

SPRING 2014

NESDI NEWS

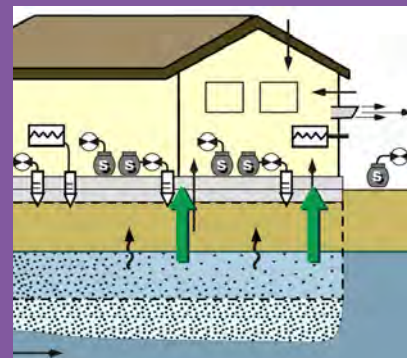
Highlights & Happenings



Welcome

This quarterly update provides you with the latest information about 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





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 (OPNAV N45) and managed by the Naval Facilities Engineering Command (NAVFAC) from the Engineering and Expeditionary Warfare Center in Port Hueneme, CA.

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



From the Program Manager's Desk



Leslie Karr, P.E.
NESDI Program Manager

Welcome to the spring 2014 issue of *NESDI News: Highlights & Happenings*—part of our ongoing effort to keep you up-to-date about the NESDI program. This quarterly update provides you with the latest information about program operations, significant accomplishments, and our future focus areas. I hope these insights encourage you to participate in the program over the coming months.

In this issue of *NESDI News*, we must say goodbye to another of our Principal Investigators—Scott Hermon. Scott managed a number of projects during his tenure with the NESDI program including an evaluation of a web site developed by the U.S. Environmental Protection Agency (EPA) that addresses environmentally sustainable practices and identifies an integration strategy for implementing a sustainable process in existing Navy-owned facilities. Scott's most recent effort was on our *Low Impact Development (LID) for Industrial Areas* project (#493) where he was in the process of identifying, evaluating, and providing guidance on LID practices capable of removing pollutants and volume reduction from stormwater runoff in industrial areas. We thank Scott for his efforts and wish him well on his new assignment with the Army in Vicenza, Italy.

While Scott Hermon is preparing for his next assignment, Ignacio Rivera-Duarte from the Space and Naval Warfare Systems Command has been making some great progress on a number of NESDI-sponsored projects. Ignacio is profiled and his projects are highlighted in this issue of *NESDI News*.

I'd also like to welcome Christine Porter (from Commander, Navy Installations Command) and Bill Venable (from the Naval Facilities Engineering and Expeditionary Warfare Center) to the Technology Development Working Group (TDWG). They have already provided some valuable insights since joining the team over the past few weeks.

For the past several weeks, the TDWG and I have been screening the full proposals that we received to address the priority needs we collected during our Fiscal Year (FY) 2014 needs solicitation. More information about the results of our full proposal screening as well as a schedule for our remaining 2014 In-Progress Review (IPR) are also provided in this issue.

Leslie Karr



News from the Field

The NESDI program recently received two bits of good news from the field.

Range Manager Endorses Use of Bomb Venting Drills

For our *Innovative Drilling Process to Vent Full Scale Non-Explosive Practice Munitions* (project #482), Arthur “Lee” Shults, our end user and the Operational Range Clearance program manager at the Pinecastle Range Complex heartily endorsed the results of this NESDI project led by Joey Trotsky. Shults said, “The bomb drills are outstanding. Once properly inspected by qualified personnel, we are able to vent full scale inert practice bombs without using Comp C-4 explosives. In fact, the majority of the bombs staged at the Ordnance Demilitarization Site may need to be vented using the bomb drills demonstrated by the NESDI program. The drills are a welcome addition to our Material Potentially Presenting an Explosive Hazard processing tool box and have enhanced our ability to vent and expose internal fillers for verification. And we are even discussing the use of these drills at other Navy ranges.”

NoFoam Technology Has a New User

One of the NESDI program’s vintage projects, *NoFoam System for Aircraft Hangar Fire Suppression Foam System Discharge Checks* (project #240), has a new user. In February of this year, Kaare Holm (from Emerging Growth Enterprise and a NoFoam system licensee) along with Rance Kudo and the Engineering and Expeditionary Warfare Center’s NoFoam team successfully delivered a long awaited NoFoam system for use by personnel at the Army National Guard Joint Base Lewis-McChord (JBLM) in Washington State. After much effort, the NoFoam team overcame many obstacles regarding the planning, engineering, bidding, installation, and testing of the system, working hand-in-hand with Patriot Fire Protection of Tacoma, WA—the contractor for the aircraft hangar fire suppression foam system upgrades. JBLM now has a newly-installed NoFoam system that will eliminate the generation and disposal of aqueous film-forming foam wastewater associated with the biennial testing of aircraft hangar fire suppression foam system.



