



YEAR IN REVIEW

Mission Readiness,
Environmental Stewardship:
A Review of 2025

MISSION OF THE NESDI PROGRAM

The mission of the NESDI program is to support Fleet readiness by minimizing operational constraints associated with environmental and human health risks and to reduce cost of environmental compliance by demonstrating, validating, and integrating innovative technologies, processes, materials, and by filling knowledge gaps. The program seeks to accomplish this mission through the evaluation of cost-effective technologies, processes, materials and knowledge that enhance environmental readiness of naval shore activities.

The NESDI program is the Navy's environmental shoreside Research, Development, Test & Evaluation (RDT&E) program. The NESDI technology demonstration and validation program is sponsored by Office of the Chief of Naval Operations (OPNAV) Compliance and Mission Readiness (N4I1) and managed by the Naval Facilities Engineering Systems Command (NAVFAC) out of the Engineering and Expeditionary Warfare Center (EXWC) in Port Hueneme, CA.



AVAILABLE FOR DOWNLOAD AT:

<https://epl.navfac.navy.mil/nesdi> (CAC enabled)

<https://exwc.navfac.navy.mil/nesdi> (public site)

Distribution Statement A: Approved for public release; distribution is unlimited.

Mention of any product or service in this Year in Review report does not constitute an endorsement by the U.S. Navy.



INTRODUCTION

Welcome to the Navy Environmental Sustainability Development to Integration (NESDI) Program Fiscal Year (FY) 2025 Year in Review report. As the Navy's environmental technology demonstration and validation program, NESDI strives to remain at the forefront of emerging technologies and innovative methodologies that advance environmental assessments and solutions.

By identifying, funding, and transitioning tools and approaches that strengthen environmental compliance and operational sustainability, we help ensure the Fleet and shore installations can meet mission requirements while protecting our environment. Your engagement and collaboration continue to drive our success, and we look forward to another year of impactful achievements together.

A WORD FROM THE NESDI PROGRAM MANAGER

As the NESDI Program Manager, I'm excited to share the accomplishments of FY25 with you. This year has been a remarkable one for the program, showcasing our resolute commitment to advancing environmental sustainability as a direct enabler of the Navy's warfighting mission. By working closely with our stakeholders, investing in innovative research, and focusing on strategic priorities, we've made significant strides in addressing some of the Navy's most pressing environmental challenges.

FY25 was a year of progress and momentum. We launched seven new start projects and successfully wrapped up eleven others, demonstrating our proactive approach to tackling emerging environmental issues. These efforts ensure the Navy stays ahead of regulatory requirements and operational constraints that could otherwise impact mission readiness. For example, developing safer, non-methylene chloride paint strippers not only protects our environment but directly enhances the safety and health of our sailors and maintenance crews by reducing their exposure to hazardous chemicals. These are practical, cost-effective solutions that benefit the Fleet. None of this would have been possible without the expertise of our project teams, the guidance of our resource sponsor, OPNAV N411, and the support of stakeholders across the Navy.

Together, we've achieved milestones that go beyond compliance, they strengthen operational efficiency and sustainability. Projects focused on



PFAS and stormwater management ensure our bases and training ranges can continue to operate without restriction, preserving our freedom of action.

This year also brought significant contributions to the broader scientific community. We delivered 33 presentations, filed seven patent applications, and published two peer-reviewed papers, all of which are critical to transitioning validated solutions into operational use. On top of that, projects like Extending the Shelf-Life of Aircraft Sealants have delivered tangible benefits. This does more than save money; it reduces the logistical footprint in deployed environments and ensures our maintainers have the critical materials they need to keep aircraft mission capable. Our partnership with Puget Sound Naval Shipyard has been especially impactful, allowing us to demonstrate new technologies like the Signal Activated Bottom Lander (SABL) sediment trap, which provides precise data for managing sediment contamination.

Looking ahead, I'm confident that NESDI will continue to play a vital role in supporting Fleet readiness by identifying, funding, and transitioning technologies that enhance environmental compliance and operational sustainability. I want to thank everyone who contributed to the program's success this year. Your hard work, collaboration, and dedication are what make this program thrive. I'd also like to extend a special thank you to Rachel Methvin, our outgoing sponsor representative, for her steadfast partnership. As we welcome Ben Colbert to the team, I'm excited to continue building on this momentum together. Here's to another year of impactful progress!

