

NESDI NEWS

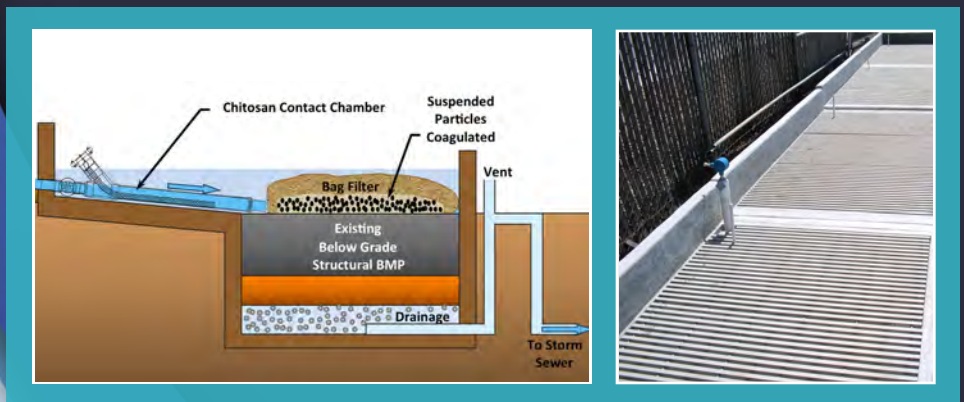
Highlights & Happenings



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 Environmental Readiness Division (OPNAV N45) and managed by the Naval Facilities Engineering Command (NAVFAC). 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 Winter 2013 issue of NESDI News: Highlights & Happenings—part of our ongoing effort to keep you informed about the NESDI program.

The program has collected pre-proposals to address many of the needs we have collected during our FY13 solicitation. The next significant milestone on the NESDI program schedule is the submission and review of full proposals. Of the pre-proposals that were received, we requested full proposals for the following:

NO.	PRE-PROPOSAL TITLE	NEED TO BE ADDRESSED
1.	Evaluation of Low Impact Development (LID) Implementation (167)	Effective Operation and Maintenance of Stormwater Best Management Practices (BMP)/LID (N-0907-13)
2.	Sustainable Remediation of Low Ph Aquifers and Aquifers with a Continuing Contaminant Source Using Proton Reduction Technology (168)	Demonstration of Sustainable Remedy for Treating a Low-pH Aquifer Contaminated with Continuing Source of Chlorinated Ethenes, Tetrachloroethene (PCE), and Trichloroethene (TCE) from a Closed Landfill (N-0869-13)
3.	Emissions Capture Technology for Oxy-Fuel Hull Cutting Operations (169)	Develop a Process and Equipment to Capture Smoke Plume from Oxy-Fuel Cutting Torch During Ship Demolition (Need N-0900-13)
4.	Aerobic Bioaugmentation for Remediation of Royal Demolition explosive (RDx)-Contaminated Groundwater (171)	Alternative Treatment Technology to Pump and Treat for Munitions Constituent-Contaminated Groundwater (N-0874-13)
5.	Drydock Sediment Discharge Pump (173)	Drydock Sediment Management (N-0887-13)
6.	Biological-Fouling (Bio-Fouling) Reduction to Ships Cooling Water Systems (175)	Bio-Fouling Reduction to Ships Cooling Water Systems (N-0870-13)
7.	Elimination of Ship Cooling Water Discharges during Dock Side Operations (177)	Bio-Fouling Reduction to Ships Cooling Water Systems (N-0870-13)
8.	Evaluation and Implementation of Compliance Options for National Pollutant Discharge Elimination System (NPDES) Cooling Water Intake Structures at Existing Facilities (178)	Compliance Options Study for NPDES for Cooling Water Intake Structures at Existing Facilities (N-0861-13)
9.	Lifecycle Cost—Operation and Maintenance of Stormwater BMPs/LID (179)	Effective Operation and Maintenance of Stormwater BMPs/LID (N-0907-13)
10.	Demonstration of Non-Chromated Adhesive Bond Primer for Metal Repair Bonding (185)	Elimination of Hexavalent Chromium from Aircraft Structural Adhesive Bonding (N-0895-13)
11.	Low-Volatile Organic Compound (VOC) and -Hazardous Air Pollutant (HAP) Wipe Solvent and Paint Thinner Demonstration/Validation (Dem/Val) (186)	Low-VOC and -HAP Wipe Solvent and Paint Thinner Dem/Val (N-0871-13)
12.	Drydock Sediment Management (187)	Drydock Sediment Management (N-0887-13)



