SPRING 2017

NESDI NEWS

Highlights & Happenings

INSIDE THIS ISSUE:

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 (EXWC) 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.

https://epl.navfac.navy.mil/nesdi

NAVFAC Naval Facilities Engineering Command

The NESDI Program: Integrating Green Technologies Into the Fleet

From the Program Manager's Desk

Welcome to the spring 2017 issue of *NESDI News: Highlights & Happenings*—part of our ongoing effort to keep you informed about the NESDI program.

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.

Ken Kaempffe
Program Manager

Our website has a new home at NAVFAC's Naval Technical Information Center (NTIC) in Port Hueneme, CA. Our new web address is https://epl.navfac.navy.mil/nesdi. All of the functionality that you experienced via our prior URL (www.nesdi.navy.mil), including methods for submitting needs and proposals and viewing our Year in Review reports and quarterly newsletters, is now available on the NTIC site.

Our new web address is https://epl.navfac.navy.mil/nesdi.

In addition to our new web address, and to comply with Navy security requirements, access to our website now requires a Common Access Card.

We have just completed our In-Progress Reviews (IPR) for this fiscal year at the Fleet Readiness Center (FRC) Southeast and the Naval Postgraduate School (NPS). For more insights, see "Successful IPRs Held at FRC Southeast & NPS" in this issue of *NESDI News*.

Members of our Technology Development Working Group (TDWG) and I have been busy screening and evaluating the full proposals that were received to address the priority needs collected via our FY17 needs solicitation process. Once we have completed our review and ranking of these full proposals, we will provide that ranked list to our resource sponsor (OPNAV N45) for their final review and approval. Successful full proposals will result in new projects beginning in FY17 and beyond. More information about the results of our full proposal review will be included in the summer 2017 issue of *NESDI News*.

Another major milestone on our schedule is the execution of our needs solicitation process for FY18. Although you can submit a need at any time, our formal needs collection process runs this year from 1 June until 2 August. (See the "FY18 Needs Solicitation Process Launched" section in this issue of *NESDI News* for more insights.) If you want to submit a need for consideration as part of our FY18 solicitation, you'll have to hurry.

Ken Kaempffe
ken.kaempffe@navy.mil

Successful IPRs Held at FRC Southeast & NPS

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.

At our east coast IPR held in early May at FRC Southeast in Jacksonville, FL, NESDI Principal Investigators highlighted their ongoing efforts to address the persistent and difficult environmental issues facing the Navy. Prior to the start of the east coast IPR, members of the TDWG observed a demonstration of a new engine wash procedure that is the subject of a NESDI project being managed by Keiko Sapp and Kami Downey. The EcoWash™ system does not require the procurement and use of detergent, thereby eliminating purchasing costs and reducing associated hazardous materials management concerns. The TDWG also toured the FRC's plating, painting and fabrication processes.

During the NESDI program's east coast IPR, members of the TDWG and others observed a demonstration of the EcoWash™ engine wash system on one of FRC Southeast's flight lines.

Successful IPRs Held at FRC Southeast & NPS (continued)

The program's west coast IPR was held at NPS in Monterey, CA. Nearly 60 attendees from several different organizations participated in our west coast IPR either in person or over the phone to hear the latest information on a number of our ongoing projects. Among the highlights of the west coast IPR was a presentation by Jeff Paduan, Dean of Research at NPS. During Jeff's presentation, participants were able to identify potential areas of overlap and coordination between NESDI- and NPS-sponsored research.

Final attendee lists and briefings for both 2017 NESDI IPRs are available by contacting Cindy Webber at cynthia.webber@navy.mil and 760-939-2060.

Planning is already underway to hold one of our 2018 IPRs in March at Joint Base Pearl Harbor-Hickam in Honolulu, HI and another IPR in May at the Space and Naval Warfare Systems Command in San Diego, CA. More information will be provided in future issues of *NESDI News*.

