NESDI News
Highlights & Happenings

SPRING / SUMMER 2021

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 Systems 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 and materials and by filling knowledge gaps to minimize operational environmental risks, constraints and costs while ensuring Navy readiness and lethality.

The NESDI Program:
Integrating Green Technologies Into the Fleet

SPRING / SUMMER 2021

From the Program Manager's Desk

Ken Kaempffe

Welcome to the spring/summer 2021 issue of *NESDI News: Highlights & Happenings*—part of our ongoing effort to keep you informed about 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.

In this issue, we highlight the remaining four of the 14 "new start" projects that we launched at the beginning of FY21, provide you with instructions on how to participate in our FY22 needs solicitation, reveal our proposed FY22 "new start" projects currently under review by the program's resource sponsor (OPNAV N45) and publish a year-out program schedule for your review and consideration.

The next major milestone on our annual schedule is the formal launch of our needs solicitation process that will lead to the formation of "new start" projects in FY23 and beyond.

Although you can submit a need at any time, our formal needs collection process for this year runs until 2 August 2021. (See the "FY22 Needs Solicitation Underway" section in this issue of *NESDI News* for more insights.)

Finally, we have recently submitted to the program's resource sponsor (OPNAV N45) our proposed FY22 "new start" projects for their review and approval. We expect OPNAV N45's review to conclude on 30 July.

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SPRING / SUMMER 2021

Remaining FY21 "New Start" Projects Highlighted

Subject matter experts (SME) from the program's resource sponsor organization (OPNAV N45) approved the 14 entries in the following table as our "new start" projects for FY21.

No.	ID	Submitter	Command	Title
1.	583	James Pilkington	NAVFAC EXWC	Low-Profile Integrated Porous Pretreatment Swale (LIPPS) for Metals Treatment in Industrial Areas
2.	584	Autumn Resto	NAVFAC EXWC	Real-Time Multi-Contaminant Detection System (RMDS)
3.	585	Brandon Swope	NIWC Pacific	High Efficiency Media for Metals Removal in NPDES Discharges
4.	586	Erick Iezzi	NRL	Chrome-free, Low-VOC and Fast-drying Single- and Two-component Primers
5.	587	Itzel Godinez	NAVFAC EXWC	Detection Methodology and Treatment Train Technology for PFAS Removal in Bilge and Oily Wastewater
6.	588	Ron Gauthier	NIWC Pacific	Effluent Copper Quantification by Flow-Through Optical Detection
7.	589	Rob George John Frew	NIWC Pacific	Rapid Pathogen Detection in Drinking and Surface Waters
8.	590	Kami Carter	FRCSE	Dry Ice Paint Removal and Cleaning
9.	591	Joey Trotsky	NAVFAC EXWC	Locating and Quantifying Groundwater Surface Water Connections Using Distributed Temperature Sensing
10.	592	Joey Trotsky	NAVFAC EXWC	Demonstration of the Robust Caisson Structure to Reduce Blast Effects from Underwater Blow-In-Place
11.	593	Jovan Popovic	NAVFAC EXWC	Evaluating Potential Effects to Marine Biota from Small-Scale, Legacy Radioactive Objects
12.	594	Gunther Rosen	NIWC Pacific	Demonstration and Application of Amendments Targeting Comingled Organics and Metals in Sediments
13.	595	Marienne (Molly) Colvin	NIWC Pacific	Demonstration of a Signal Activated Bottom Lander Trap
14.	596	Tony Danko	NAVFAC EXWC	Integrated Analytical Approach to Transition from Active to Passive Treatments at Munitions Sites

The first three projects listed in the above table were highlighted in the fall 2020 issue of *NESDI News*. Projects in rows 4 through 7 were highlighted in our winter 2021 issue.

Projects in rows 8, 9 and 10 are highlighted on the following pages.

SPRING / SUMMER 2021

Remaining FY21 "New Start" Projects Highlighted *(continued)*

Dry Ice Paint Removal and Cleaning (project no. 590)

PRINCIPAL INVESTIGATOR: Kami Carter (FRCSE)

Plastic media blasting (PMB), a type of sandblasting, is the primary blast method for paint and coating removal at Fleet Readiness Centers East, Southeast and Southwest (FRCE, FRCSE and FRCSW). The waste generated from these processes is classified as hazardous waste. At FRCSE alone more than 100,000 pounds of contaminated blast media is disposed of annually, costing the facility more than $185,000 in disposal fees. Glass bead and aluminum oxide media used in mechanical cleaning operations also generate a significant amount of hazardous waste. There is a current need for effective, environmentally friendly, cleaning and stripping processes that create minimal hazardous waste.