Integrating Technologies

Taking on Stormwater

Navy stormwater managers work aggressively to remove pollutants found in stormwater generated at industrial installations. Runoff from industrial areas can contain heavy metals, suspended solids, and oil and grease at levels that may exceed NPDES permit limits and benchmarks.

For the past several years, Gary Anguiano has been leading a team of engineers from the Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EXWC) (formerly the Naval Facilities Engineering Service Center) and other organizations to demonstrate and validate commercially available stormwater management systems and new systems as possible BMPs to maintain pollutant concentrations below permitted levels.

Recent stormwater projects at NAVFAC EXWC include developing and maintaining a website (the Stormwater BMP Decision Support Tool available at www.p2sustainabilitylibrary.mil/stormwaterbmp/hm.html) that promotes sound stormwater management practices and demonstrating an optimized below-grade dual media filtration system and an above-grade system known as the Linear Treatment System (LTS) at the Navy Regional Recycling Center (NRCC) in San Diego, CA. Gary is also taking the lead on a smart water conservation system for irrigated landscapes, a joint venture between the NESDI program and the Environmental Security Technology Certification Program (ESTCP).



Improved BMPs for Stormwater Runoff (Project #210)

Gary and his team developed a web-based expert system, the Stormwater BMP Decision Support Tool, to help Department of Defense (DoD) installation and activity users identify the most effective stormwater BMPs to address runoff requirements. The website is based on a review of proven BMPs and lessons learned from past and ongoing BMP projects performed by the DoD, government, and private sector. For example, the website includes the below-grade Dual Media Filtration System BMP developed through the NESDI program (also under NESDI project #210) and demonstrated by ESTCP. The website ties BMPs to Navy specific industrial operations, site conditions, and discharge limits.



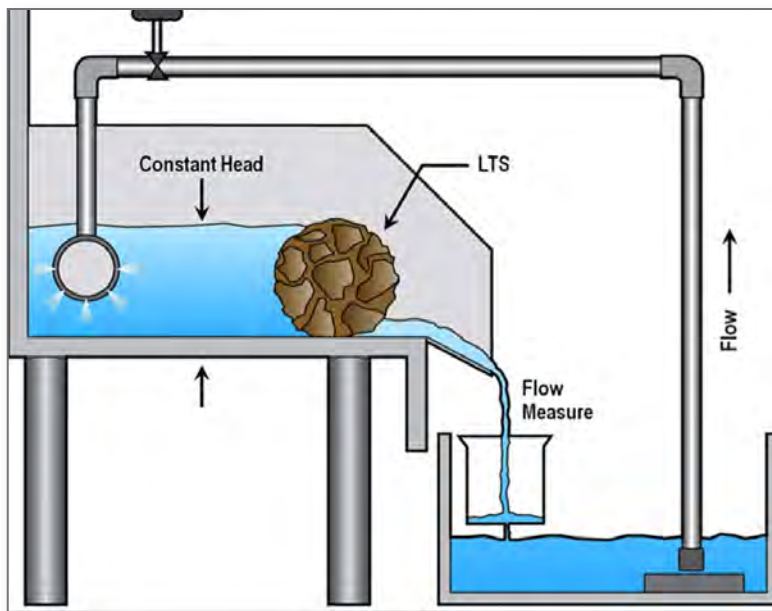
Laboratory scale test bed.