Clayton Ferguson

Program Manager

clayton.w.ferguson2.civ@us.navy.mil



TABLE OF CONTENTS

Mission of the NESDI Program	2
Introduction	3
A Word from the NESDI Program Manager	3
Table of Contents.....	5
The Numbers	7
Types of Investments	8
NESDI Customers	10
The NESDI Program Process	11
Project Metrics	13
Patents.....	14
Peer Reviewed Publications	15
Presentations	16
Connecting NESDI-Funded Projects: A Look at FY2025 Stakeholder & End-User Engagement.....	17
FY26 “New Start” Projects.....	18
Demonstration and Application of Amendments for PFAS In-situ Stabilization in Sediments (Project no. 637)	19
Determining BMP Efficacy for Tire Wear Particle Discharge at Navy Facilities (Project no. 638)	20
Aerospace Class N Primer Crack Initiation Validation and Inner Mold-Line (IML) Demonstration for Authorization (Project no. 639).....	20
Methodology to quantify PFAS distributions in precipitation, ambient air and ambient soils at multiple Navy installations (Project no. 640)	21
Quantifying PFAS Background Levels within DoN Installations (Project no. 641)	21
Alternative non-Methylene Chloride Paint Strippers (Project no. 642)	22
Navy Support Equipment Deployed Aviation HAZMAT List (Project no. 643)	22
FY25 Project Accomplishments	23



In-Pipe Stormwater Treatment Unit (I-STUB) (Project no. 576)24

Low-Profile Integrated Porous Pretreatment Swale (LIPPS) (Project no. 583)24

Demonstration of a Signal Activated Bottom Lander (SABL)Trap (Project no. 595).....25

Assessing emerging chemicals of concern and loading from Navy industrial surfaces (Project no. 629)25

Project Closeouts..... 27

Promoting Our Success..... 28

For More Information..... 29

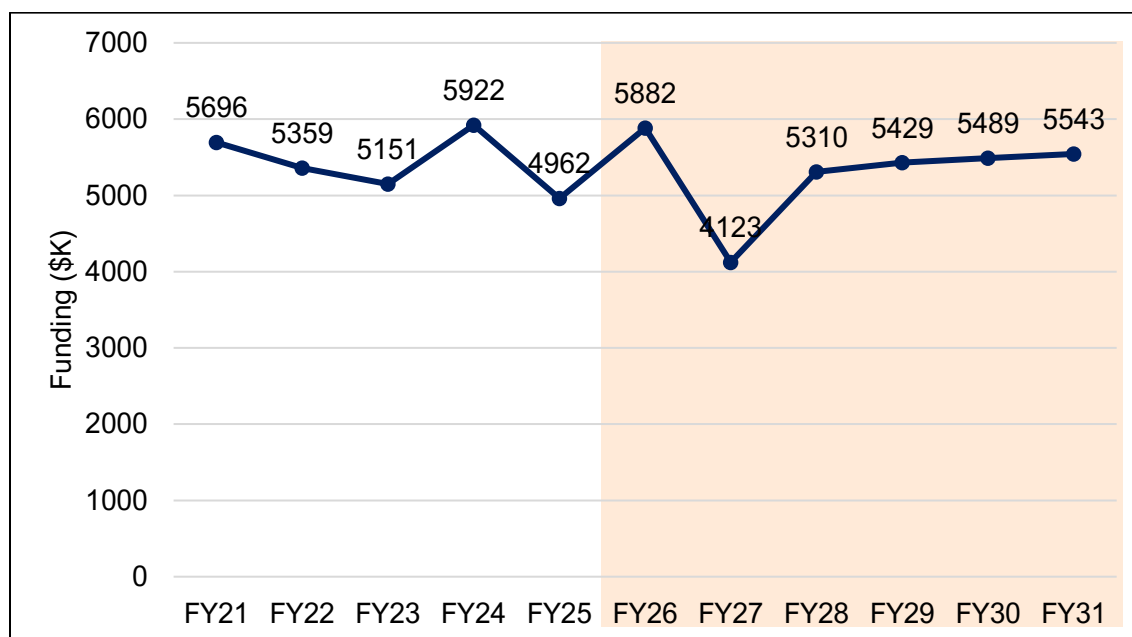


THE NUMBERS

Each year, the NESDI program strategically allocates its investments to address high-priority requirements identified by warfighters and support personnel across the Navy, ensuring our efforts are directly aligned with operational needs. These priorities are shaped not only by day-to-day environmental compliance demands, but also by anticipated and emerging risks that could directly impact mission readiness from training exercises to deployed operations.

