



**FALL 2021/
WINTER 2022**

INSIDE THIS ISSUE:

Remaining FY21
"New Start"
Projects Highlighted 3

FY22 "New Start"
Projects Announced 7

FY22 Needs
Evaluation Underway 8

EXWC Personnel
Receive Patent for
LIPPS Technology 8

NAVSUP WSS Wins
SECDEF Award
for Sustainability 9

NESDI News

Highlights & Happenings

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**



FALL 2021/
WINTER 2022

From the Program Manager's Desk



Ken Kaempffe

Welcome to the fall 2021/winter 2022 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, reveal our proposed FY22 “new start” projects that were reviewed and approved by the program’s resource sponsor and publish a year-out program schedule for your review and consideration.

Due to budget constraints and COVID-19 impacts to existing projects, the NESDI program will not be soliciting for proposals this year. We intend to award FY23 “new start” projects from the FY22 hold over proposals. We expect to execute our standard process in FY23 that will result in “new starts” in FY24 and beyond.

Ken Kaempffe
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FALL 2021/
WINTER 2022

Remaining FY21 “New Start” Projects Highlighted

Subject matter experts from the program’s resource sponsor 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 Optical or Voltammetric Detection and Analysis
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	Marianne (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 and projects in rows 8, 9 and 10 were highlighted in our spring/summer 2021 issue. The remaining four projects (in rows 11-14) are highlighted on the following pages.



FALL 2021/
WINTER 2022

Remaining FY21 “New Start” Projects Highlighted *(continued)*

Evaluating Potential Effects to Marine Biota from Small-Scale, Legacy Radioactive Objects (project no. 593)

PRINCIPAL INVESTIGATOR:
Jovan Popovic (NAVFAC EWXC)

Discrete radioactive particles are small, usually microscopic, radioactive particles that are sometimes found in the marine environment at Department of Navy locations. These particles were usually lost from Navy ships, such as radium painted dials or paint chips, prior to the present day understanding and control of radiological materials. Though the effects of discrete radioactive material (RAM) are not well understood, such particles can become lodged in living tissue and have the potential to affect the food chain.



Radium painted dials like the one on this ship's clock can contain small, usually microscopic, radioactive particles and are sometimes found in the marine environment at Department of Navy locations.

(Photo Credit: Jovan Popovic)

Current practices to remediate sites with discrete RAM involve removal of the material, which can incur significant costs and project delays. Knowledge regarding the detrimental effects of discrete RAM on the marine biota is a necessary first step toward informed remediation. This project was formed to evaluate the potential for detrimental effects on marine biota of small-scale objects containing radioactive material relevant to the U.S. Navy.

Demonstration and Application of Amendments Targeting Comingled Organics and Metals in Sediments (project no. 594)

PRINCIPAL INVESTIGATOR:
Gunther Rosen (NIWC Pacific)

Contaminated sediment remediation represents a \$2 billion liability for the Navy. Though activated carbon has proven effective as an in situ amendment for addressing sediments with organic contaminants, a remedy that addresses comingled organics and metals contamination is needed.

Several amendments for addressing metal-contaminated sediments are emerging, including various metal oxides and clays. Metal oxide-modified activated carbon is a promising treatment for addressing sediments contaminated with comingled metals and organics. However, none of these remedies have been field tested in real-world environments similar to Navy sites.



FALL 2021/
WINTER 2022

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

The objective of this work is to demonstrate and validate performance, placement and stability following placement of reactive amendments for in situ treatment of comingled organic and metal contaminated sediments at Navy facilities.



AquaGate+ reactive amendment media.

(Photo Credit: Scott Collins)

AquaGate+ amendments being deployed at a Navy site. (Photo Credit: Courtesy of ESTCP project no. ER-201131)

Demonstration of a Signal Activated Bottom Lander Trap (project no. 595)

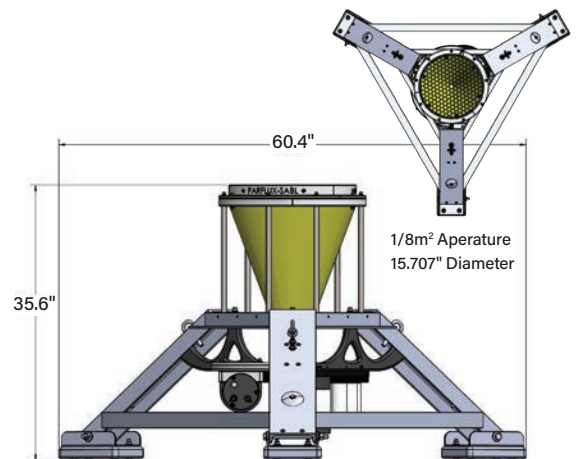
PRINCIPAL INVESTIGATOR:
Marienne (Molly) Colvin
(NIWC Pacific)