Final Reports & Guidance Documents Abound

Since the publication of the winter 2014 of *NESDI News*, many of our Principal Investigators have been busy finishing up their work on the final reports and guidance documents associated with their NESDI projects. The following highlights the progress made on a number of such NESDI projects:

1. Joey Trotsky drafted a technical report for his efforts on NESDI project #483, *Transportable Field Melter for Recycling of Bombing Range Material Potentially Presenting an Explosive Hazard*.
2. Joe Trotsky also wrote a final report for his NESDI project #445, *Demonstration of Lime Application at Navy Open Detonation Sites*.
3. Jill Hamilton generated a guidance document entitled "Improving Non-Hazardous Solid Waste Diversion, Food Waste (NESDI #478)" as part of her NESDI project of the same name. (The document for Jill's report is UG-NAVFAC-EXWC-EV-1403.)
4. Brandon Swope published his final report "Nylon Sonobuoy Parachutes: Applications and Environmental Considerations" upon the completion of his NESDI project *Environmental Effects of Military Expendable Material* (#462).
5. Suzanne Graham and Jessica Bredvik produced a draft of the final report for their NESDI project *Methodology to Assess Essential Fish Habitat for Navy Coastal Properties* (#467).
6. Ignacio Rivera-Duarte wrote a final report for his work on NESDI project *RAPID RESPONSE: Automated Long-Term Monitoring System for Natural Resource Management* (#477).
7. Edwin Chiang wrote a reference guide as part of his *Successful Municipal Separate Storm Sewer System Programs Implemented in the Navy* project (#494).
8. Andy Schwartz produced a final report for his NESDI project *Non-Chromated Post Treatments* (#328).

These reports and guidance documents will be made available via the NESDI web site (www.nesdi.navy.mil).



Names & Faces: NESDI Profiles

In this issue of *NESDI News*, we profile Ignacio Rivera-Duarte — the Principal Investigator on a number of our projects including our *Capacitive Deionization Water Treatment System* project (#492), *Automated Long-Term Monitoring System for Natural Resource Management* project (#477), and *Improved Assessment Strategies for Vapor Intrusion* project (#424) as well as an effort to document clean sampling techniques.



Ignacio Rivera-Duarte

Organization

Space and Naval Warfare Systems
Command, Systems Center Pacific

Education

- Ph.D., Geochemistry
University of California,
Santa Cruz (UCSC)
- M.S., Analytical Chemistry
University of the Pacific
- B.S., Oceanography
Autonomous University
of Baja California

Experience

I have 30 years of environmental research experience—seven of which were in graduate or postgraduate positions at UCSC. It was at UCSC where I was introduced to trace metal clean techniques for quantification and size-speciation of metals in the aquatic environment. I was responsible for following clean techniques for sampling and analysis of metals in surface waters for the San Francisco Bay Monitoring Program. Most of my research at SSC Pacific has been based on the use of trace metal clean techniques. Research topics covered during my professional experience include characterization of coastal waters under pristine and contaminated conditions, detection of dissolved metals in slurries, application of trace metal techniques for sampling and analysis of environmental samples, quantification and size-speciation of metals in the aquatic environment, bioavailability and toxicity of metals, and assessment of vapor intrusion.

Role

My primary role has been as a researcher and Principal Investigator on three NESDI projects: *Capacitive Deionization Water Treatment System* (project #492); *Automated Long-Term Monitoring System for Natural Resource Management* (project #477); and *Improved Assessment Strategies for Vapor Intrusion* (project #424). During my work on project #492, I demonstrated a system for the treatment of drinking water in forward operating bases and other locations with minimal infrastructure. I assessed the feasibility of a commercial system for monitoring coastal waters under project #477. For project #424, I developed and documented approaches for assessing vapor intrusion at buildings on Department of Defense (DoD) installations. I am leading a NESDI “quick response” effort on clean sampling techniques that explores the use of these applications for improving regulatory compliance, mainly related to National Pollutant Discharge Elimination

System (NPDES) permits.