Central to this process is NESDI's commitment to delivering technologies that give our warfighters an edge. Funding decisions are guided by technical merit, direct operational relevance, and the potential for broad Fleet-wide impact, with a focus on accelerating the transition of innovative tools from the lab into the hands of the sailor, aviator, and maintainer. By doing so, the program delivers capabilities that improve environmental performance, increase efficiency, and reduce mission risk by keeping our ships, aircraft, and shore facilities in the fight.

The chart below illustrates the program's funding trajectory from Fiscal Year (FY) 2021 through FY 2025, as well as projected allocations for FY 2026 through FY 2031. While these future projections provide a roadmap for planning, they remain adaptable to shifts in mission priorities, new regulatory drivers, technological advancements, and broader budgetary considerations. This flexibility ensures that the NESDI program can remain agile and responsive, ready to tackle the next environmental challenge that could threaten to sideline a critical asset or training range. This mission-focused approach ensures every dollar is invested in sustaining our warfighting advantage.



TYPES OF INVESTMENTS

ADAPTING CAPABILITIES FOR FUTURE MISSION READINESS

The NESDI program continues to encompass a broad spectrum of environmental research and technology development, organized into distinct Environmental Enabling Capabilities (EECs) that align with the Navy's mission priorities. These efforts are directly in line with the priorities of the 34th CNO, Admiral Daryl L. Caudle, by protecting our Sailors ("Foundry"), ensuring operational readiness ("Fleet"), and modernizing the force ("Flight").

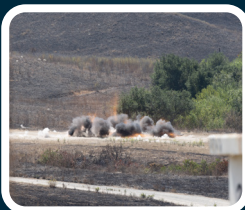
While the historical portfolio concentrated on Regulatory & Base Operations, which address high-impact environmental issues such as legacy contaminants and stormwater, the latest projects demonstrate a sharpened strategic focus across critical areas. Significant new investment is directed at developing groundbreaking destructive technologies for Per- and polyfluoroalkyl substances (PFAS) and assessing emerging chemicals of concern. This work reinforces the Navy's commitment to compliance and environmental stewardship which is foundational to the "Fleet" priority by ensuring our bases and training ranges remain ready and available, while addressing new challenges like coastal resiliency and natural hazards within Air & Port Operations.

Beyond core base operations, NESDI is strategically advancing Weapon System Sustainment by tackling hazardous material replacement. New projects are focusing on alternatives to highly toxic substances like hexavalent chromium and cadmium, ensuring operational sustainability and directly support the "Foundry" priority by enhancing warfighter safety in maintenance and logistics. Similarly, efforts in Air & Port Operations are enhancing environmental monitoring near mission-critical infrastructure through the validation of autonomous multi-sensor systems and evaluating the long-term resilience of restoration efforts against natural hazards/disasters, contributing to the "Flight" priority by modernizing how we protect and sustain mission-critical infrastructure.

Through these diverse capability areas, the NESDI program delivers solutions that protect mission readiness, adapt to evolving environmental challenges, from legacy groundwater sites to next-generation contaminant destruction, and maintain the Navy's leadership in sustainable and safe operational practices, turning the CNO's strategic vision into tangible results for the warfighter.



TYPES OF INVESTMENTS (CONTINUED)



Range Sustainment

Mitigate environmental impacts and ensure efficient and environmentally-protective use of Navy training and testing ranges (e.g., long term fate of munitions constituents, Recycling Material Potentially Presenting Explosive Hazard (MPPEH), etc.)



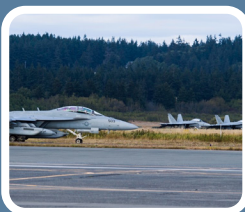
Ship-to-Shore Interface

Management of hazardous materials offloading to shore (e.g., Ballast collection and treatment, oil skimming technologies, etc.)



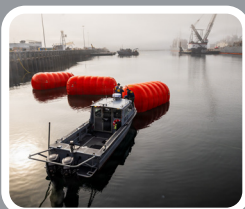
Weapon System Sustainment

Aircraft and ship sustainment environmental challenges impacting *contested logistics* and enhancing operational resilience (e.g., Zn-Ni as a cadmium substitute, hexavalent chromium replacements, etc.)