The objective of this investigation is to evaluate whether dry ice (carbon dioxide (CO_2)) can be utilized at Fleet Readiness Centers as an effective, environmentally friendly alternative to the use of PMB for cleaning and organic coating removal. Dry ice can be used in a dry and thermal cleaning process that does not create residual blasting media (secondary hazardous waste). At extremely low temperatures, CO_2 changes directly from a solid to a gas in a process called sublimation. When CO_2 pellets are shot from a compressed air source, the combination of kinetic energy and sublimation produces a sandblasting effect.

For this project, two methods will be investigated, both of which utilize the same commercial-off-the-shelf system—the Cold Jet Aero 80. This system offers a variety of pressures and nozzles to optimize dry ice blasting and can be retrofitted with accessories for the purposes of mixed media blasting. The use of dry ice blasting reduces the level of dust and secondary waste generated in traditional blast operations because the blast media itself will evaporate.

Fleet Readiness Center East is one of the facilities that would benefit from CO_2 blasting processes during the maintenance of the F-35 Lightning and other Navy aircraft programs. (Photo Credit: Heather Wilburn)

Remaining FY21 "New Start" Projects Highlighted *(continued)*

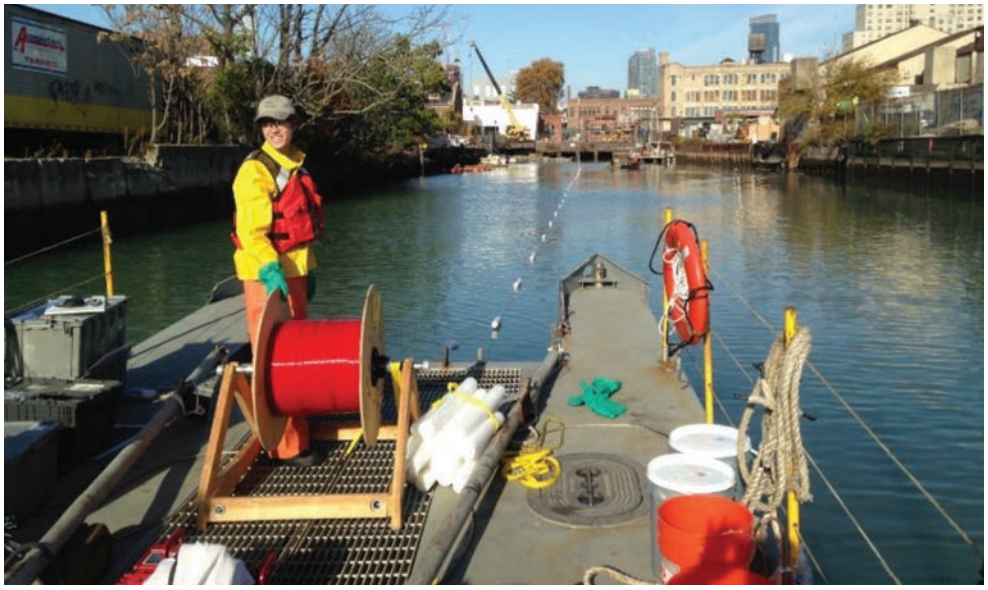
Locating and Quantifying Groundwater Surface Water Connections Using Distributed Temperature Sensing (project no. 591)

PRINCIPAL INVESTIGATOR:
Joey Trotsky (NAVFAC EXWC)

The identification and migration of contaminated groundwater into surface water is a priority among Remedial Program Managers (RPM). Traditional sampling methods to identify and quantify groundwater seepage involve measurements at a few discrete locations. These methods provide limited information because seepage may occur to varying degrees over a large area. Better methods that provide data that are more complete are needed to improve the characterization of groundwater movement and associated contaminant transport in order to support decision-making for potential remedial actions.

The objective of this study is to demonstrate the capability of a distributed temperature sensing (DTS) system to provide high resolution identification of seepage locations at a relevant Navy site. Temperature differences have been used extensively as tracers to track groundwater-to-surface water discharge—areas of lower temperature indicate groundwater discharge zones. Fiber optic DTS technology uses the relationship between temperature and scattered light in a fiber optic cable to measure temperatures continuously. The cable may be several kilometers in length, allowing continuous measurement at thousands of locations.

