

WINTER 2016



NESDI NEWS

Highlights & Happenings

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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.

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) out of the Engineering and Expeditionary Warfare Center in Port Hueneme, California. 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.



The NESDI Program: Integrating Green Technologies Into the Fleet



From the Program Manager's Desk

Welcome to the winter 2016 issue of *NESDI News*:
Highlights & Happenings—part of our ongoing
effort to keep you informed about the NESDI program.



Ken Kaempffe
Program Manager

I'd like to start off by welcoming David Kopack to our management committee—the Technology Development Working Group (TDWG).

David brings a wealth of experience to our governing board, providing a much-needed perspective from the headquarters of the Naval Sea Systems Command.

David will provide valuable guidance to ensure that our shipyard projects are well conceived and that our final products can be implemented at multiple shipyards whenever possible.

Next, I'd like to highlight our progress towards meeting our financial benchmarks. At the end of first quarter fiscal year (FY) 2016, the NESDI program had obligated 68 percent and expended 12 percent of its funding. So we met our first quarter obligation benchmark (of 22.5 percent), but were a couple percentage points below our expenditure benchmark (of 13.8 percent). Due to budget reductions in FY14 and FY15 we had to defer and delay many projects and tasks. As a result, currently we have strong financial demands from this backlog of work. As of the end of February 2016, we are on track to meet our mid-year financial benchmarks.

We've also just released our latest Year in Review report which highlights our program

and project accomplishments over the course of FY15. More information is provided in the "FY15 Annual Report Highlights Program Successes" section of this issue of *NESDI News*.

In January, the TDWG and I screened and ranked pre-proposals that were received to address the priority needs collected via our FY16 needs solicitation process. More information about the results of our pre-proposal review are included in the following section.

We have also been busy building agendas and handling the logistics for our two FY16 In-Progress Reviews (IPR)—the first that was held in China Lake earlier this month for our west coast projects. Kudos to Cindy Webber, a China Lake resident and key member of our TDWG for all that she and her staff did to make our 2016 west coast IPR a huge success. Thank you Cindy! A second IPR will be held at the Washington Navy Yard for our east coast projects the week of 2-6 May. Details about the success behind our west coast IPR and plans for our east coast IPR are included in the "2016 West & East Coast IPRs" section of this issue of *NESDI News*.

Ken Kaempffe
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Results of FY16 Pre-Proposal Solicitation

All in all, we collected a total of 41 pre-proposals to address the priority needs that resulted from our FY15 solicitation process. The next significant milestone on the NESDI program schedule is the 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 20 January 2016.

Full proposals were requested for those pre-proposals that do 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 26 pre-proposals:

No.	ID	Title
1.	246	Naval Air Systems Command Solutions for Engine Washing
2.	247	Smart Electronic Tools for Navy Environmental Compliance Monitoring and Reporting
3.	249	Impact of Sediment Resuspension by Propeller Wash and Shore Sediment Dynamics on Remediation Options
4.	250	A Comprehensive Analysis and Strategy for Contaminated Sediment Management
5.	251	In Situ Treatment of 1,4-Dioxane using Enhanced Biodegradation
6.	254	Stable-Isotope Labeled Tracers: An Innovative Way to Validate Natural Attenuation of RDX in Groundwater
7.	256	Plasma Enhanced Melter to Reduce Hazardous Wastes and Generate Energy
8.	258	Microfluidic Paper-based Sampling and Capillary Electrophoresis Detection for Rapid Preconcentration/Separation of Insensitive Munitions Explosives
9.	260	Demonstrate and Validate Acceptable Ground Support Equipment Primers
10.	261	Stable Carbon Isotopes for Tracing in situ RDX Remediation
11.	262	Zinc-free Inorganic Primers and Coatings for Active Corrosion Protection
12.	263	A Methodology for Assessment and Removal of Storm Conveyance and Intertidal Zone Polychlorinated Biphenyls
13.	264	Hexavalent Chromium Reduction Technology at Navy Fleet Readiness Centers
14.	265	NPDES Copper Effluent Control System
15.	266	Industrial Pier Area Testing of Best Stormwater Pollutant Reduction Measures
16.	268	Survey of Waste Management and Minimization Strategies
17.	269	Validation Testing of an Optional, Large Scale Sustainable Liquid Propane Fast Cook-off Burner
18.	270	Demonstration of Improved Toxicity Methodology to Link Stormwater Discharges to Receiving Water Impacts at Navy Sites
19.	271	Sewer Gas Elimination Technology
20.	274	Superhydrophobic Coating for Corrosion Prevention and Leachate Impedance
21.	275	Forward Looking Infrared (FLIR) for Advanced Discharge Characterization
22.	276	Technologies, Process Knowledge & Capabilities that Increase Waste Plastics Diversion
23.	278	Preventative Management of Contaminated Silt
24.	279	Utility Vault Water Treatment
25.	280	Background Analysis and Tracer Study to Identify Metal Contaminant Source Contributions to Stormwater Runoff
26.	283	Demonstration of Optimized non-NMP (n-Methyl pyrrolidone) Solvents for Immersion Chemical Depaint

