases	5
4.	N-0802-12	Demonstrate/Validate Alternatives to Methylene Chloride-based Chemical Paint Stripper	3
5.	N-0803-12	Portable Cold Spray Surface Metallization for Localized Repair of Cadmium and other Sacrificial Coatings	3
6.	N-0804-12	Initiation Decision Report on Coral Reef Transplantation Methods	5
7.	N-0808-12	Biofouling Mitigation for Permanent Oil Boom via Antifouling Elastomers	4
8.	N-0809-12	Small Arms Brass Collection on Ranges	2
9.	N-0814-12	Non-Hazardous Solid Waste Diversion	5
10.	N-0824-12	Air Emissions Guidance Tool	5
11.	N-0826-12	Non-explosive Venting of Full Scale Non-explosive Practice Munitions	2
12.	N-0827-12	The Effects of Copper on the Behavior of Estuarine Fishes for Effective Management of Sensitive Coastal Species	5
13.	N-0828-12	Improve Oily Water Treatment System Processes for Compliance with National Pollutant Discharge Elimination System Permit's Discharge Standards	5
14.	N-0829-12	Replacement of Film Radiography with Computed Radiography	3
15.	N-0834-12	Demonstrate/Validate Proposed MIL-P-85891 Type VIII Magic Media for Paint Removal of Aircraft Exteriors	3
16.	N-0835-12	Ship to Shore Waste Hazardous Materials Minimization—Supply Source Reduction	4
17.	N-0839-12	Request Review of Alternate Processes or Technologies to Aid in Reducing the Amount of Excess Paints that Becomes Waste	4
18.	N-0840-12	Environmental, Cost and Liability Reduction for Onsite Utilization of 'Transportable Field Melter' Shared Between Pine Castle and Fallon Bombing Ranges for Recycling of Bombing Range Material Potentially Presenting An Explosive Hazard	2
19.	N-849-12	Wind Turbine Interference with Ground Radar	2

In addition to these 19 needs, the TDWG will revisit yet more needs in the stormwater management area at a meeting to be held in January of next year. (For more insights into this meeting, see page 7 of this issue of *NESDI News*.) NESDI will also address other priority needs as they emerge during the course of the year like *Wind Turbine Interference With Ground Radar* (need N-0849-12 above)—the need for a method for determining an acceptable level of wind turbine interference with radar and navigation aids that allows for the development of multiple wind turbines and the continuation of the Navy’s mission.

Now it’s time for you to submit your own pre-proposal to address any of the needs we collected.

To submit a pre-proposal, visit the NESDI web site (at www.nesdi.navy.mil) and click on the “RDTE Pre-proposal Submissions Are Currently Being Accepted Through 18 November 2011” link at the top of the page. Once you begin the submission process, you will be able to identify the specific need that your pre-proposal seeks to address. You will also be able to view all of the essential details about a particular need.

For more information about submitting a pre-proposal, read the *Submitting and Evaluating Pre-proposals* reference guide available via our web site, contact your TDWG representative or read the “Using Our Web Site” section in this issue of *NESDI News*.

Leslie A. Karr

Leslie Karr, P.E.
NESDI Program Manager

New Projects

The NESDI program has just approved for funding the following 11 “new start” projects that will be initiated in FY12:

NO.	ID	TITLE
1.	465	Demonstration of Passive Samplers for Assessing Environmentally Realistic Concentrations of Munitions Constituents at Underwater Unexploded Ordnance (UXO) Sites
2.	471	Detection and Classification of Munitions and Explosives of Concern (MEC) in Shallow Highly Dynamic Underwater Environments
3.	470	Cyanide Waste Reduction of Electroplating and Stripping Process
4.	472	Lead-Free Electric Primers for Medium Caliber Ammunition (ESTCP leverage)
5.	475	Mobile Pier and Facility Waste Water Treatment System
6.	467	Methodology to Assess Essential Fish Habitat for Navy Coastal Properties
7.	466	Separation, Detection and Removal of MEC/UXO from Dredged Sediment Using Physical Separation
8.	468	Low Cost Selective Polymer and Laser Interferometer Real Time Sensors for Detection of Solvents in Contaminated Groundwater Plumes
9.	469	Validation of a Low Tech Storm Water Procedural Best Management Practice
10.	473	Dynamic Mixing Zone
11.	474	Toxicity Associated with Polyaromatic Hydrocarbons Used in Clay Targets

Who We Are

The NESDI program is the Navy’s environmental research and development demonstration and validation (6.4) program, sponsored by the Chief of Naval Operations Energy and Environmental Readiness Division (N45) and managed by the Naval Facilities Engineering Command.