I have also served as the Principal Investigator for a project sponsored by the Environmental Security Technology Certification Program (ESTCP), *Total Copper Analyzer for Rapid In Situ Characterization of Effluent Discharges* (#200311) which validated the use of a Total Copper Analyzer (TCA) for the continuous measurement of total recoverable copper in industrial situations at full-scale. I was on the team for Strategic Environmental Research and Development Program project CP-1156, *"Fate and Ecological Effects of Copper and Zinc in Estuarine Environments: A Multi-Disciplinary Program,"* and ESTCP ER-0523 *"Demonstration of an Integrated Compliance Model for Predicting Copper Fate and Effects in DoD Harbors"* which resulted in a marine Biotic Ligand Model currently under revision for approval by EPA for regulation of marine waters. In addition to NESDI project #424, I collaborated on an ESTCP project, *Use of*

On-Site Gas Chromatography/Mass Spectrometer Analysis to Distinguish Between Vapor Intrusion and Indoor Sources of VOCs (ER-201119), and NESDI project #476, *A Quantitative Decision Framework for Assessing Navy Vapor Intrusion Sites*, on assessment approaches for vapor intrusion. The disparity among these projects is an example of the diversity of my research interests.

Connections

My main source of connections for the NESDI program relates to the quantification of metals and bioavailability at levels relevant to the environment. Here at SSC Pacific, we have capabilities that include clean working rooms and benches, an Inductively Coupled Plasma-Mass Spectrometer, which combined with our toxicology and installations for antifouling coatings assessment, allow us to work at the trace levels required for regulatory purposes. Publication of our work in peer-review scientific journals as well as in technical reports, and support provided to end users,



Ignacio Rivera-Duarte conducting field sampling at Pearl Harbor.

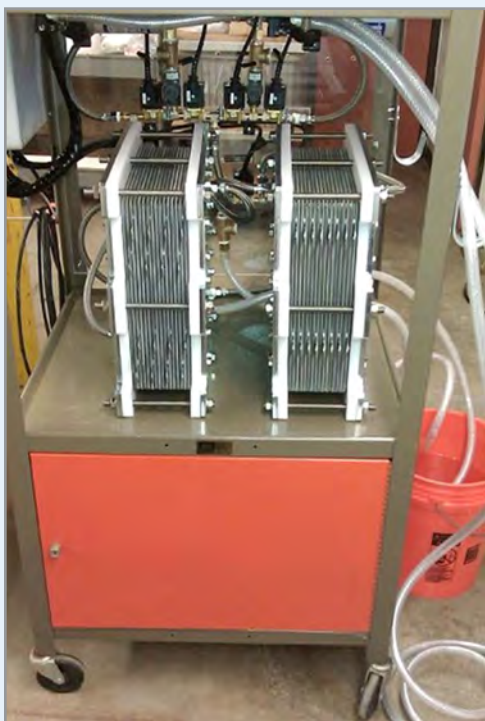
has resulted in Navy end users (mainly shipyards) requesting more support to address their regulatory needs. These services also generated information on environmental technologies that often require the support from NESDI for final development and demonstration.

Perspective

My line of research aligns very well with some of NESDI's interests. Part of my work is assessing the effects of Navy's shoreline industrial activities on the adjacent body of water. Some of my research is on real time assessment of environmental parameters, on the assessment of leaching of contaminants from antifouling paints, and on the assessment of vapor intrusion. These all are areas that the NESDI program

New Water Treatment and Long-Term Monitoring Systems, Vapor Intrusion Assessment Strategies & Clean Sampling Techniques

For the past several years, Ignacio Rivera-Duarte from SSC Pacific, has led three innovative projects for the NESDI program including an effort to demonstrate a low cost alternative to reverse osmosis water treatment, an automated long-term monitoring system for natural resource management, and improved assessment strategies for vapor intrusion.



A tandem CDI system optimizes water treatment, energy storage and reuse.