NESDI program personnel also had the chance to get a first-hand view of maintenance operations at FRC Southeast.

FY18 Needs Solicitation Process Launched

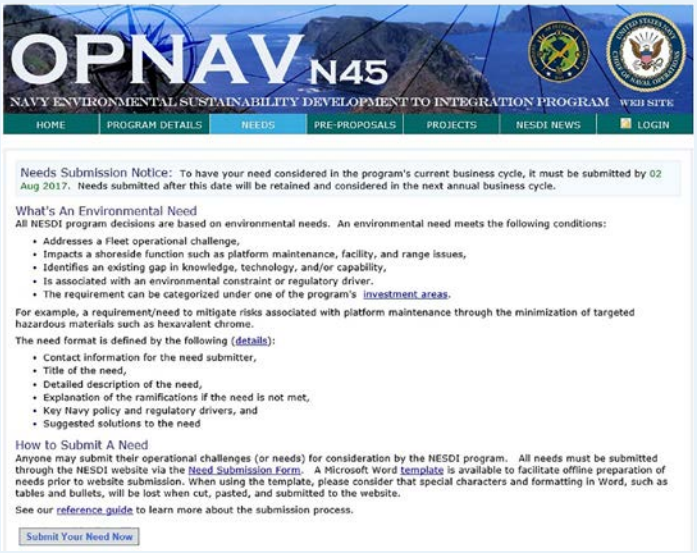
Our formal needs collection process for FY18 runs from 1 June until 2 August. The NESDI program defines a "need" as requirement to eliminate or reduce an environmental constraint that:

1. Addresses a Fleet operational challenge
2. Identifies an existing gap in knowledge, technology, and/or capability
3. Is associated with an environmental constraint or regulatory driver

When submitting a need, we encourage you to provide as much information as you can about your issue. What is the problem? How big is it? What's the basis of the problem? Is it due to a current or impending regulatory requirement that now makes your job more difficult? Is it a technology gap? Is it a fleet operational challenge? Is the problem unique to your facility or is it applicable across the Navy?

Submit your need before 2 August by going to the NESDI web site at its new address (https://epl.navfac.navy.mil/nesdi).

To submit your need, visit the "Needs" section on the NESDI web site then click on the "Submit Your Need Now" button.



This will take you to the "NESDI Environmental Needs Submission Form. Use this form to tell us everything you can about your need. Then click on the "Submit Need" button to complete the process.

Once you submit your need, technical experts assembled by NESDI program management will assess, validate, and rank it. You will be notified about the ultimate status of your need once this ranking process is complete. If you submitted a need in a previous year and it is still a valid need, please resubmit it via our web site and provide any updated information you may have.

For more information, download our *Reference Guide: Submitting and Evaluating Needs* by visiting the NESDI web site at https://epl.navfac.navy.mil/nesdi/Needs.aspx then clicking on the "Needs" banner and then clicking on the "reference guide" hyperlink.

Any other questions about the use of our web site can be directed to Eric Rasmussen, our webmaster, at eric.rasmussen@navy.mil and 732-323-7481.

New Project Initiatives Underway

In this section of *NESDI News*, we introduce you to four more of our newly-initiated projects.

Forward Looking Infrared (FLIR) for Advanced Discharge Characterization (project no. 539)

A mixing zone is an area in a water body immediately adjacent to a discharge outfall. Discharges may result from stormwater or other industrial activities such as cooling water. A mixing zone is defined by the U.S. Environmental Protection Agency (EPA) as an "allocated impact zone where numeric water quality criteria may be exceeded as long as acutely toxic conditions are prevented." Put simply, higher levels of metals and other contaminants are allowed in this zone, with the assumption that they will become diluted within the larger water body.

Hydrodynamic models have been developed to characterize the potential concentrations of contaminants and toxicity of these mixing zones. However, they are not designed to address the issues of dynamic mixing for pierside/nearshore surface discharges (e.g., stormwater mixing).