Analytical tools allow for the processing of these data into a detailed view of temperature differential (representing groundwater seepage) over time, including variations with tide level, precipitation events and/or pumping.



Deployment of the distributed temperature sensing system. (Photo Credit: Joey Trotsky)

Remaining FY21 "New Start" Projects Highlighted *(continued)*

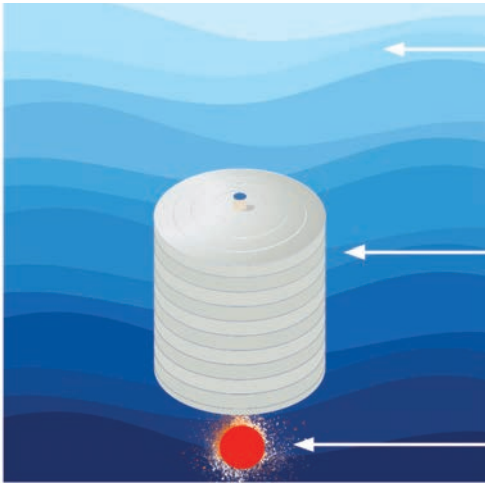
Demonstration of the Robust Caisson Structure to Reduce Blast Effects from Underwater Blow-In-Place (project no. 592)

PRINCIPAL INVESTIGATOR: Joey Trotsky (NAVFAC EXWC)

Underwater munitions represent a significant threat due to potential incidental contact with recreational users. Current procedures, known as blow-in-place, detonate the underwater munition, which can result in blast pressures that are detrimental to nearby structures and marine life. Technologies are needed to cost effectively and safely recover munitions in the underwater environment. This project is field testing the effectiveness of a robust caisson structure to reduce blast effects from underwater explosions.

A caisson is a secure, watertight chamber usually used for underwater construction. The chamber is made waterproof through the addition of compressed air. The use of a caisson as a blast shield was studied under a Strategic Environmental Research and Development Program (SERDP) project no. MR-2648 "Modeling a Robust Caisson Structure to Resist Effects from Blow-In-Place of Underwater Unexploded Ordnance." Computer simulations found that the robust caisson structure (RCS) model developed by the SERDP team was able to significantly reduce the effects of underwater explosions.

The innovative design of the RCS splits the total blast wave energy into multiple smaller, weaker shock waves that travel at different speeds, resulting in much lower blast peak pressures and impulses. This project was formed to fabricate and demonstrate a full-scale RCS based on the original SERDP design.



This NESDI project will field test the effectiveness of a robust caisson structure to reduce blast effects from underwater explosions. (Diagram Credit: Joey Trotsky)

The remaining four "new starts" in the table on page 3 will be highlighted in the fall 2021 issue of *NESDI News*.

Proposed FY22 "New Start" Projects Under Review

The TDWG has recently submitted its proposed FY22 "new start" projects for review and approval by the program's resource sponsor (OPNAV N45). The OPNAV N45 review is currently underway and is planned to conclude on 30 July. All of the 23 proposals received this year were of exceptional quality—making the final funding decision especially difficult.

We will award as many FY22 "new starts" as our budget will allow. Other, lower priority proposed efforts will be kept in play as possible FY23 "new starts." As such, we have divided the proposals into three phases in order of priority assigned by our TDWG and currently under review by OPNAV N45.

The following eight efforts will be funded as the program's FY22 "new starts" pending OPNAV N45 approval and confirmation of the availability of funds:

1. Minimizing Hazardous Waste from Expired Paints and Associated Solvents from Ships Supply
2. Characterization of Antifouling Paint and Environmental Loading with Navy Dome System (CHROME DOME)
3. Electromagnetic Interference Shielding Tape (EMIST)
4. Initiation Decision Report (IDR) for Addressing Opportunistic Premise Plumbing Pathogens at Navy Installations
5. Advanced Anodize Repair
6. Chronic Toxicity and Bioaccumulation Evaluation of Multiple PFAS for Benthic and Pelagic Species Relevant to Marine Ecological Risk Assessment
7. Remotely Operated Oil Spill Response Equipment: Down-Selection and Demonstration at a Navy Port
8. Closed Loop, In Situ Soil Flushing at PFAS-Impacted Source Zones

Based on the availability of funding, the program has another six proposals in phase 2 and nine proposals in phase 3. These efforts may be awarded if funding becomes available and/or launch some of these efforts as FY23 "new start" projects. Currently the program intends to announce a final decision regarding FY22 "new starts" by 13 August.