Capacitive Deionization Water Treatment System (Project #492)

This effort is challenge-testing and improving upon the application of Capacitive Deionization (CDI) for the treatment of drinking water at small facilities without significant infrastructure, maintenance expenditures, and with minimal or negligible hazardous material handling. CDI is an electrochemical water treatment method that will work with near energy-neutral requirements, releasing small amounts of brine, and will not require chemical cleaning. Because it utilizes an alternative media type—carbon sheets—there is no media change-out needed. The system will be challenge-tested against a similarly rated reverse osmosis system for its ability to remove contaminants, and will be stress-tested for durability. The CDI system is expected to perform comparably to a reverse osmosis system at significantly less cost. Information from this effort will be used to size-scale a CDI treatment system to accommodate different volumes of treated drinking water.

Automated Long-Term Monitoring System for Natural Resource Management (Project #477)

This project demonstrated the deployment of an automatic system for long-term, onsite monitoring of environmental parameters in support of natural resource management. The probe and telemetry system, called the Aqua Buoy from In-Situ, Inc. is deployable in coastal areas such as bays and protected coastal areas for long-term, on-site monitoring of environmental parameters, including temperature, salinity, pH and dissolved oxygen. The proposed monitoring system will supply critical information



The Aqua Buoy shown before deployment.



The Aqua Buoy after five months of deployment.

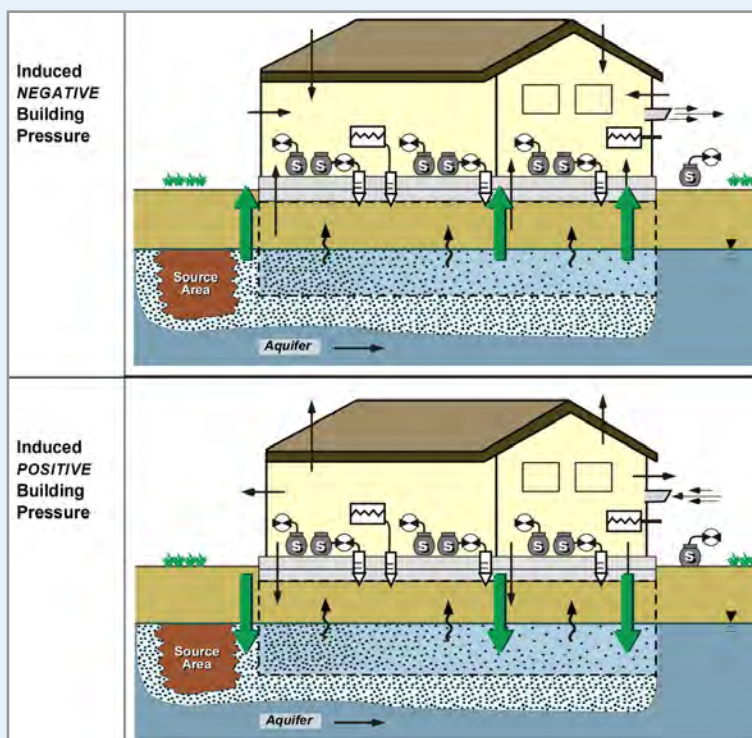
for development of Integrated Natural Resource Management Plans, National Environmental Policy Act documentation and other base compliance measures, as well as for the evaluation of management strategies and military construction investments.



Close up of a dissolved oxygen sensor covered by algae.

The use of automated environmental field sensors and monitoring systems can decrease the dependence on laboratory, field, or at-sea monitoring procedures, and will enhance the capabilities for range sustainment by maximizing training and testing requirements within environmental constraints.

The project's user guide and final report are soon to be available via the NESDI web site (www.nesdi.navy.mil).



How pressure cycling works.

Improved Assessment Strategies for Vapor Intrusion (Project #424)

When chemical vapors from contaminated soils infiltrate a building, the resulting phenomenon is known as vapor intrusion. The objectives of this project were to identify, evaluate, select and demonstrate promising methodologies for the assessment of exposure associated with the VI pathway, and to make those methodologies available to the Department of Defense and the public.