The mission of the program is to provide solutions by demonstrating, validating and integrating innovative technologies, processes, materials, and filling knowledge gaps to minimize operational environmental risks, constraints and costs while ensuring Fleet readiness.





Integrating Technologies

Advanced Anodizing Technology Brings Multiple Benefits

For years, the Navy's Fleet Readiness Centers (FRC) have been anodizing aluminum aircraft parts to increase corrosion-resistance and durability. Anodizing is an electrochemical process, unique to aluminum, in which an oxide coating is formed on the surface of the metal. During the process, the aluminum part is immersed in an electrolyte and is positively charged using direct current from a rectifier (power source). Oxygen ions from the electrolyte move toward the anode (the aluminum component) and combine with aluminum ions to form a porous, protective layer of aluminum oxide. This coating is relatively porous and can be dyed in a variety of colors and/or sealed to further increase its corrosion-resistant properties.

Traditional methods of anodization involve manual operation/adjustments of the electric current, the use of lead cathodes, copper busbars to conduct electricity, and sulfuric acid as the

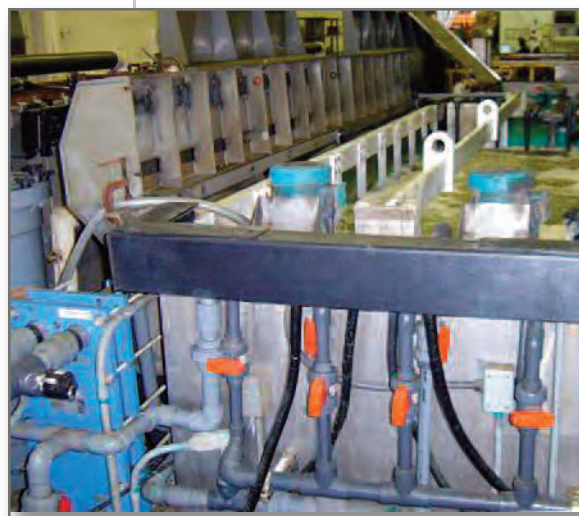
common electrolyte. These methods, while successful, have had their share of disadvantages when it comes to consistency and the efficiency in which the oxide is formed. Manual adjustments and control of current flow not only provides inconsistent and non-reproducible coatings, but could increase the risk of defects and rejects. This particularly becomes an issue when anodizing alloys rich in copper since these alloys are more prone to burning.

Lead cathodes, chosen for their corrosion-resistance, add to the problem due to their inefficiency to carry current thus requiring higher voltages to be used. Copper busbars contribute to unwanted contaminates in the bath. As the level of unwanted contaminates in the bath increases, the electrolyte must be disposed of more frequently to maintain proper bath chemistry. In addition, more than one process tank has typically been needed when anodizing more than one coating type.

Led by Ruben Prado, a NESDI project at FRC Southeast (FRCSE) in Jacksonville, FL has been demonstrating an improved methodology that takes advantage of commercial off-the-shelf solutions such as Metalast™ technology. Developed by Metalast International, Inc., this technology automates the process through the use of an Integrated Process Controller and an Interface Controller, and introduces a chemical additive for the bath chemistry, designed to reduce contaminant build-up, improve uniformity and eliminate burning. Also as part of this project, FRCSE has demonstrated the use of Trivalent Chrome Post Treatment as an alternative to hexavalent sealers on anodized aluminum alloys.

Optimizing the Anodizing Process.

This project successfully demonstrated and integrated technologies to optimize the application of anodized coatings to aircraft components and parts at the Fleet Readiness Centers in Jacksonville, FL and Cherry Point, NC.