Metals Removal from Stormwater Using LTS (Project #430)

The NRRC is one of the Navy’s recycling centers that accepts used and scrap materials, such as metals, paper, cardboard and plastic, for recycling and resale. The center currently uses a full scale, structural dual media

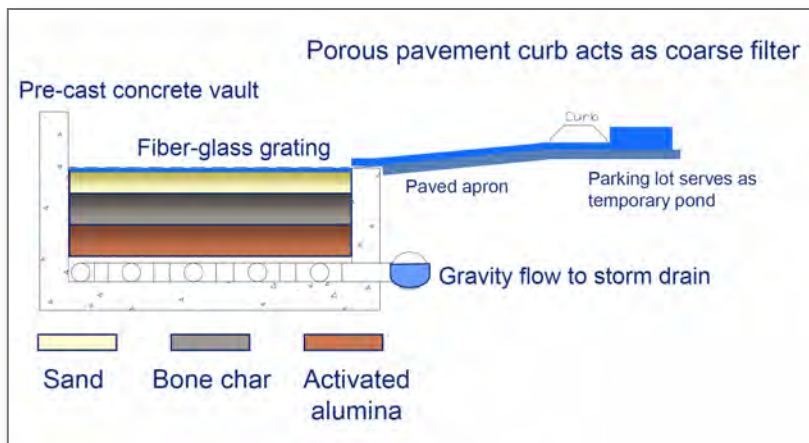
filtration system to remove toxic metals from stormwater runoff. Although the system is currently working, fine particle solids (silt) have been prematurely plugging the filtration system, leading to increased maintenance and reduced effectiveness. Some method of pre-treatment is needed to optimize the existing system. Gary and his NAVFAC EXWC team sought an expedient approach that would offer a quick response to an immediate need while also offering an opportunity to test additional non-structural BMPs for potential as stand-alone, above grade use.

The EXWC team looked for existing BMP techniques that might be adapted to this need. One BMP technique often used at new construction sites is to place straw wattles (rolls) to capture suspended solids in stormwater runoff. Working with this concept of a LTS, the NAVFAC EXWC team developed a bench-scale apparatus to evaluate multiple combinations of adsorptive media within fiber rolls. Each combination was tested for total



Schematic of laboratory scale testing.

(continued on the next page)



Dual media filtration system installed at NRRC.

suspended solids (TSS) filtration, dissolved metals removal efficiencies and hydraulic capabilities. Qualitative measures included operation and maintenance costs and system durability. The test performance objectives were based on NPDES standards for discharge to San Diego Bay.

In this testing, each media type was tested in a wattle (or roll) for both hydraulic capabilities and TSS and dissolved metals removal efficiencies. The laboratory-scale testing showed one of the LTSs was capable of removing significant levels of TSS and dissolved copper and zinc from a synthetic stormwater solution. The LTS had 79 percent removal efficiency for TSS and dissolved copper and zinc. The laboratory-scale results exceeded the 75 percent dissolved metals quantitative performance objective, and were just one percentage point below the 80 percent TSS quantitative performance objective established by the California Regional Water Quality Control Board, San Diego Region.

Although LTS combinations were unable to simultaneously meet all of San Diego Bay's stringent performance objectives for a stand-alone BMP, the high metals removal efficiencies

of selected materials show promise for other applications and possibly for other locations. Other industrial sites might be able to use the filter wattle depending on site-specific permit requirements and hydraulic conditions. Using results from this LTS demonstration, the NESDI program initiated a subsequent project to develop a low maintenance retrofit to the existing below-grade BMP to improve its performance.