It is the goal of this project to provide a means to better and more easily quantify and characterize a dynamic mixing zone as well as provide more data for these models through the use of a new technology. This will allow for the better linking of small and large scale hydrodynamic models.

Stormwater outfall.

A FLIR camera can provide thermal imaging of the environment, which can aid in developing highly accurate data associated with outfall discharges. FLIR cameras are currently used for a wide variety of applications, including crop analysis, animal physiology and law enforcement.

The camera records temperature differences between the discharge and ambient water, and its fine scale data resolution can adequately record the mixing patterns in structurally complex pierside regions. A validated model utilizing this technology will enable advanced discharge characterization at Navy facilities to meet National Pollutant Discharge Elimination System requirements.

After calibrating the FLIR camera, the project team will demonstrate the utility of FLIR cameras to capture the dynamics of multiple shoreline discharges, and will incorporate FLIR data into three current hydrodynamic models. EPA supports the use of advanced discharge models that integrate the concepts utilized in this project. Incorporating additional capabilities to the suite of hydrodynamic models currently used by the Navy (Curvilinear-grid Hydrodynamics 3D (CH3D), CORMIX mixing zone, and Dynamic Mixing Zone models) will strengthen support for and adoption of these models.

Principal Investigator:
Brandon Swope
(brandon.swope@navy.mil)

Smart Electronic Tools for Navy Environmental Compliance Monitoring and Reporting (project no. 540)

The Department of the Navy is required by EPA to perform compliance monitoring of Navy activities for 44 programs, including stormwater discharge and spill response. Establishing an efficient compliance program requires collection of massive amounts of data. Comprehensive field surveys of Navy installations require several teams of surveyors, each having varying degrees of experience, note-taking habits, penmanship and very limited time. For example, cross connection surveys (surveys of points where potable and non-potable water sources meet) involve labor-intensive activities including field collection of data, review and manual tabulation of data into spreadsheet or database format, resolving discrepancies in identification of hazard types and identifying corrective actions required. Compilation and interpretation of field notes, manual tabulation of data and consistency checks for hundreds of buildings following these surveys are time-consuming tasks. In addition, handwritten data has to be transferred into a digital format.

Many commercial off-the-shelf technologies exist that assist Public Works Departments in collecting data digitally in the field and transferring it to the work station.

Most field surveys in the Navy are done with pen and paper. (Photo Credit: Mass Communication Specialist Seaman Daniel P. Jackson Norgart)

However, there is an information gap on what electronic devices are acceptable and compatible with the Navy Marine Corps Intranet (NMCI). This project was formed to identify a user-friendly electronic devices and software that are currently NMCI-compatible, or could be certified to be NMCI-compatible.

Principal Investigator:
Itzel Godinez
(itzel.godinez@navy.mil)

New Project Initiatives Underway (continued)

Demonstration of Improved Toxicity Methodology to Link Stormwater Discharges to Receiving Water Impacts at Navy Sites (project no. 547)

The Navy is required to comply with increasingly stringent water quality requirements associated with industrial stormwater discharges. These requirements generally specify end-of-pipe monitoring. However, this type of monitoring is problematic because the exposure conditions at the end-of-pipe are not static. Also, this type of monitoring does not account for the changing magnitude and extent of exposure when contaminants mix in the larger body of water.

One commonly used test method, Whole Effluent Toxicity (WET) testing, was developed to provide a better picture of continuous point source discharges by taking into account factors such as contaminant bioavailability, and some of the complex effects associated with exposure to multiple contaminants, many of which may not be monitored. However, WET methodologies still assume continuous discharges, likely overestimating the toxicity associated with the infrequent and episodic nature of stormwater discharges.

This project plans to identify a more environmentally relevant approach to assessing stormwater toxicity by taking into account actual exposure conditions both at the end-of-pipe and in the receiving water.