Electrodeposition of Nanocrystalline Cobalt-Phosphorus Coatings as a Hard Chrome Alternative for Use in DoD Acquisition Programs

Electrolytic Hard Chromium plating (EHC) is a critical surface finishing technology that is used for applying functional coatings for corrosion and wear resistance to aircraft components in manufacturing operations and for re-build of worn or corroded components. This process is used extensively across Navy sites. However, EHC plating baths contain hexavalent chromium which is a known carcinogen and environmental hazard. Therefore, the replacement of EHC in aircraft manufacturing activities and maintenance depots is a high priority for the U.S. Department of Defense (DoD).



Finding an Alternative to Hard Chromium Coatings.

This project is demonstrating and validating nanocrystalline cobalt-phosphorus plating as an environmentally compliant alternative to hard chromium coatings.

Prado and his FRCSE colleagues are currently demonstrating and validating nanocrystalline cobalt-phosphorus plating (nCoP) as an environmentally compliant alternative to EHC coatings. As an electrodeposition process, nCoP is fully compatible with the existing EHC infrastructure, but exhibits higher cathodic efficiencies and deposition rates than EHC, thus yielding higher throughput, reduced facility footprint and reduced energy consumption. Further, nCoP offers significant performance enhancements over EHC including superior sliding wear, enhanced lubricity and corrosion resistance, and much improved fatigue properties.

nCoP was developed in participation with the DoD's Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP). An ESTCP project (WP-0936) along with leveraged support from the NESDI program (project #348) aims at fully qualifying nCoP through performance testing and demonstration/validation on a number of components from the Naval Air Systems Command (air vehicle and ground support equipment) and Naval Sea Systems Command (shipboard machinery components and ground support equipment).

For more information about these projects, contact Ruben Prado at ruben.prado@navy.mil. Ruben is profiled in this issue of *NESDI News*.

The NESDI program is always looking for demonstration sites for our ongoing projects and sites where we can implement our finished products. Contact the NESDI Program Manager or your TDWG representative if you think your installation might benefit from one of the NESDI program's demonstrated technologies.

Over the past few months, two NESDI Principal Investigators presented the results of their research at the **Advanced Surface Engineering Technologies for a Sustainable Defense (ASSETS Defense) conference that was held 30-31 August in Baltimore, MD.**

- Steve Brown's presentation on his project **"Navy Demonstration of Cadmium and Hexavalent Chromium Free Electrical Connectors" (project #451)** focused on the environmental tests he is conducting on Cadmium and Hexavalent Chromium-compliant electrical connectors.
- Ruben Prado also presented a briefing on **NESDI project #450 (Cadmium Tank Electroplating Alternative)** that outlined two objectives for this work:
 - Demonstration and validation of Alkaline Zinc-Nickel (DIPSOL IZ-C17+) as an alternative to tank cadmium electroplating on high strength steel/general surfaces within Depot-level maintenance.
 - Demonstration and validation of **Trivalent-Chromium (DIPSOL IZ-264)** as an alternative to conventional hexavalent post treatments on the above alkaline Zinc-Nickel deposits.

Both of these presentations and all other conference briefs are available on the ASSETS Defense web site at <http://www.asetdefense.org/Plating-Alternatives-2011.aspx>.

In addition, Steve Fann—the Principal Investigator on our **"Real-Time Drinking Water Quality Monitoring Technology Assures Water Safety" project (#356)**—gave a presentation entitled "Demonstration of Online Sensors to Protect and Optimize Military Water Distribution Systems: Case Study" at the Integrated Water Security Summit Dedicated to Defense-In-Depth: Innovation and Technology Implementation held in San Francisco, CA on 3-4 November.



Names & Faces: **NESDI Profiles**

In this issue of *NESDI News*, we are profiling Ruben Prado—the Principal Investigator for our efforts to demonstrate and validate advanced anodizing technologies.