The call for full proposals ran from 20 January until 16 March of this year. (Full proposals are solicited by invitation only.) Successful proposals will result in new projects beginning in FY17 and beyond.



New Project Initiatives

In this issue of *NESDI News*, we introduce you to two more of our FY15 “new start” projects—both of which pertain to the potential adverse impacts of water conservation measures on Navy drinking water systems. Project no. 524 (Innovative Hydrant Flushing) is experimenting with a method to maintain the required disinfectant residual in Navy drinking water systems without using large quantities of water to flush the system. Project no. 528 (Impacts of Water Conservation Measures on Safe Drinking Water in Navy Water Supply Systems) is studying the potential impact of water conservation efforts on Navy drinking water supply systems including how those systems may be impacted by dramatic reductions in water consumption.

Tackling Nitrification in Drinking Water: Team to Demonstrate a Truck-mounted Solution with Zero Water Waste (Project no. 524)

Navy and Marine Corps installations worldwide are required to maintain a disinfectant residual in drinking water systems. The chlorine or chloramine residual prevents bacteriological growth in the drinking water and is required under the Safe Drinking Water Act (SDWA) and associated Chief of Naval Operations Energy and Environmental Readiness Division instructions. However, this chlorine

residue tends to be “consumed” by a buildup of biofilms and sediment in most water systems. Additionally, nitrification or trihalomethanes (THM) may also build up in the water distribution system. (Nitrification increases nitrite and nitrate levels, and promotes bacterial regrowth.) To maintain compliance, naval bases flush hydrants with millions of gallons of potable water to eradicate stagnant water, clean the pipes, increase the disinfection residual in the pipes, and flush out the nitrates and THMs.

At many locations, including Naval Base Ventura County (NBVC) Port Hueneme and Naval Air Station Lemoore, California, the effective scouring velocity cannot be achieved by traditional hydrant flushing. At these bases, water lines are repeatedly flushed weekly—but even this procedure fails to remove all the biofilm, so nitrification continues to occur.

The flushing process can require a tremendous amount of water—over a million gallons of water per year for one hydrant.

In addition, the flushing process can require a tremendous amount of water—over a million gallons of water per year for one hydrant. These California bases (and likely others) need an efficient way to maintain



The NO-DES truck. (Photo Credit: Low Impact Development Center)

disinfectant residual without utilizing large amounts of water in the midst of a severe and ongoing drought.

This project, led by Tami Relph from the Naval Facilities Engineering and Expeditionary Warfare Center (EXWC), will demonstrate and evaluate one promising solution—a truck-mounted potable water distribution system which has been used effectively in over 50 municipalities to date.

To effectively clean pipes, a scouring velocity of five cubic feet per second needs to be achieved. In conventional hydrant flushing, the velocity is only one to three cubic feet per second. Also, conventional flushing cleans pipes randomly, and there is no control in directing “dirty” water away from already cleaned pipes.

The high-velocity truck-mounted system chosen for this demonstration can provide on-the-spot water treatment and analysis by creating a temporary connection into the water distribution line through existing fire hydrants. The Neutral Output Discharge Elimination System (NO-DES) connects

The water is disinfected and returned to the water system, resulting in zero water waste.

between two fire hydrants or between a fire hydrant and a fully open blow-off valve. The water from the hydrant is run through a filter system mounted on the truck in order to remove biofilm and clean out the line. The water is disinfected and returned to the water system, resulting in zero water waste.