Air & Port Operations

Enhance air and port operations for Fleet readiness (e.g., multi-chemical detection systems, monitoring and remediation of Navy sediment sites near pier, etc.)



Regulatory & Base Operations

Development of cost-effective methods for managing environmental compliance (e.g., improved storm water runoff, detection and remediation of PFAS, etc.)

NESDI CUSTOMERS

NESDI's primary customers are the Navy personnel whose mission success requires efficient environmental protection solutions. Environmental requirements impact everyone from Fleet Maintenance Personnel in our shipyards and Testing and Training Range Personnel on the ground, to the Regional and Installation Environmental Program Managers responsible for day-to-day compliance.

By developing and transitioning innovative technologies and methodologies, NESDI provides solutions that address evolving environmental challenges, enabling environmental compliance while supporting operational efficiency and Fleet readiness.



Fleet Maintenance Personnel



Fleet Readiness Centers & Shipyards



Testing & Training Range Personnel



Members of Environmental Working Groups and Media Teams



Regional, Field Activity, & Installation Environmental Program Managers



CNO N411 Leadership & NAVFAC Headquarters

Your Environmental Challenge Starts Here.

The NESDI program connects real-world site issues with the funding and research to solve them.

Your Need is the first step.

Define the next wave of environmental innovation.

Submit your need:

<https://epl.navfac.navy.mil/NESDI>

(CAC Required)



THE NESDI PROGRAM PROCESS

Each year, the NESDI program follows a structured four-phase process to identify Navy needs and transition viable solutions into operational use and training activities. From start to finish, the process is driven by the program's core customers, including need submitters, end users, technical authorities, and warfighters who identify real-world operational needs.

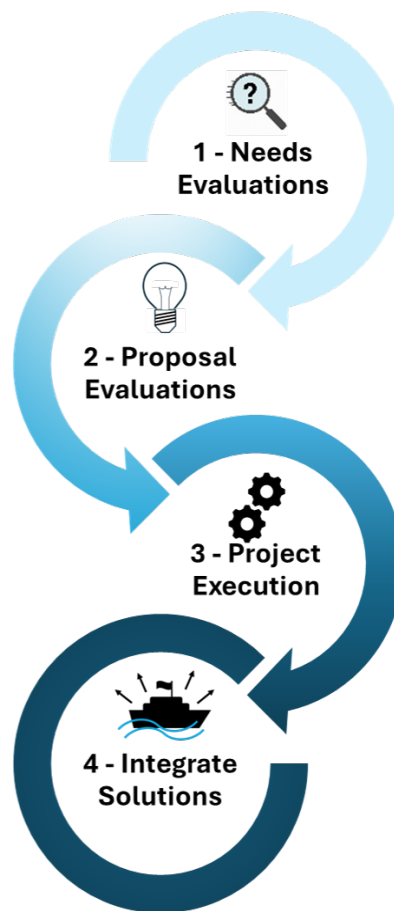
Their active partnership is critical at every stage: they help shape well-defined needs, guide the execution of individual projects, and support the successful integration of resulting technologies and innovations into the Fleet and shore operations. This hands-on collaboration ensures that NESDI investments deliver practical, effective, and mission-ready solutions with lasting impact.

ACTION: Principal Investigators (PIs) submit detailed project proposals, which are rigorously reviewed and ranked.

OUTCOME: Top-ranked proposals are selected for funding and become official projects.

ACTION: PIs and end users work together to integrate the proven solution directly into Fleet and shore operations.

OUTCOME: Mission-ready solutions with lasting impact.



ACTION: The Technology Development Working Group (TDWG) reviews environmental needs submitted from across the Fleet.

OUTCOME: Approved needs advance to the proposal stage.

ACTION: PIs and end users collaboratively develop a Project Management Plan (PMP) to guide the project's 2-3 year execution.

OUTCOME: Projects deliver validated technologies and methodologies ready for transition.



THE NESDI PROGRAM PROCESS (CONTINUED)

FY25 NESDI PROCESS		
Needs		
Needs submitted		29
Needs approved		18
Proposals		
Pre-proposals submitted		19
Full proposals submitted		12
Projects		
Projects launched		7
% of Needs that become projects		24%

For FY25, this process began in August of 2024, when 29 Needs were received. After navigating the NESDI program process, and considering funding allotments, 7 new start projects were launched in FY25 as part of this process.