Ruben Prado



Organization

Naval Air Systems Command
Jacksonville, FL

Education

- B.S., Chemistry, University of Central Florida
- Certified Electroplater-Finisher from the American Electroplaters and Surface Finishing Society
- NAVAIR Associate Fellow

Experience

I have dedicated 24 years of professional service to the Department of Defense (DoD) which includes eight years with the Air Force at Kelly Air Force Base as an Industrial Chemist and 16 years with NAVAIR (at the In-Service Support Center Jacksonville) as a Process Control Chemist and subject matter expert in inorganic protective coatings for corrosion/wear applications. My line of work includes research and development, test and evaluation (RDT&E) related to the development and integration of environmentally friendly and improved surface finishing technologies in support of repair and overhaul operations at Navy facilities.

Role

My work with NESDI began as a Principal Investigator on the development of advanced anodizing using Process Control Technology and Hexavalent Chromium-free post sealing for improved corrosion and wear performance on aluminum alloys (project #330). This project resulted in two NAVAIR authorization letters and implementation across the Navy's FRCs. I am currently the Principal Investigator who is managing the development of a new electroplating technology utilizing Nanocrystalline Cobalt-Phosphorous alloy deposits as an alternative for engineering hard chrome.

Connections

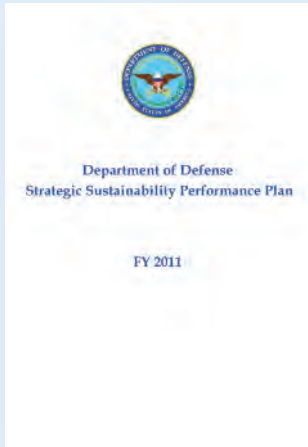
I am regularly consulted by the technical community at all NAVAIR sites, Naval Surface Warfare Center sites, Office of Naval Research, and support program offices throughout the acquisition lifecycle. My involvement with RDT&E and technology development sponsors such as SERDP, ESTCP and NESDI has led to increased collaboration across other DoD agencies and industry on new coating technologies.

Perspective

The NESDI program has been very supportive of my efforts as one of its Principal Investigators and is a valuable asset for promoting sound pollution prevention initiatives and the implementation of new technologies.

For more information about Ruben's projects or his role in the NESDI program, you can contact Ruben at 904-790-6381 and ruben.prado@navy.mil.

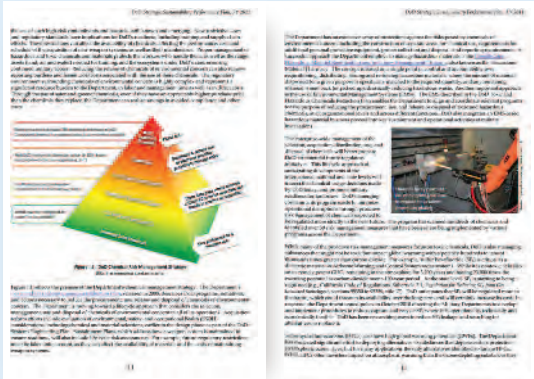
DoD Releases Strategic Sustainability Performance Plan



On 31 October 2011, the Department of Defense (DoD) and other Federal agencies released their second annual Strategic Sustainability Performance Plans. Under Executive Order 13514, Federal agencies are required to develop, implement and annually update a plan that prioritizes actions based on a positive return on investment for the American taxpayer and to meet greenhouse gas (GHG) emission, energy, water, and waste reduction targets.

In 2011 and 2012, DoD's primary sustainability focus will be to reduce the Department's reliance on fossil fuels through energy efficiency and renewable energy, and to continue making the institutional improvements needed to incorporate sustainability into DoD doctrine, policies, budgets, and action. Since the vast majority of DOD's GHG emissions result from the burning of fossil fuels, these energy efforts should also assist in reaching DoD's GHG emission reduction targets.

One of the NESDI program's projects—**Sustainable Naval Facilities (#252)**—identified software to help Navy building and energy managers reach the DoD and Navy sustainability goals. This NESDI project identified and evaluated a web based assessment tool—the Portfolio Manager developed by the U.S. Environmental Protection Agency—that Navy personnel can use to reduce the environmental impact of the Navy's existing facilities through the use of sustainable practices, policies, and technologies.