Optimization of the Stormwater Dual Media Filtration System at the NRRC in San Diego (Project #454)

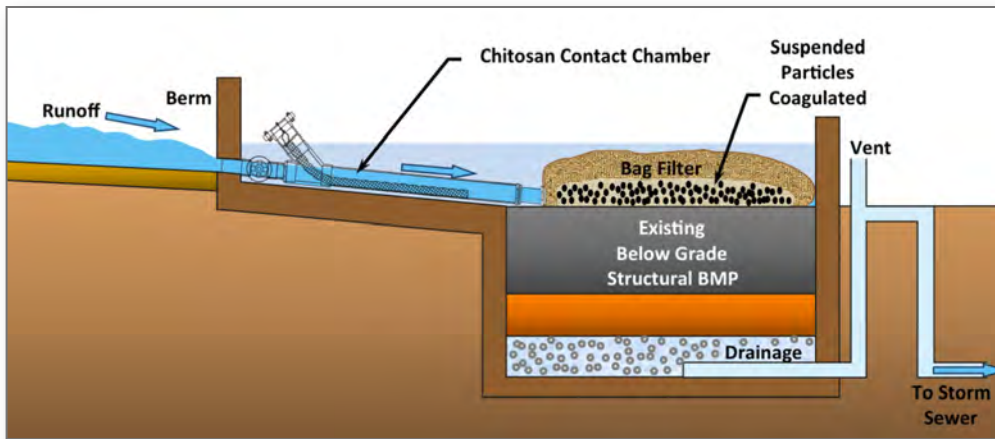
This project will incorporate a pre-filtering system to remove particularly fine suspended solids from industrial site stormwater runoff. These types of solids have increased maintenance demands and have diminished the system's performance reliability for meeting permit requirements. Gary and his team developed and integrated a low cost, innovative, two-stage filter process that utilizes filtering and adsorption media (bone char and activated alumina) to filter out solids and metals. The installed system has a relatively low capital (\$20,000 per acre of

drainage) and operational costs and requires little land area.

This project is testing the effectiveness of a low-maintenance filter sock mesh containing flocculating material placed immediately upstream of the structural BMP. Such a filtration add-on could enhance the performance of any below-grade structural BMP. If successful, this technology will significantly decrease the frequency of labor-intensive maintenance while allowing industrial facilities to consistently meet NPDES permit requirements.

Smart Water System for Irrigated Landscapes

Several DoD installations are experiencing high water costs, regional water shortages, and regulatory constraints including the quantity of water used as well as constraints influencing use of alternative sources of water for landscape irrigation such as recovered grey water. Anecdotal data collected by NAVFAC EXWC personnel during a literature search at the beginning of this project suggests that potable water consumption used for landscape irrigation can be reduced by greater than 50 percent by utilizing



Schematic of filtration BMP for optimizing a dual media system.

smart water conservation systems that incorporate concepts such as smart weather tracking controllers, site-specific sensor inputs; rainwater, and heating, ventilating, and air conditioning (HVAC) condensate harvesting. Gary Anguiano and his colleagues can demonstrate a quantifiable 50 to 70 percent savings in water used for landscape irrigation from their calculations associated with the smart systems they are evaluating.

The objective of this project is to demonstrate and validate the retrofit of existing landscape irrigation systems with smart water conservation systems that reduce the costs of water used for landscape irrigation and that can more efficiently irrigate the landscape surrounding DoD buildings.

Smart water conservation systems provide DoD with options for preserving green landscape assets (athletic fields, parade grounds, etc.) while simultaneously reducing potable water demand for landscape irrigation. This project will demonstrate an integrated suite of commercially available smart water conservation technologies for irrigated landscapes (turf and low-water ground cover). Specific technologies that will be tested include:

1. Advanced evapotranspiration irrigation controllers
2. Centralized and site-specific sensor inputs (rain, ambient temperature, soil moisture, leak detection)
3. Efficient water delivery systems
4. Roof top rainwater and HVAC water condensate harvesting systems to displace potable water consumption for irrigation

DoD currently operates numerous facilities that utilize irrigation processes (sprinkler lines, hoses, etc.) that will become increasingly difficult to sustain given the limited water supplies in many locations and

the projected future water demand growth. The U.S. Environmental Protection Agency estimates that more than half of the potable water used in conventional landscape irrigation processes is lost to evaporation, wind, and overwatering. DoD needs detailed cost and performance data and specific guidance to fully implement a smart water irrigation system. Replacing current irrigation practices with smart water conservation systems that utilize rainwater and HVAC condensate harvesting for irrigating DoD landscapes are likely to cut the current potable water consumption and costs at many DoD facilities by up to 70 percent.