FY25 concluded with NESDI successfully managing 42 ongoing projects and strategically investing in 7 FY26 new "starts" designed for near-term mission impact. The new projects directly address crucial naval environmental challenges, with a significant focus on keeping our installations ready and our people safe.

Three projects are tackling PFAS, one of Navy's top environmental priorities by demonstrating *in-situ* stabilization in sediments and establishing methods to quantify its distribution and background levels, work that is critical to ensuring our bases can continue to support the Fleet. To directly enhance warfighter safety, two other new starts are validating non-chromium primers for aerospace repairs and evaluating alternative non-Methylene Chloride paint strippers, reducing health risks for our maintainers. The portfolio is rounded out by efforts to improve readiness and logistics, including establishing a new Support Equipment Deployed Aviation Hazardous Materials List (SE DAHML) for better HAZMAT tracking on deployment and addressing emerging concerns like tire wear particles to prevent future operational interruptions.

Key Dates:

- Pre-proposals due – 12 December 2025
- Full proposals due – 18 March 2026
- In Progress Reviews – 4-8 May 2026
- FY27 Projects selected – Late Summer 2026
- Needs due for FY28 cycle – 01 August 2026

Full NESDI schedule available on the CAC enabled website:
<https://epl.navfac.navy.mil/nesdi>



PROJECT METRICS

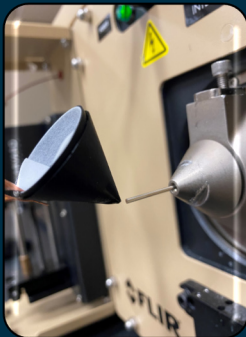
The impact of the NESDI program is continually measured by its progress in delivering mission-ready solutions. The metrics tracked below, Publications, Presentations, Patents, and Cooperative Research and Development Agreements (CRADAs) are more than just administrative achievements; each one represents a critical step in moving a technology from the lab into the hands of the warfighter. Publications and Presentations serve as the essential first step in transition, ensuring that a validated solution is socialized across the Fleet so engineers, operators, and acquisition managers can put it to use. Meanwhile, Patents and CRADAs formalize these innovations, protecting the Navy's investment and enabling collaboration with industry to solve tough operational challenges faster. Together, these indicators provide a comprehensive picture of how NESDI's investments create tangible outcomes that enhance operational readiness and protect our Sailors.

<i>FY25 METRICS</i>	
<i>CRADAs</i>	1
<i>Patent Applications/Awards</i>	7
<i>Peer Reviewed Publications</i>	2
<i>Non-Peer Reviewed Publications, Test and Technical Reports</i>	12
<i>Presentations</i>	33



Patents

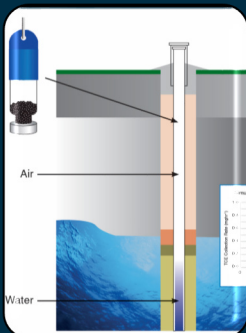
The NESDI program actively drives innovation by supporting the development and introduction of patents. Several key NESDI-funded technologies that are advancing toward commercialization are described below. Sustainability



In FY25, Dr. Patrick Fedick of NAVAIR, NAWC WD China Lake submitted three patent applications and was awarded two patents. Securing patents for NESDI Project No. 605 provides the Navy with a significant technological advantage in the rapid, low-cost, and in-situ detection of PFAS. These patents, awarded to Dr. Patrick Fedick for innovations like the 3D-Printed Cone Spray Ionization auto-sampler and sampling platform, protect the Navy's investment in a system capable of efficiently detecting and identifying these compounds at Department of War (DoW) and commercial sites. This ensures the technology can be transitioned into the fleet and other impacted sites, ultimately reducing environmental risks and associated costs. (Patent Award #'s: 12,390,811; 12,409,451)



Dr. Fedick has also submitted a patent disclosure in support of NESDI Project No. 635. Securing the patent for the "Tunable boron nitride nanomaterial photocatalysis for PFAS degradation" protects the Navy's investment in a novel, low-cost technology designed to destroy chemicals of concern. This intellectual property is vital for transitioning the continuous-flow remediation system to the fleet, allowing the Navy to mitigate environmental liabilities from waste streams like AFFF and enhance mission continuity.



By securing a patent (application submitted FY25) for the novel groundwater monitoring technique developed by Tom Boyd under NESDI project No. 573, the Navy protects its innovative method of using passive samplers in well casings, which overcomes the limitations of current technologies. This critical intellectual property ensures the Navy can exclusively implement this more reliable and cost-effective approach for long-term contaminant monitoring, leading to improved site management and reduced environmental liability across its installations.