The Naval Facilities Engineering Service Center provides a free Weekly Federal Regulatory Summary that DoD personnel or contractors supporting DoD may receive by e-mail. To subscribe or unsubscribe, contact NFESRegulatorySupportDesk@navy.mil or 805-982-2640.

The DoD plan is available at http://www.denix.osd.mil/sustainability/upload/DoD-SSPP-FY11-FINAL_Oct11.pdf. All Federal agency plans are available at <http://sustainability.performance.gov/>.

NESDI Program to Hold January 2012 Meeting to Address Stormwater Management Issues

In an effort to begin to address the emerging requirements associated with the ongoing challenges of effectively managing stormwater at Navy facilities, the NESDI program is convening a meeting of stormwater users, researchers and policymakers to be held in San Diego on 10-11 January 2012. For insights into the results of the discussions held during this meeting, read the winter-12 issue of *NESDI News*.



PROGRAM SCHEDULE

In this section of *NESDI News*, we provide insights into our annual program schedule. For the next few months, the program will concentrate its efforts on collecting and evaluating the pre-proposals and full proposals from its customer base. Check our web site for the latest version of our program schedule.

NO.	WHAT	WHEN
1.	Request Pre-proposals	17 October 2011
2.	Close Pre-proposal Collection	18 November 2011
3.	Collect TDWG Comments on Pre-proposals	29 November 2011
4.	Evaluate Pre-proposals	29 November – 1 December 2011
5.	Request Full Proposals	12 December 2011
6.	Collect Full Proposals	20 February 2012
7.	Collect Functional Working Group Comments on Full Proposals	9 March 2012
8.	Collect TDWG Comments on Full Proposals	21 March 2012
9.	Screen Full Proposals	26-30 March 2012
10.	Evaluate Full Proposals	18-22 June 2012
11.	Obtain Sponsor Review & Approval of Full Proposals	9-23 July 2012
12.	Conduct In-Progress Reviews	West: 7-11 May 2012 East: 18-22 June 2012 Stormwater: 10-11 January 2012
13.	Announce New Starts	30 July 2012
14.	Quarterly Status Reports Due (all Fridays)	14 October 2011 13 January 2012 13 April 2012 13 July 2012
15.	Conduct N45 Programmatic Review	6 October 2011 19 January 2012
16.	Announce FY13 Needs Solicitation	01 June 2012
17.	Close FY13 Needs Solicitation	01 August 2012
18.	Screen Needs	13-17 August 2012
19.	Evaluate & Rank Needs	10-14 September 2012
20.	Obtain Sponsor Review & Approval of Needs	24 September – 5 October 2012

USING OUR WEB SITE

To submit your own pre-proposal, click on the “RDTE Pre-proposal Submissions Are Currently Being Accepted Through 18 November 2011” link from the home page on the NESDI web site. Once you read about submitting a pre-proposal, click on the “Submit a Pre-proposal Now” button to be taken to another page where you can complete your submission.

Use this on-line form to tell us everything you can about your proposal. Then use “Spell Check” to correct any typos and click on the “Submit” button to complete the process.

A pre-proposal submission is the initial step in describing how a proposed technology successfully addresses the environmental need it targets. The NESDI program concentrates on technologies that are sufficiently mature for demonstration and validation and support the overall environmental readiness of the Fleet and Navy acquisition communities. Pre-proposals are required to be submitted via a web form. To facilitate the web submission process, a template is available. Your pre-proposal should:

1. Focus on and describe how it will address the need being targeted
2. Clearly explain the project objectives
3. Quantify and qualify the technical criteria for a successful project
4. Identify the environmental constraint(s) to be resolved

5. Include the basic strategy for successfully integrating the solution into the Fleet
6. Identify the authorization stakeholders related to the proposed effort

Once pre-proposals have been collected, NESDI program management reviews and ranks them using established criteria. This is followed by a final evaluation that determines which pre-proposals will proceed to full proposal development. The results are provided to anyone who submitted a pre-proposal shortly after the evaluation period ends on 29 November 2011.

The call for full proposals will run from 12 December 2011 until 20 February 2012. (Full proposals are solicited by invitation only.)