For more information about these projects, contact Gary Anguiano at 805-982-1302 or gary.anguiano@navy.mil. Gary 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.



Names & Faces: **NESDI Profiles**

In this issue of *NESDI News*, we profile Gary Anguiano — the Principal Investigator for our efforts to demonstrate and validate commercially available stormwater management systems and new systems as possible BMPs.



Gary Anguiano

Organization

Naval Facilities Engineering and Expeditionary Warfare Center

Education

B.S. in Civil Engineering,
California Polytechnic University,
San Luis Obispo

Experience

Prior to joining the Navy, I worked as a draftsman and surveyor for an engineering firm specializing in land development in San Luis Obispo, CA. My first job with the Navy was working with the Amphibious and Advanced Base Department of the Naval Civil

Engineering Laboratory. There, I worked on a number of efforts including development of an intake system for the Marine Corps Reverse Osmosis Water Purification unit and the Navy's War Damaged Facilities and Pipeline Repair Program. For the last 15 years, I have worked for the Technology Development Branch in the Environmental Department of NAVFAC EXWC and its preceding organizations. In this capacity, I have led a number of stormwater projects that leveraged new technologies or practices to meet compliance requirements.

Role

I have been a Principal Investigator on a variety of DoD projects including working on NESDI- and ESTCP-funded projects. In this capacity, I serve as a project team lead working closely with customers, project engineers, contractors, technicians, and regulators. Much of our stormwater work requires demonstrating new technologies that can consistently meet stringent NPDES pollutant discharge limits at our Navy industrial sites. The result of some of this work has led to the development of an innovative below grade dual media absorption system to remove dissolved copper and zinc from stormwater runoff generated from industrial areas including Navy drydocks, historic buildings, and recycling centers.

Connections

I have had the privilege to work on a number of joint assignments with Army and Air Force environmental and engineering commands.

Perspective

Navy installations are faced with numerous day-to-day environmental challenges and rely on the NESDI program to find cost effective technology solutions. The NESDI program has been the gateway for advancing our stormwater knowledge base and resolving many of the Navy's stormwater compliance issues.



For more information about Gary's projects and his role in the NESDI program, read the Integrating Technologies section in this issue of *NESDI News*.

**Gary Anguiano
Selected As
NAVFAC EWXC
Engineer of the Year
for 2012**

Each year NAVFAC participates in the National Society of Professional Engineers Federal Engineer of the Year Award program to recognize the exceptional contributions that NAVFAC engineers make to the profession of engineering, the Navy, and the communities in which they live. For 2012, Gary Anguiano was selected as Engineer of the Year for NAVFAC EXWC. Gary earned this award for his many years of work in wastewater, stormwater, and water reclamation technology as well as his many years of engagement with his local community and his positive attitude in and outside of the workplace.

**The NESDI program
congratulates one of its own
on this great honor!**

Second NESDI Stormwater In-Progress Review Connects Puget Sound End Users with Program Personnel & Investigators

In an effort to address the ongoing challenges of effectively managing stormwater at Navy facilities, the NESDI program convened a meeting of stormwater end users, researchers, and policymakers in Silverdale, Washington on 28-29 November 2012.

In addition to personnel from the program's resource sponsor organization, OPNAV N45, end users from across the Puget Sound's Navy community joined NESDI personnel in person and over the phone to ensure existing projects and future investments are properly focused, efficiently executed, and successfully integrated.

Nearly four dozen participants attended or dialed-in to hear briefings about ongoing projects and to provide valuable feedback to Principal Investigators. One of the projects discussed included a new effort to identify sources of copper and zinc in stormwater runoff through the use of a Graphical Information System infrastructure combined with a pollutant transport tool. Another project is applying the marine Biotic Ligand Model for copper, a method that has already been developed and validated for protection of sensitive saltwater organisms, for usage with salmonids and forage fish.