Final IPR of the Year Held

Due to the travel restrictions put in place to mitigate the spread of the coronavirus, the program's three IPRs in FY21 were held "virtually" in lieu of face-to-face meetings. Our final IPR for FY21 was held 8-9 June and concentrated primarily on briefings of projects being led by investigators from the Naval Information Warfare Center (NIWC) Pacific in San Diego, CA. Over eight dozen personnel from across the country participated in all three of our FY21 IPRs that highlighted progress being made by all NESDI Principal Investigators who delivered briefings on 47 projects in all—13 "new start" projects, 26 ongoing projects and eight final briefings on projects that were completed and are now closed out. Information about our FY22 IPRs will be provided in future issues of *NESDI News* as that schedule is set.

SPRING / SUMMER 2021

FY22 Needs Solicitation Underway

Our formal needs collection process for FY22 is underway—running from 1 June until 2 August 2021. The NESDI program defines a "need" as a requirement to eliminate or reduce an environmental constraint that:

1. Addresses an 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 an operational challenge? Is the problem unique to your facility or is it applicable across the Navy?

To submit your need by 2 August 2021, go to the NESDI website at https://epl.navfac.navy.mil/nesdi then select the "Needs" button.

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 website and provide any updated information you may have.

For more information, download our Reference Guide: Submitting and Evaluating Needs by visiting the NESDI website 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 website can be directed to Eric Rasmussen, our webmaster, at eric.rasmussen@navy.mil and 732-323-7481.

To submit your need by 2 August 2021, go to the NESDI website at https://epl.navfac.navy.mil/nesdi then select the "Needs" button.

Program Schedule

Throughout the summer and into the fall, the NESDI program will be focused on obtaining approval from OPNAV N45 SMEs on our proposed FY22 "new start" projects and launching our FY23 needs solicitation. An entire program schedule for the next year is provided below.

No.	What	When
1.	Close FY22 Needs Solicitation	2 August 2021
2.	Screen FY22 Needs	9 – 13 August 2021
3.	Announce FY22 New Starts	13 August 2021
4.	Evaluate & Rank Needs	13 – 17 September 2021
5.	Obtain Sponsor Review & Approval of Needs	20 September – 22 October 2021
6.	Request Pre-proposals	1 November 2021
7.	Pre-proposals DUE	16 December 2021
8.	TDWG Comments on Pre-proposals DUE	14 January 2022
9.	Evaluate Pre-proposals	17 – 21 January 2022
10.	Request Full Proposals	21 January 2022
11.	Conduct OPNAV N45 Programmatic Review	November/ December 2021
12.	Full Proposals DUE	10 March 2022
13.	Screen Full Proposals	28 March – 1 April 2022
14.	Conduct First FY22 In-Progress Review	26–28 April 2022
15.	Principal Investigator Answers to Full Proposal Screening Questions DUE	22 April 2022
16.	Conduct Second FY22 In-Progress Review	3 – 5 May 2022
17.	TDWG Comments on Full Proposals DUE	17 May 2022
18.	Complete Evaluation of Full Proposals	20 May 2022
19.	Obtain Sponsor Review & Approval of Full Proposals	30 May – 29 July 2022
20.	Announce FY23 Needs Solicitation	1 June 2022
21.	Conduct Third FY22 In-Progress Review	7 – 9 June 2022
22.	Quarterly Status Reports Due	5 July 2021 4 October 2021 3 January 2022 4 April 2022

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

SPRING / SUMMER 2021

NESDI News
Highlights & Happenings

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If you're not already on our mailing list and want to subscribe to *NESDI News*, please send your email address to Eric Rasmussen at eric.rasmussen@navy.mil.

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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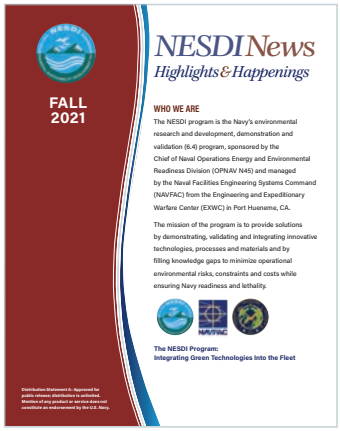

IN THE NEXT ISSUE OF *NESDI News*

There is a lot more information coming your way in the next issue of *NESDI News: Highlights & Happenings.* In our fall 2021 issue, we will provide you with updates on the status of our proposed FY22 "new start" projects and FY22 needs solicitation.