The use of pulsed (intermittent) toxicity exposures has been documented in several studies as an effective way to characterize toxicity in water bodies, in part because pulsed exposures are more characteristic of real-world conditions.

The team will gather historical data on rainfall and mixing zone dynamics at several Department of Defense facilities. These data, and the results of other pulsed toxicity studies, will be used to conduct laboratory testing using relevant contaminants of concern and permit-relevant species.

Concurrent end-of-pipe monitoring and in situ water body monitoring will then be initiated, using passive Sediment Ecotoxicity Assessment (SEA) ring samplers. Using the data gathered in the first two steps as a guide, exposures will be varied by time and concentration. The goal is to paint a more accurate, scientifically defensible picture of real-world stormwater discharges and their impact on the water body.

A user's guide will be produced and the development of a final report will be coordinated with the San Diego Regional Water Quality Control Board to seek regulator acceptance of the technology.

Principal Investigator:
Marienne (Molly) Colvin
(marienne.colvin@navy.mil)

Stormwater discharge at the onset of a rain event (left) and less than 24 hours later (right) showing episodic nature of events at end-of-pipe and in the receiving environment. (Photo Credit: Chris Stransky)

Demonstration of Optimized non-NMP (n-Methyl-2-pyrrolidone) Solvents for Immersion Chemical Depainting (project no. 549)

The D-Zolve product without an oil seal, with a 200 milliliter (mL) oil seal, and with a 400 mL oil seal. (Photo Credit: Joseph Santa Maria)

All of the products currently qualified per the MIL-PRF-83936 specification (Remover, Paint, Tank Type, for Aircraft Wheels, Landing Gear Components, and Other Aircraft) contain n-Methyl-2-pyrrolidone (NMP), which is classified as a reprotoxin, due to its detrimental effects on the reproductive system. NMP is a reportable constituent on the Toxic Release Inventory. It is also regulated as a chemical under the California Office of Environmental Health Hazard Assessment and as a European Chemicals Agency Substance of Very High Concern. An alternative non-NMP paint remover is needed.

Efforts are underway through the Defense Logistics Agency's Hazard Minimization and Green Products Program to revise the specification and to perform an initial demonstration of alternative, non-NMP materials to demonstrate acceptable performance. One product (D-Zolve 1533 IM), showed promise in early trials, but raised several concerns: the product evaporated rapidly, was easily removed from the component part and emitted a strong odor. Through leveraged work with the Aircraft Equipment Reliability and Maintainability Improvement Program, the formulation is being optimized for the field application to correct these issues. The reformulated product will also enable the stripping bath temperature to be increased to improve stripping efficiency. Currently, the product is limited to operation at 120 to 125 degrees Fahrenheit because higher temperatures affect additional evaporative losses.

If the reformulated product is suitable, this project will begin with a full demonstration/validation at a Fleet Readiness Center (FRC) to validate its performance and ensure its compatibility with existing infrastructure.

Before the demonstration/validation can take place, the project team will perform coupon tests utilizing small squares or "coupons" of different substrates and various finish systems. The new formula will be compared to a control product that is currently qualified to MIL-PRF-83936. The product will be tested for paint removal performance, corrosion, strip rate, paint adhesion and hydrogen embrittlement. After the coupon testing, scale-up testing will take place at FRC Southeast to demonstrate and validate the new product for stability and aintainability, to establish process controls for quality improvement and to develop engineering documentation.

The non-NMP product will likely be a drop-in replacement for current products because the evaporation retardant will not likely affect the products' properties. In fiscal year 2018, the plan is to revise the applicable technical manuals, Local Process Specifications, general series manuals, or and/or Naval Air Systems Command authorization letters in accordance with the new specification qualifications to prescribe the use of the new chemical at other facilities.

Principal Investigator:
Joseph Santa Maria
(joseph.santamaria@navy.mil)

Program Schedule

Throughout the month of June and beyond, 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 FY17 needs solicitation process. A program schedule for the next year is provided below.