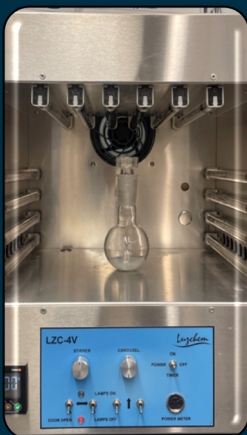
Peer Reviewed Publications

NESDI scientists disseminate their findings and ensure scientific rigor primarily through peer-reviewed publications, including the examples highlighted below.



Project No. 605: 3D-Printed Cone Spray Ionization Mass Spectrometry for the Rapid, Low-Cost and *In-Situ* Detection and Mapping of PFAS in Soil, led by NAVAIR, NAWC WD China Lake scientist Patrick Fedick, Ph.D., supported the publication of a manuscript in the journal *Talanta Open*. *Talanta Open* is a peer-reviewed, open access journal that publishes research in all areas of pure and applied analytical chemistry, with the requirement that submitted methods are validated and compared to previously reported work.

Bain, R.M.; Pinedo, T.J.; Klapec, D.J.; Mulligan, C.C.; Fedick, P.W. 2024. Post-Burn and Post-Blast Rapid Detection of Trace and Bulk Energetics by 3D-Printed Cone Spray Ionization Mass Spectrometry. *Talanta Open*. 10(2024) 100377. DOI:10.1016/j.talo.2024.100377



Project No. 635: Boron Nitride Nano-Photocatalyst Membrane Filters for the Degradation of Aqueous PFAS to CO₂ and Fluoride, also led by Dr. Fedick, published research on enhanced PFAS remediation methods. This work was published in a special issue in the journal *Chemosphere: Per- & Polyfluorinated Substances: Environment, Foods & Human Exposure*. The aim of this special issue in *Chemosphere* was to collate the most recent studies on the analytics, occurrence, fate, and toxicology of the growing number of polyfluoroalkyl substances (PFAS).

Castracane, E.; Molnar, B.T.; Lambert, A.; Harvey, B.G.; Estevez, J.E.; Fedick, P.W. 2025. Improved Boron Nitride Nanomaterial Morphologies for the Enhanced Photocatalytic Remediation of Perfluorooctanoic Acid. *Chemosphere*. 382(2025) 144466. <https://doi.org/10.1016/j.chemosphere.2025.144466>

Presentations

For the NESDI program, presentations are not just a way to share research; they are a critical tool for driving technology transition and ensuring mission success. Each presentation is a targeted effort to socialize a new capability with the stakeholders who can either approve its use or directly benefit from it. Several notable presentations were delivered over the past year and are highlighted below.