Determining the sources of sediment contamination in Navy harbors is a complicated endeavor. In addition, sites that have been identified for remediation often become recontaminated over time due to various environmental factors. Most contaminated sediment sites currently use

sediment trap technology: passive, diver-deployed, cylindrical traps that capture particles as they settle to the seafloor. As these traps are passive and always open to the environment, they cannot distinguish between actual depositions associated with specific temporal particle discharge events (such as storms, dredging projects, ship activities, etc.) versus local resuspension that might be associated with bottom erosion (i.e., tidal influences).

There is an ongoing need for technologies that would more accurately evaluate sources of particulate deposition to better evaluate potential contamination and recontamination of sediments.

The objective of this project is to develop and demonstrate an automated technology that can aid sediment remediation efforts by targeting specific particle discharge or resuspension events.



This project is demonstrating a technology that can aid sediment remediation efforts by targeting specific particle discharge or resuspension events. (Schematic Credit: Courtesy of McLane Research Laboratories)



FALL 2021/
WINTER 2022

Remaining FY21 “New Start” Projects Highlighted *(continued)*

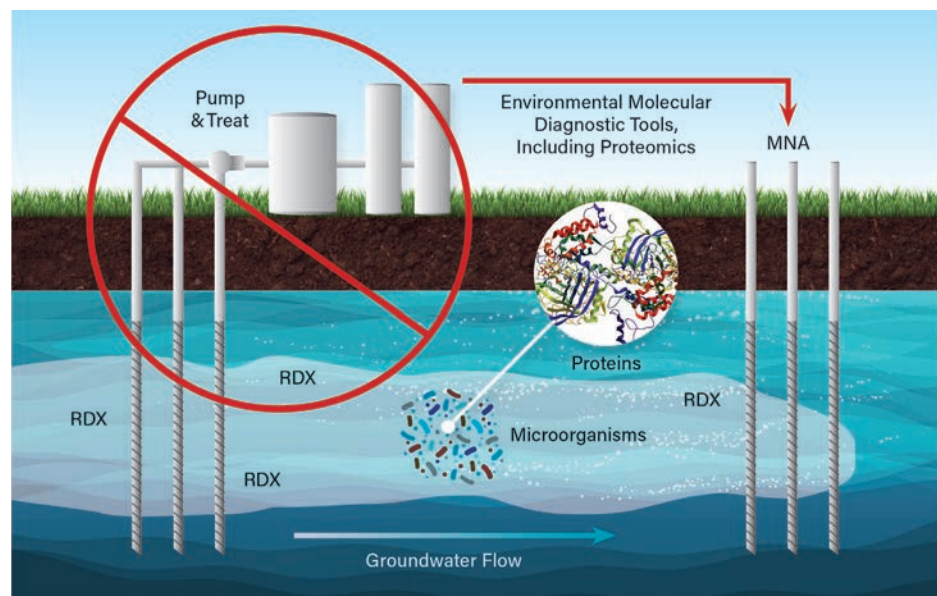
Integrated Analytical Approach to Transition from Active to Passive Treatments at Munitions Sites (project no. 596)

**PRINCIPAL INVESTIGATOR:
Tony Danko (NAVFAC EXWC)**

The Navy has over 400 sites in need of remediation due to remnants of munitions (munitions constituents). Approximately 70 of these sites are currently being treated with pump and treat systems, which means that contaminated groundwater is pumped out of the soil and treated aboveground. Remedial Program Managers (RPM) need a formalized framework to determine when pump and treat activities (active remediation) can be ceased and the next phase (passive remediation) begun.

This project is developing a protocol to ease transition from active to passive remediation at Navy sites contaminated with munitions constituents.

This project team is combining compound-specific isotopic analysis (CSIA) with molecular biological tools to identify degradation potential of munitions constituents at Naval Base Kitsap – Bangor, which is an active remediation site. The resultant protocols can be transferred to a variety of environmental contaminants, including RDX. The process will be incorporated into Naval Base Kitsap – Bangor’s adaptive management plan, which will formalize a versatile cleanup strategy developed in conjunction with regional representatives from the EPA.



(Diagram Credit: Tony Danko)

Fact sheets for the above and other NESDI projects can be found on the program’s public website at www.navfac.navy.mil/nesdi.