Based on feedback from Navy users, the team identified three critical technologies, including:

1. Using pressure cycling for differentiation between background levels and vapor intrusion

2. Using quantitative passive samplers for measurement of long-term average indoor air concentrations more representative of health exposures
3. Using portable analytical systems for the identification of indoor areas of greatest concern

Two of these technologies, pressure cycling and passive samplers, were successfully demonstrated. To facilitate transfer to the user community, the demonstration of pressure cycling was concurrently verified by EPA's Environmental Technology Verification program. A demonstration of portable analytical systems has been accepted for funding by the Environmental Security Technology Certification Program.

The validated technologies, techniques and services have been published in Technical Report 1982 (TR 1982). The report is available to the public at www.spawar.navy.mil/sti/publications/pubs/tr/1982/tr1982cond.pdf.



FY14 Full Proposals Under Review

The program collected a total of 22 pre-proposals to address the priority needs that resulted from our FY14 solicitation process. The next significant milestone on the NESDI program schedule is the submission and review of full proposals. Once all pre-proposals were collected, NESDI program management reviewed and ranked them using established criteria including how the proposed effort addresses the need, how executable the project is, if the proposed effort is ready for demonstration and validation, and how feasible it will be to integrate the solution into ongoing Fleet operations. This was followed by a final evaluation that determines which pre-proposals will proceed to full proposal development. These results were provided to anyone who submitted a pre-proposal shortly after the evaluation period ended on 22 November 2013.

Full proposals were requested for those pre-proposals that did the best job of meeting the evaluation criteria and addressing the explicit requirements stated in the targeted need.

Of the pre-proposals that were received, full proposals were requested for the following pre-proposals:

No.	Full Proposal ID	Submitter	Submitter Command	Title
1.	132	James Howell	NAVSEA	Equipment and Process for More Effective Flushing of Potable Water Distribution Lines to Maintain Chlorine Residual Levels
2.	135	Scott Hermon	NAVFAC	Zero Discharge Inline Hydrostatic Flushing
3.	133	Eric Friedl	NAVFAC	Enterprise NAVFAC Hazardous Waste Application
4.	134	Gene Griffin	NAVFAC	Leaking Thermosetting Elastomer Bomb Sealant in General Purpose Bombs
5.	126	John Rettig	NAVAIR	Investigation of Improved Epi-seal Materials for Use in General Purpose Bombs
6.	129	Bart Chadwick	SPAWAR	Long-Term Integrated Sediment Management Strategy to Ensure Resiliency of Mission Critical Infrastructure
7.	136	Christopher Scott Lynn Tawney	Other	Multi-Sensor Weapons Impact Detection and Location System
8.	137	Daniel Grady	SPAWAR	Radiant Ship Cooling
9.	125	Sonny Maga	NAVFAC	Design Closed-Loop Cooling Water System to Accommodate Ship Cooling Water Needs
10.	124	Peter Sheridan	NAVAIR	Enhanced Trivalent Chromium Pretreatment for Improved Coloration and Corrosion Performance of Aluminum Substrates
11.	127	Kara Sorensen	SPAWAR	Demonstration of an Improved Method for Quantifying Algal Biomass to Meet Nutrient Numeric Endpoint Compliance
12.	128	Rachel Jacobs	NAVSEA	Pierside In-situ Discharge Monitoring for Collection and Hold Tank Contaminants
13.	130	Patricia Venable	NAVFAC	Assessment of Indoor Air Volatile Organic Compound Temporal Variability and Influences of Building Characteristics for Navy Industrial Buildings Affected by Vapor Intrusion
14.	131	Steve Hammett	NAVFAC	Underwater Remotely Operated Vehicle Mounted Ultra-High Pressure Waterjet Cutter Tool for Underwater Munitions Breaching
15.	N/A	Tracey Harasti Patrick Morrow	NAVSEA	Develop an Automated Real-Time Opacity Monitor for Use in Determining the Opacity of Fugitive Emissions in lieu of EPA Method 9

Successful proposals will result in new projects beginning in FY15 and beyond.



Submit Your Photo! Recommend Your Site!

We are always looking for some good pictures of our project demonstrations in progress. Or do you have another site for us to consider for one of our ongoing projects?