Spotlight on the Battelle Bioremediation and Environmental Technology Conference



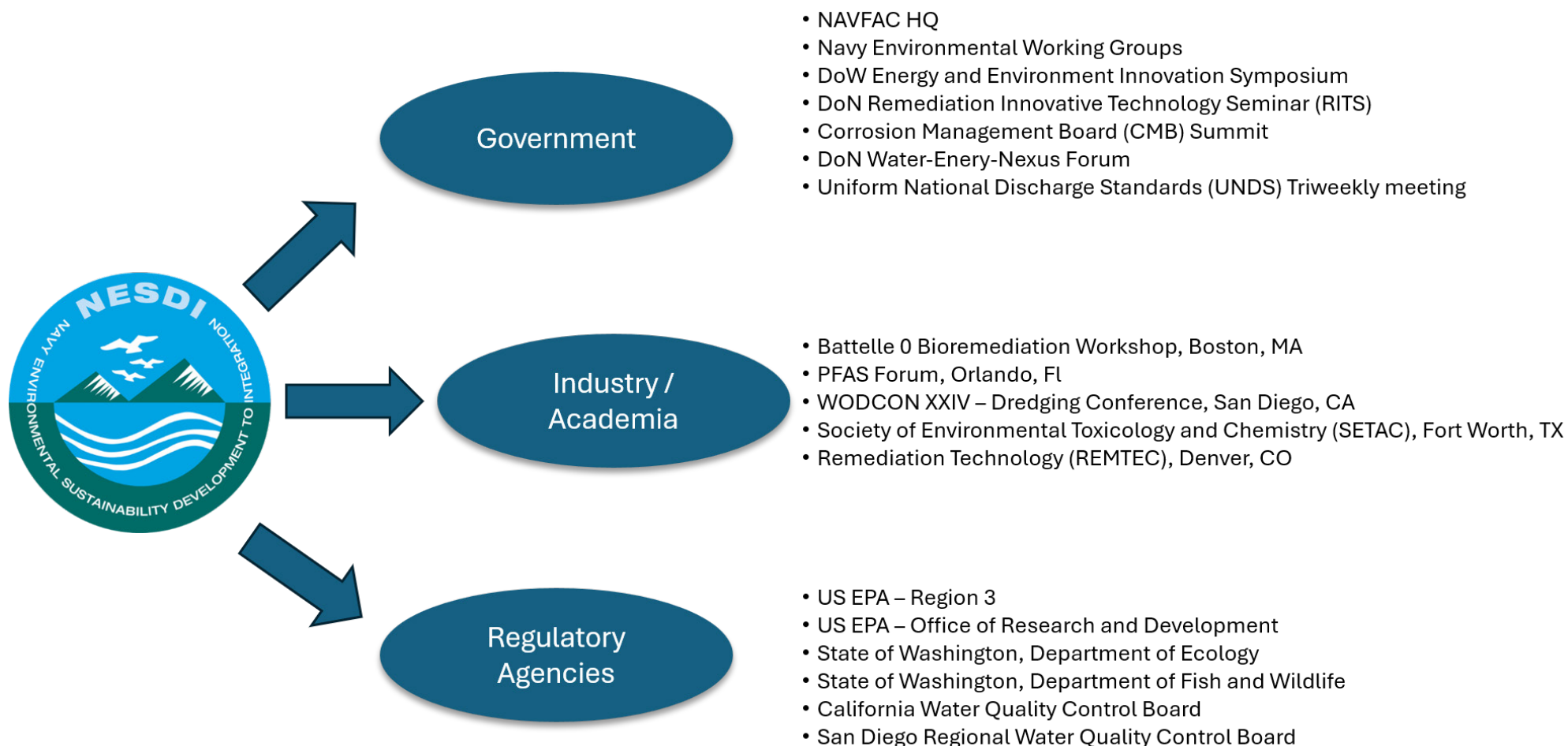
In June 2025, the NESDI program showcased the Navy's innovative research at the prestigious Battelle Bioremediation and Environmental Technology Conference in Boston, presenting findings from projects 569, 596, and 602 to a highly influential audience of academic, industry, and government professionals.

NESDI projects were showcased to a wide spectrum of influential audiences, ensuring the program's innovative research was disseminated to key military, regulatory, and scientific communities. A significant emphasis was placed on establishing a strong presence at prestigious environmental conferences, most notably at the Battelle Bioremediation and Environmental Technology Conference, where projects 569, 594, 596, and 602 were presented to leading experts from academia, industry, and government. By presenting at these prominent forums, the goal is to clear potential regulatory hurdles that could otherwise impact training, maintenance, and operations. This outreach extended to other major forums, with Project 569 presentations at the PFAS Forum and REMTEC, and Project 601 engaging stakeholders at multiple SERDP/ESTCP workshops and SETAC meetings.

Beyond broad industry conferences, the program targeted specialized and internal audiences to facilitate direct technology transition. Project 595, for instance, was presented at both a dredging conference (WODCON XXIV) that directly addresses the challenge of keeping our ports and channels navigable for the Fleet and the DoN Environmental Restoration Conference. Critically, direct briefings were delivered to key decision-makers, such as Project 602's presentation to officials from the US EPA and NAVFAC that are designed to get specific technologies approved for use on our installations, and Project 610's multiple engagements with NAVSEA on Uniform National Discharge Standards (UNDS) ensuring that the environmental requirements of tomorrow do not limit the capabilities of our future warships. This strategic communication ensures NESDI's advancements are primed for adoption by regulators and fleet operators alike.



Connecting NESDI-Funded Projects: A Look at FY2025 Stakeholder & End-User Engagement



FY26 “NEW START” PROJECTS

The seven new start projects for FY26 represents NESDI’s forward-leaning commitment to ensuring future mission readiness and environmental stewardship. These projects went through the NESDI Program process in FY25 and are designed to directly tackle emerging environmental threats that could impact the warfighter, from the long-term consequences of PFAS contamination to the sustainability of our operational forces.