FALL 2021/
WINTER 2022

FY22 “New Start” Projects Announced

The following eight efforts will be launched as the program’s FY22 “new start” projects:

No.	Project No.	Title	Principal Investigator	Performing Agency
1.	597	Remotely Operated Oil Spill Response Equipment: Down-Selection and Demonstration at a Navy Port	Dan Bojorquez	NAVFAC EXWC
2.	598	Minimizing Hazardous Waste from Expired Paints and Associated Solvents from Ships Supply	Todd Heintzelman	NAVSUP WSS
3.	599	Pathways for Addressing Opportunistic Premise Plumbing Pathogens at Navy Installations	Autumn Resto	NAVFAC EXWC
4.	600	Advanced Anodize Repair	Alexander Westbrook	NAVAIR NAWC AD Pax River
5.	601	Chronic Toxicity and Bioaccumulation Evaluation of Multiple PFAS for Benthic and Pelagic Species Relevant to Marine Ecological Risk Assessment	Nicholas Hayman	NIWC Pacific
6.	602	Closed Loop, In Situ Soil Flushing at PFAS-Impacted Source Zones	Jovan Popovic	NAVFAC EXWC
7.	603	Characterization of Antifouling Paint and Environmental Loading with Navy Dome System (CHROME DOME)	Ignacio Rivera	NIWC Pacific
8.	604	An Integrated Navy Approach to Estimate Risk and Cleanup Goals for Radionuclides Associated with Buildings at Current and Former Navy Installations	Kenda Neil	NAVFAC EXWC

These projects will be highlighted in subsequent issues of *NESDI News*.



FALL 2021/
WINTER 2022

FY22 Needs Evaluation Underway

Our formal needs collection process for FY22 is complete. Members of the program's TDWG assessed, validated and ranked all of the 18 needs listed in the table below.

No.	Need	Title
1.	N-1395-22	Assessing Water Resources Supply and Security Vulnerabilities at Navy Installations
2.	N-1396-22	Real-Time Tracking for Hazardous Waste Containers
3.	N-1399-22	Determine Effectiveness of Foam Reduction Products in Field Conditions
4.	N-1400-22	PFAS Treatment in Various Environmental Media
5.	N-1401-22	Evaluating and Demonstrating Alternative Oil Boom Cleaning Technologies
6.	N-1402-22	Non-Chrome Direct-to-Metal Conductive Polymer Primer with Reactive Corrosion Inhibitors
7.	N-1403-22	Equilibrium Passive Sampler for Monitoring of PFAS in Sediment Porewater & Surface Water
8.	N-1404-22	Ex Situ Treatment of PFAS-contaminated Soil and GAC
9.	N-1405-22	Innovative Approaches to Support Closure of Petroleum-Impacted Sites
10.	N-1406-22	Use of Passive Sampling for Assessment of Bioavailable PFAS in Surface Water and Porewater
11.	N-1407-22	Cost-Effective Engineered Natural Treatment System for PFAS Removal from Groundwater and Surface Water
12.	N-1409-22	Non-Paste Methods to Determine Water Levels in UST/ASTs
13.	N-1410-22	Improving POL Spill Clean-Up
14.	N-1412-22	Bay Silt Dewatering and Disposal
15.	N-1413-22	PFAS in Biosolids Study at NAVFAC Hawaii
16.	N-1414-22	Evaluating and Demonstrating Alternative On-Water Oil Spill Skimming /Removal Technologies
17.	N-1415-22	Modeling Potential Impacts of Climate Change on Remedy Effectiveness and Long-term
18.	N-1416-22	Subsurface Monitoring of Complex Groundwater Dynamics Driven by Climate Change

Need submitters will be notified about the ultimate status of their need once this evaluation and ranking process is complete.

These needs will be retained by the program and evaluated at the end of FY22. Proposals to address approved needs will be solicited in FY23 and beyond.