The screenshot shows the NESDI website homepage. At the top, there are logos for NAVFAC (Naval Facilities Engineering Command) and NESDI (Navy Environmental Sustainability Development to Integration Program). The main heading is "Navy Environmental Sustainability Development to Integration Program". Below this, there is a navigation menu with links like Home, Program Details, Current Projects, etc. A central banner reads "RDTE Pre-proposal Submissions Are Currently Being Accepted Through 18 November 2011". Below this, there is an "About the Program" section, a "Program Mission" section with a list of two points, and a "Contact Us" section. The page also includes a "Click Photos For Details" section on the right with three images: a close-up of a ship's hull, a ship's deck, and an underwater scene.

For more information, download our *Reference Guide: Submitting and Evaluating Pre-proposals* from the NESDI web site. Direct any questions about the use of our web site to Eric Rasmussen, our webmaster, at 732-323-7481 and eric.rasmussen@navy.mil.



NESDI NEWS

FALL 2011

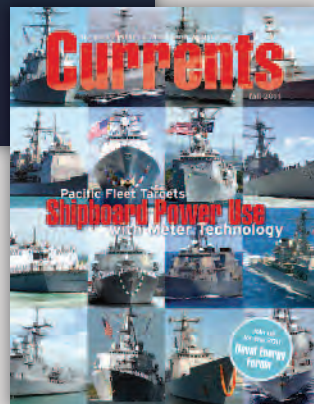
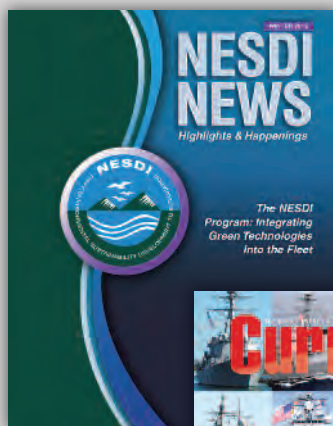
GETTING ON OUR MAILING LIST

If you're not already on our mailing list and want to subscribe, please contact Lorraine Wass at 207-384-5249 or ljwass@surfbest.net and we'll add you to our distribution.

CONTACT US

For more information about the operation of the NESDI program, contact Leslie Karr, the program manager, or members of the TDWG—the program's management team.

No.	Name	Command	Email
1.	Karr, Leslie (Chair)	NAVFAC	leslie.karr@navy.mil
2.	Cahoon, Lynn	NAVAIR	albert.cahoon@navy.mil
3.	Curtis, Stacey	SPAWAR	stacey.curtis@navy.mil
4.	Hall, Chaela	CNIC	chaela.hall@navy.mil
5.	Heath, Jeff	NAVFAC	jeff.heath@navy.mil
6.	Hertel, Bill	NAVSEA	william.hertel@navy.mil
7.	McCaffrey, Bruce	Consultant	brucemccaffrey@sbcglobal.net
8.	McVey, Tami	CNIC	tami.mcvey2@navy.mil
9.	Olen, Jerry	SPAWAR	jerry.olen@navy.mil
10.	Paraskevas, Nick	NAVAIR	nicholas.paraskevas@navy.mil
11.	Rasmussen, Eric	NAVAIR	eric.rasmussen@navy.mil
12.	Sugiyama, Barbara	NAVFAC	barbara.sugiyama@navy.mil
13.	Webber, Cindy	NAVAIR	cynthia.webber@navy.mil



IN THE NEXT ISSUE OF NESDI NEWS

There is a lot more information coming your way in the next issue of *NESDI News: Highlights & Happenings*. In our Winter-12 issue we will:

1. Provide you with insights into the results of our pre-proposal collection.
2. Tell you how to follow-up a pre-proposal with a full proposal.
3. Give you insights into the results of the meeting of stormwater experts that convened in January 2012.

Until then, look for an article about the results of some of our research entitled **“Zero-Valent Zinc Shows Promise for Removing TCP from Groundwater: Studies Show Positive Results Removing Recalcitrant Compound from Pendleton Well”** in an upcoming issue of *Currents*—the Navy's energy and environmental magazine. Read *Currents* on-line and subscribe to the magazine at <http://greenfleet.dodlive.mil/currents-magazine>.