In this demonstration of the NO-DES system, the drinking water system at the NBVC Port Hueneme base will be flushed. Prior to this flushing, water quality parameters will be collected to establish a baseline. The same parameters will be collected during and after flushing to determine the system’s effectiveness. Additionally, the base will be monitored for nitrification and chloramines for one year. At the end of this period, an economic analysis will be conducted to compare the costs of purchasing the equipment versus contracting for the flushing as a service as a better option to conventional hydrant flushing.

At the conclusion of the project, the Naval Facilities Engineering Command’s Water Media Field Team will be invited to a demonstration of the NO-DES system so they can recommend this technology to their regional bases if appropriate. The team will also prepare a video of the NO-DES system in use, so that Navy public works directors can see the ease with which the system is set up and utilized. Datasheets, which will include associated capital and contracting costs, will be produced and distributed to all Navy public works offices. A final report will also be prepared and made available via the NESDI web site.



New Project Initiatives *(continued)*

Studying Drinking Water Quality in the Age of Water Conservation: Reduced Volume & Flow May Impact Compliance Status (Project no. 528)

Widespread water conservation measures across the Department of Defense often result in less water moving through distribution and storage systems. When this happens, the system can be at increased risk for SDWA violations.

Navy installations commonly struggle to maintain residual chlorine levels in their water distribution and storage systems without exceeding the total THM standard at the far reaches of those systems. The levels of THMs and other byproducts of chlorination tend to increase with the amount of time water remains in a system.

To date, there has been no comprehensive trend analysis that demonstrates how water conservation efforts may contribute to the deterioration of drinking water quality. It is the goal of the project to assess a representative sample of drinking water systems to gain a better understanding of the impact of declining consumption from these systems.

There are a number of fundamental characteristics of drinking water supply systems common to many Navy facilities that may impact SDWA compliance:

- Low density land use planning strategies can lead to relatively long distribution runs between the supply system complex and the buildings it is designed to supply.
- Declining staffing levels can lead to reductions in total water demand.
- The capacity of aging water systems that were originally oversized to provide for fire flows can provide space for water to stagnate.
- The roughness of existing piping materials can allow for and even encourage development of biofilms (biomass).
- Aggressive water conservation strategies can reduce both facility and irrigation consumption rates.
- Regulatory standards that address water quality within the distribution system are becoming increasingly more rigorous.

Aggressive water conservation strategies can reduce both facility and irrigation consumption rates.

To meet water quality compliance standards, the Navy often relies on flushing and cleaning pipe networks, which has the potential to defeat water conservation goals, and doesn't always solve the problem.



This project is studying the potential impacts of water conservation measures on Navy drinking water systems. (Photo Credit: U.S. Navy photo by Photographer's Mate 1st Class Bart A. Bauer)

Though this project will concentrate on the impacts of water conservation efforts, it will also identify operational, systemic or long-term policy changes that would minimize compliance problems. Additionally, the project team will assess trends in an attempt to more accurately evaluate future regulatory challenges that should be considered by drinking water system planners.

In the first phase of this project, the team, led by Prakash Temkar from EXWC, will gather a representative sample of drinking water system characteristics, examine Notices of Violation, identify system problems, and define the current state of the practice. Representative case studies will be developed

based on observed “real world” systems and problems.

Next, the project team will engage a group of Navy drinking water system experts to analyze specific systems and problems and recommend alternative strategies to address these problems. The team will then conduct a table top analysis of existing system designs including current water consumption rates and associated water conservation efforts.

Finally, the team will analyze specific recommended strategies based on anticipated benefit, cost, and potential risks. The team will also attempt to identify and evaluate operational Best Management Practices (BMP), low-cost structural BMPs, and systemic (long-term) BMPs.

A final report, in the form of a guidance manual, will be prepared for use by Navy water program managers. The guidance manual will include examples of “real world” applications of the identified strategies including the tools, techniques and management practices to effectively control water quality problems in distribution systems and meet SDWA regulations.

|| Submit Your Photo!

Recommend Your Site!

We are always looking for good pictures of our project demonstrations in progress. We’d also like to hear your suggestions for 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*.



2016 West & East Coast IPRs

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—shrinking 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.



TDWG members and NESDI Principal Investigators tour Little Petroglyph Canyon aboard Naval Air Weapons Station China Lake.