FALL 2021/
WINTER 2022

EXWC Personnel Receive Patent for LIPPS Technology

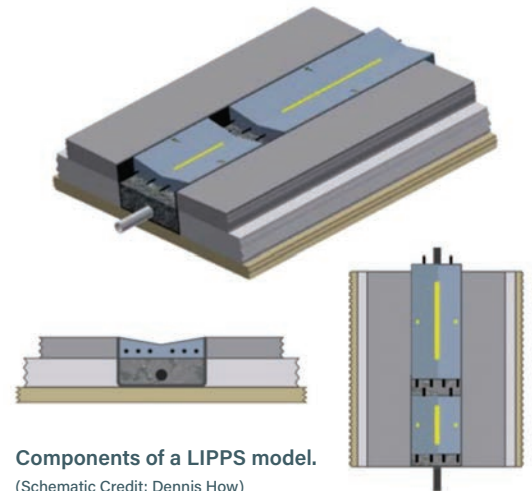
Modular Porous Swale Filtration System

Patent No.: US 10899,633 B1

Date: 26 January 2021

Three EXWC engineers were granted a patent for a modular porous swale filtration system. As is stated in the patent, “Industrial and commercial sites may allow stormwater runoff to flow into a water retention area, body of water or a processing facility. Toxic metals, suspended solids and other pollutants, however, flow from the stormwater runoff and can lead to pollution of waterways. Industrial sites that operate and maintain ships, aircraft and vehicles, for example, are generally prone to high levels of pollutants in their stormwater. Additionally, facilities that galvanize sheathed materials (siding or roofing, for instance) or otherwise coated with paints containing copper and zinc may also leach significant levels of toxic metals into the environment. In that regard, it is desirable to have an efficient and cost-effective apparatus that can remove toxic metals and suspended solids from storm water runoff.”

A current NESDI project (no. 583: Low-profile Integrated Porous Pretreatment Swale (LIPPS) for Metals Treatment in Industrial Areas) being led by James Pilkington, NAVFAC EXWC) is refining the original design as described in the patent and conducting a physical demonstration of a passive, industrial, low-profile and innovative stormwater management solution (the LIPPS) that will allow users to target and treat specific pollutants of concern and operate in multiple platforms.



Components of a LIPPS model.
(Schematic Credit: Dennis How)

For more information about this patent, visit
[https://pdfpiw.uspto.gov/.piw?PageNum=0&docid=010899633
&IDKey=&HomeUrl=http%3A%2F%2Fpdfpiw.uspto.gov%2F](https://pdfpiw.uspto.gov/.piw?PageNum=0&docid=010899633&IDKey=&HomeUrl=http%3A%2F%2Fpdfpiw.uspto.gov%2F)



FALL 2021/
WINTER 2022

|| NAVSUP WSS Wins SECDEF Award for Sustainability

The Department of Defense announced the Naval Supply Systems Command Weapon Systems Support (NAVSUP WSS) as the winner of the 2021 Secretary of Defense Environmental Award in the Sustainability Individual/Team category.

NAVSUP WSS formed a multifunctional team to develop the Navy's Enterprise-Wide Hazardous Materials Standardization and Minimization of General Use Consumables project and conducted pilots to demonstrate that U.S. Navy installations could increase the purchase of more environmentally friendly hazardous materials substitutions using new tools and procedures. The team received additional support from the NAVSUP Business Systems Center who helped develop a hazardous material management web tool to standardize hazardous materials data-management processes across the enterprise and provide NAVSUP customers with valuable access to Navy Enterprise Resource Planning data leveraging NAVSUP's Navy Data platform.

For more information about this award, visit <https://www.dvidshub.net/news/399646/navsup-wss-earned-secretary-defense-environmental-award-sustainability>.

A NESDI project led by Principal Investigator Todd Heintzelman, (project no. 556: Enterprise-wide Hazardous Material Standardization and Minimization of General Use Consumables) is developing a process to standardize the procurement of consumable general use hazardous materials, create tools to guide end users of hazardous materials to procure less hazardous products. This project was also designated as a Safer Choice Partner of the Year by the U.S. Environmental Protection Agency (EPA).

Congratulations to the NAVSUP WSS team on these awards!

For more information, visit <https://www.dvidshub.net/news/399646/navsup-wss-earned-secretary-defense-environmental-award-sustainability>.



FALL 2021/
WINTER 2022

Program Schedule

An entire program schedule for the next year is provided below.

No.	What	When
1.	Conduct Programmatic Review with NAVFAC Headquarters and OPNAV N45	29–30 November 2021
2.	Conduct First FY22 In-Progress Review	26–28 April 2022
3.	Conduct Second FY22 In-Progress Review	3–5 May 2022
4.	Announce FY23 Needs Solicitation	1 June 2022
5.	Conduct Third FY22 In-Progress Review	7–9 June 2022
6.	Close FY23 Needs Solicitation	1 August 2022
7.	Screen FY23 Needs	22–26 August 2022
8.	Evaluate & Rank Needs	12–16 September 2022
9.	Obtain Sponsor Review & Approval of Needs	19 September – 21 October 2022
10.	Quarterly Status Reports Due	3 January 2022 4 April 2022 5 July 2022 3 October 2022



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



FALL 2021/
WINTER 2022

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.

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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 2022 issue, we will provide you with updates on the launching of our most recent set of “new start” projects.