No.	What	When
1.	**Announce FY18 Needs Solicitation**	**1 June 2017**
2.	**Evaluate Full Proposals**	**by 8 June 2017**
3.	**Obtain Sponsor Review & Approval of Full Proposals DUE**	**29 June 2017**
4.	**Announce FY18 New Starts**	**31 July 2017**
5.	**Close FY18 Needs Solicitation**	**2 August 2017**
6.	Screen Needs	7-11 August 2017
7.	Evaluate & Rank Needs	11-15 September 2017
8.	Obtain Sponsor Review & Approval of Needs	18 September - 6 October 2017
9.	Request Pre-proposals	12 October 2017
10.	Conduct OPNAV N45 Programmatic Review	October 2017
11.	Pre-proposals DUE	15 November 2017
12.	Make Pre-proposals Assignments to FWGs	1 December 2017
13.	TDWG & FWG Comments on Pre-proposals DUE	20 December 2017
14.	Evaluate Pre-proposals	8-12 January 2018
15.	Request Full Proposals	18 January 2018
16.	Full Proposals DUE	14 March 2018
17.	Conduct First FY18 In-Progress Review	12-16 March 2018 (Pearl Harbor, HI)
18.	TDWG & FWG Comments on Full Proposals DUE	30 March 2018
19.	Screen Full Proposals	2-6 April 2018
20.	Conduct Second FY18 In-Progress Review	30 April - 4 May 2018 (San Diego, CA)
21.	Principal Investigator Answers to Full Proposal Screening Questions DUE	4 May 2018
22.	Quarterly Status Reports Due	3 July 2017 2 October 2017 8 January 2018 2 April 2018

Check out our web site (https://epl.navfac.navy.mil/nesdi/Schedule.aspx) for the latest version of our program schedule.

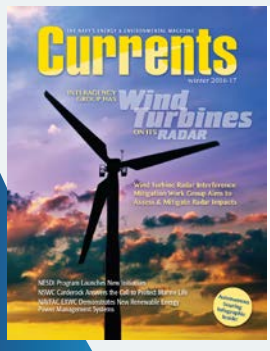
Getting on Our Mailing List

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 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.

No.	Name	Command	Phone	Email
1.	Kaempffe, Ken (Chair)	NAVFAC	805-982-4893	ken.kaempffe@navy.mil
2.	Bixler, Christy	NAVFAC/CNIC	202-685-9313	christy.bixler@navy.mil
3.	Earley, Pat	SPAWAR	619-553-2768	patrick.earley@navy.mil
4.	Harre, Karla	NAVFAC	805-982-2636	karla.harre@navy.mil
5.	Hertel, Bill	NAVSEA	301-227-5259	william.hertel@navy.mil
6.	Kopack, David	NAVSEA	202-781-3247	david.kopack@navy.mil
7.	McCaffrey, Bruce	Consultant	773-376-6200	brucemccaffrey@sbcglobal.net
8.	Mukherjee, Sandi	NAVSUP	717-605-6854	sandi.mukherjee@navy.mil
9.	Rasmussen, Eric	NAVAIR	732-323-7481	eric.rasmussen@navy.mil
10.	Sugiyama, Barbara	NAVFAC	805-982-1668	barbara.sugiyama@navy.mil
11.	Webber, Cindy	NAVAIR	760-939-2060	cynthia.webber@navy.mil
12.	Youngers, Luzmarie	NAVAIR	904-790-6382	luzmarie.youngers@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 summer 2017 issue, we will provide you with updates on our efforts to evaluate and rank the full proposals received via our FY17 solicitation process.

Until then, look for an article about our eleven FY17 "new start" projects in the winter 2016-17 issue of *Currents*, the Navy's energy and environmental magazine. You can read our latest article "NESDI Program Launches Eleven Technology Initiatives" on-line at http://greenfleet.dodlive.mil/currents-magazine.