(Photo Credit: Pat Earley and Cindy Webber)

At our west coast IPR held last month, it was evident that NESDI Principal Investigators continued to excel in addressing persistent and difficult environmental issues. Over 60 attendees from more than two dozen different organizations participated in our west coast IPR either in person or over the phone to receive the latest information on a number of our ongoing projects. Attendees also toured many of the base's critical facilities including the chemistry, materials and propulsion laboratories. The week culminated with a tour of one of the base's most popular and significant cultural resources—Little Petroglyph Canyon.

This year our east coast IPR will be held at the Washington Navy Yard during the week of 2-6 May 2016. Attendees will receive the latest information on a number of our projects being led by Principal Investigators based on the east coast.



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



The Latest Project Fact Sheets On-line

Navy Environmental Sustainability Development to Integration (NESDI) Program

Current Projects: Define your filter and sort criteria, then click 'Go'

Export Results: 231 projects Pg 1 of 10

ID	Project Title	Status	Objective	More Information
528	Impacts of Water Conservation Measures on Potential Safe Drinking Water Act Violations in Navy Water Supply Systems	Active Project	This project will study the potential impact of water conservation efforts on Navy drinking water supply systems including how those systems may be impacted by dramatic reductions in water consumption. In certain instances, these reductions can cause water to remain in distribution and storage systems for excessive periods of time that may lead to violations of the Safe Drinking Water Act (SDWA).	Fact Sheet
527	Structure-function Relationship and Environmental Behavior of Per- and Polyfluorinated Substances	Active Project	This project will provide environmental restoration (ER) managers and Remedial Project Managers (RPM) with better tools for building accurate conceptual site models to better manage sites impacted by perfluorinated and polyfluorinated substances.	Fact Sheet
526	X-ray Inspection System to Demilitarize Targets	Active Project	This project will demonstrate and validate a portable X-ray machine to find projectiles lodged in Navy boat targets.	Fact Sheet
525	Non-Isocyanate Polyurethane-Free Formulation Coatings for Aircraft and Support Equipment	Active Project	The goal of this project is the qualification, approval and transition of polyoxane topcoats as a replacement for isocyanate-containing formulations. The selected formulation will also be compatibility tested with chromium-free primer systems.	Fact Sheet
524	Innovative Hydrant Flushing	Active Project	This project will demonstrate and evaluate the effectiveness of using a truck-mounted potable water distribution system to prevent nitrification and maintain adequate free chlorine residual in Navy drinking water systems.	Fact Sheet
523	Integrated Diagnostic Stormwater Monitoring with Passive Sampling	Active Project	This project will evaluate the effectiveness of using passive sampling devices (PSD) to assess the impacts of stormwater runoff and improve stormwater management at Navy facilities.	Fact Sheet
522	Demonstration of New Strategies for Enhanced Monitored Natural Recovery at Navy Sediment Sites	Active Project	This project will demonstrate and validate the suitability of using uncontaminated natural sediments for the enhanced monitored natural recovery of contaminated sediments at Department of Defense and Department of the Navy sites.	Fact Sheet
521	Autonomous Benthic Ecology System	Active Project	This project will develop and test an Automated Benthic Ecology System (ABES) for the purpose of monitoring coral reef and benthic communities on vertical structures residing at Navy's at sea ranges, vessel homeports and weapons test and evaluation centers.	Fact Sheet
520	Quantification of Polychlorinated Biphenyls Paint Volatilization	Active Project	This project will investigate the volatilization rate of paint containing polychlorinated biphenyls (PCB) in order to generate a defensible, environmentally and fiscally responsible work process for the removal	Fact Sheet

Want insights into our new start projects?

Fact sheets for all of our new projects are now available on our web site and no username or password is required. Visit www.nesdi.navy.mil then select "Current Projects." You'll see a list of projects with our most recent efforts at the top of the list. Click on the "Fact Sheet" link in the "More Information" column for more insights.

Using Our Web Site

Direct any questions about our web site (www.nesdi.navy.mil) to our webmaster Eric Rasmussen at 732-323-7481 or eric.rasmussen@navy.mil.

Navy Environmental Sustainability Development to Integration (NESDI) Program

WELCOME TO THE NESDI PROGRAM

The mission of the NESDI 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.

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NESDI NEWS

Our Fall 2015 issue of NESDI News, Highlights, and Happenings is now available.