Attendees also toured the Puget Sound Naval Shipyard (PSNS) to see firsthand the environment in which many NESDI projects must operate. The group met with the environmental manager and staff at the shipyard, and most notably, toured the shipbreaking operations in one of the shipyard's drydocks to better understand the challenges associated with opacity (particulate matter emissions) and other issues.

Several NESDI projects have been funded to address this issue. The first, an Initiation Decision Report (IDR), identified the best available alternatives to oxy-fuel cutting to bring daily opacity levels below air quality limits. The IDR recommended the use of MagneGas™ in place of propane for hot cutting and a follow-on project was initiated to demonstrate this technology. Another technology identified by the IDR was cold cutting, a process that eliminates opacity and the basis for another follow-on project. Another NESDI project being conducted aboard PSNS is experimenting with ways to increase the efficiency and lower the operating cost of one of the shipyard's Oily Water Treatment System.



Save the Date for Our 2013 In-Progress Reviews

Save the date for our 2013 In-Progress Reviews (IPR) to be held during the weeks of 6-10 May in Port Hueneme, California and 10-14 June in Jacksonville, Florida.

Each year, the NESDI program holds IPRs on the east and west coasts to check in on the progress made by our Principal Investigators and make sure that their efforts will achieve the intended results. These annual reviews bring together our end users, resource sponsor, 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 our Principal Investigators.

Space is limited. To request a seat and for more information including draft agendas and dial-in information, contact Cindy Webber at cynthia.webber@navy.mil or 760-939-2060.

May 2013						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6 Port Hueneme, CA	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June 2013						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10 Jacksonville, FL	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Program Schedule

From now through the beginning of the summer, the program will concentrate its efforts on the collection, analysis, and ranking of full proposals to address many of needs collected during our FY13 solicitation.

NO.	WHAT	WHEN
1.	Collect Full Proposals	21 February 2013
2.	Deadline for Functional Working Group Comments on Full Proposals	15 March 2013
3.	Collect TDWG Comments on Full Proposals	22 March 2013
4.	Screen Full Proposals	25-29 March 2013
5.	Deadline for Principal Investigators to Answer Screening Questions	29 April 2013
6.	Evaluate Full Proposals	10-14 June 2013 (at East Coast IPR)
7.	Obtain Sponsor Review & Approval of Full Proposals	28 June 2013
8.	Announce New Starts	30 July 2013
9.	Announce FY14 Needs Solicitation	20 May 2013
10.	Close FY14 Needs Solicitation	26 July 2013
11.	Screen Needs	12-16 August 2013
12.	Evaluate & Rank Needs	9-13 September 2013
13.	Conduct N45 Programmatic Review	25 September 2013
14.	Obtain Sponsor Review & Approval of Needs	16-27 September 2013
15.	Quarterly Status Reports Due (all Mondays)	7 January 2013 1 April 2013 1 July 2013 7 October 2013
16.	Conduct In-Progress Reviews	6-10 May 2013 West Coast IPR (Port Hueneme, CA) 10-14 June 2013 East Coast IPR (Jacksonville, FL)
17.	Request Pre-proposals	11 October 2013
18.	Close Pre-proposal Collection	13 November 2013
19.	Collect TDWG Comments on Pre-proposals	25 November 2013
20.	Evaluate Pre-proposals	26-29 November 2013
21.	Request Full Proposals	12 December 2013

Check out our web site at 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 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.

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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 spring 2013 issue, we will reveal the results of our solicitation for full proposals and provide you with the latest information about our upcoming west coast and east coast IPRs.

Until then, look for an article about the results of our research entitled "Treating Dredged Sediments for Beneficial Use: Pilot Project Investigates the Feasibility of Using Dredged Material as Soil Product" in the spring 2013 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>.