So whether you've got a great picture to share or a new demonstration site to propose, let us know. Your picture, your site or both may end up in a future issue of *NESDI News*.

Using Our Web Site



www.nesdi.navy.mil

Direct any questions about submitting a pre-proposal or any other function of our web site (www.nesdi.navy.mil) to our webmaster Eric Rasmussen at 732-323-7481 or eric.rasmussen@navy.mil.

www.nesdi.navy.mil



Dates Set for Program IPR

Each year, the NESDI program holds IPRs to check in on the progress made by the program's Principal Investigators and make sure that their efforts will achieve the intended results. These annual reviews bring together end users, resource sponsor representatives, and researchers—strengthening the gap between the research and required integration efforts. Each year, dozens of participants attend or dial in to hear briefings about ongoing projects and to provide valuable feedback to the program's Principal Investigators.

Due the travel restrictions still in place for many of our Principal Investigators from the Naval Air Systems Command (NAVAIR), we decided to combine our west and east coast IPRs this year into a single IPR that will be held the week of 5-9 May 2014 in Port Hueneme, CA.

May 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
	Port Hueneme, CA					
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

As always, space for our IPRs is limited. To request a seat or for more information including a draft agenda and dial-in information, contact Cindy Webber at cynthia.webber@navy.mil or 760-939-2060.



Program Schedule

For the next couple of months, the program will concentrate its efforts on the collection and evaluation of full proposals to address the priority needs that were collected, screened, evaluated, and ranked as part of the program's FY14 needs solicitation process. A program schedule for the entire year is provided below.

NO.	WHAT	WHEN
1.	Conduct In-Progress Review	5-9 May 2014 (Port Hueneme, CA)
2.	Evaluate Full Proposals	9 May 2014
3.	Obtain Sponsor Review & Approval of Full Proposals	3 July 2014
4.	Announce New Starts	30 July 2014
5.	Announce FY15 Needs Solicitation	2 June 2014
6.	Close FY15 Needs Solicitation	1 August 2014
7.	Screen Needs	11-15 August 2014
8.	Evaluate & Rank Needs	8-12 September 2014
9.	Obtain Sponsor Review & Approval of Needs	15-26 September 2014
10.	Request Pre-proposals	10 October 2014
11.	Conduct CNO N45 Programmatic Review	22 September - 3 October 2014
12.	Close Pre-proposal Collection	12 November 2014
13.	Collect TDWG Comments on Pre-proposals	17 November 2014
14.	Evaluate Pre-proposals	17-21 November 2014
15.	Request Full Proposals	11 December 2014
16.	Collect Full Proposals	18 February 2015
17.	Deadline for Functional Working Group Comments on Full Proposals	13 March 2015
18.	Collect TDWG Comments on Full Proposals	20 March 2015
19.	Screen Full Proposals	23-27 March 2015
20.	Deadline for Principal Investigators to Answer Screening Questions	27 April 2015
21.	Quarterly Status Reports Due (all Mondays)	7 July 2014 6 October 2014 5 January 2015 6 April 2015

Check out our web site (www.nesdi.navy.mil) for the latest version of our program schedule.



GETTING ON OUR MAILING LIST

If you're not already on our mailing list and want to subscribe to *NESDI News*, please send your email address to Lorraine Wass at 207-384-5249 or ljwass@surfbest.net.

CONTACT YOUR TDWG MEMBER

For more information about the operation of the NESDI program, contact Leslie Karr, the program manager, or members of the TDWG.

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4.	Cahoon, Lynn	NAVAIR	252-464-8141	albert.cahoon@navy.mil
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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 summer 2014 issue, we will provide you with updates on our efforts to evaluate and rank the full proposals we received.

Until then, look for the following articles about several of our successful projects in upcoming issues of *Currents*, the Navy's energy and environmental magazine:



- Studying the Impact of Seafloor Cables on the Marine Environment: NESDI Project Provides Scientific Methodology & Data to Aid in Sound Decisionmaking
- Diverting Food Waste from Landfills Saves Money & the Environment: NESDI Project Includes New Guidance Document for Navy Solid Waste Managers

You can read *Currents* on-line and subscribe to the magazine at:
<http://greenfleet.dodlive.mil/currents-magazine>.