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PROGRAM EVENTS/HAPPENINGS

- The initial selection of this year's new start projects was announced.
- Our FY14 Annual Report is now available.
- Solicitation for needs ends 03 August 2015, [read more](#).

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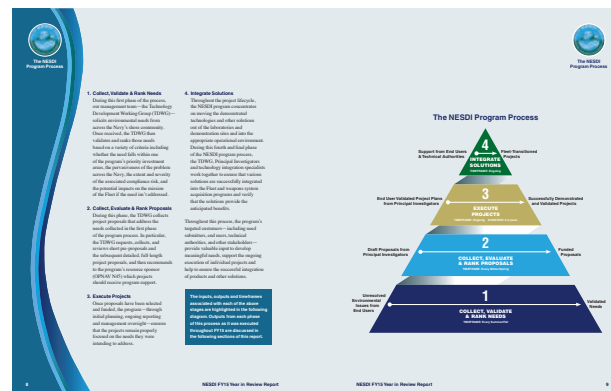
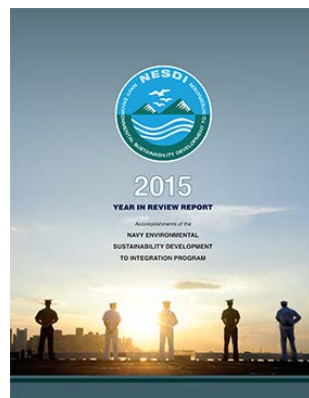
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www.nesdi.navy.mil



FY15 Annual Report Highlights Program Successes

The NESDI program has just released its most recent Year in Review report. The report profiles our “new starts” for FY15 and discusses projects that were particularly successful over the course of the year in demonstrating the use of an innovative technology or integrating critical information for stakeholders across the Navy.



For a hard copy of the NESDI program's FY15 and other Year in Review reports, please contact Lorraine Wass at 207-384-5249 or ljwass@outlook.com. An electronic (pdf) version of the report can also be downloaded from the program's web site at www.nesdi.navy.mil.



Program Schedule

For the next couple of weeks, the program will concentrate its efforts on the evaluation of full proposals to address the priority needs that were collected, screened, evaluated, and ranked as part of the program's FY16 needs solicitation process. A program schedule for the entire year is provided below.

No.	What	When
1.	Principal Investigator Answers to Full Proposal Screening Questions DUE	2 May 2016
2.	Conduct East Coast In-Progress Review	3-5 May 2016 (Washington Navy Yard, DC)
3.	Announce FY17 Needs Solicitation	1 June 2016
4.	Evaluate Full Proposals	by 6 June 2016
5.	Obtain Sponsor Review & Approval of Full Proposals DUE	17 June 2016
6.	Announce FY17 New Starts	29 July 2016
7.	Close FY17 Needs Solicitation	1 August 2016
8.	Screen Needs	8-12 August 2016
9.	Evaluate & Rank Needs	12-16 September 2016
10.	Obtain Sponsor Review & Approval of Needs	19 September - 7 October 2016
11.	Request Pre-proposals	14 October 2016
12.	Conduct OPNAV N45 Programmatic Review	November 2016
13.	Pre-proposals DUE	16 November 2016
14.	Make Pre-proposals Assignments to FWGs	2 December 2016
15.	TDWG & FWG Comments on Pre-proposals DUE	21 December 2016
16.	Evaluate Pre-proposals	9-13 January 2017
17.	Request Full Proposals	19 January 2017
18.	Conduct West Coast In-Progress Review	6-10 March 2017 (Location TBD)
19.	Full Proposals DUE	15 March 2017
20.	TDWG & FWG Comments on Full Proposals DUE	31 March 2017
21.	Screen Full Proposals	3-7 April 2017
22.	Quarterly Status Reports Due	4 April 2016 5 July 2016 3 October 2016 2 January 2017

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



WINTER 2016 NESDI NEWS

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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 ljwass@outlook.com.

Contact Your TDWG Member

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

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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 2016 issue, we will provide you with updates on our efforts to evaluate and rank the full proposals received by our March deadline.

Until then, look for an article about our eleven FY15 "new start" projects in the spring 2016 issue of *Currents*, the Navy's energy and environmental magazine. You can read our latest article "NESDI Program Launches Eleven Technology Initiatives in 2015" on-line and subscribe to *Currents* at <http://greenfleet.dodlive.mil/currents-magazine>.