By proactively funding these high-priority research areas, the Navy is ensuring it stays ahead of emerging environmental regulations and equips the warfighter with cost-effective solutions that reduce risks and sustain the mission.



Project No. 637

Demonstration and Application of Amendments for PFAS In-situ Stabilization in Sediments
Nick Hayman
(NIWC Pacific)



Project No. 641

Quantifying PFAS Background Levels in Environmental Media within DoN impacted Installations
Channing Bolt, PhD
(NIWC Pacific)



Project No. 638

Determining BMP efficacy for tire wear particle discharge at Navy facilities
Nick Hayman
(NIWC Pacific)



Project No. 642

Alternative non-Methylene Chloride Paint Strippers
Julie Hancock
(NAVAIR NAWC AD PAX)



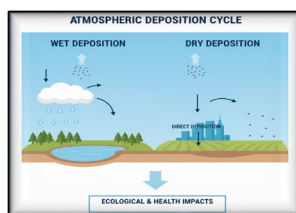
Project No. 639

Aerospace Class N Primer Crack Initiation Validation and Inner Mold-Line (IML) Demonstration for Authorization
Josh Walles
(NAVAIR NAWC AD PAX)



Project No. 643

Establishment of Navy Support Equipment Deployed Aviation Hazardous Materials (HAZMAT) List
Atish Gupta
(NAVAIR NAWC AD Lakehurst)



Project No. 640

Methodology to quantify PFAS distributions in precipitation and ambient soils at multiple Navy installations
Nikki Andrzejczyk, PhD
(NAVFAC EXWC)



Strategically selected to meet current operational demands, the FY26 new start projects underscore NESDI's commitment to the Navy's environmental and operational readiness. These initiatives are focused on delivering practical solutions that improve efficiency, bolster sustainability, and ensure regulatory compliance. A summary of each project's objectives and expected impact is provided below.

Fact sheets for the news starts are available online at:

<https://exwc.navfac.navy.mil/nesdi>

**Demonstration and Application of
Amendments for PFAS In-situ
Stabilization in Sediments
(Project no. 637)**

PRINCIPAL INVESTIGATOR:

Nick Hayman, NIWC Pacific

This project aims to test and confirm a method for reducing PFAS-impacted sediments directly in place using reactive particles. The goal is to bind the PFAS chemicals to these particles, preventing them from spreading into the water. The primary benefit to the Navy is providing a cost-effective, less disruptive alternative to dredging for managing impacted sites. This in-situ treatment helps the Navy meet environmental regulations and reduce long-term liability associated with PFAS impacts in sediment.



AquaGate+ amendments being deployed at a Navy site. This NESDI effort will build off previous DoW RDT&E investments to apply this technology for these persistent compounds. (Photo Credit: Courtesy of ESTCP project no. ER-201131)

Determining BMP Efficacy for Tire Wear Particle Discharge at Navy Facilities (Project no. 638)

PRINCIPAL INVESTIGATOR:

Nick Hayman, NIWC Pacific

The objective is to identify the sources and measure the amount of tire wear particles (TWPs) and related chemicals being discharged through stormwater from Navy bases. This research will also determine how effective current stormwater treatment systems (BMPs) are at capturing these pollutants. For the Navy, this work is crucial for complying with water quality regulations and minimizing the environmental impact of base

operations. Understanding and improving BMP effectiveness protects local ecosystems from harmful runoff.



Vehicles at Navy installations can contribute to road-side particulates that ultimately enter stormwater systems and are then subject to regulatory monitoring. (U.S. Marine Corps photo by Lance Cpl. Jack Labrador)

Aerospace Class N Primer Crack Initiation Validation and Inner Mold-Line (IML) Demonstration for Authorization (Project no. 639)

PRINCIPAL INVESTIGATOR:

Josh Walles, NAVAIR/NAWC AD PAX

This project will test non-chromium primers against the current chrome-based standard to see how well they prevent cracks from forming and growing on aircraft. The best-performing alternatives will then be tested on actual aircraft to gain official authorization for use in IML touch-up repairs. The key benefit for the Navy is the reduction of hazardous materials, which

enhances worker safety and lowers the costs associated with environmental compliance. This allows the Navy to use safer materials without compromising aircraft structural integrity or readiness.



T-44C Pegasus aircraft are critical assets within the Navy for advanced multi-engine pilot training. (U.S. Navy photo by Lt. Michelle Tucker)



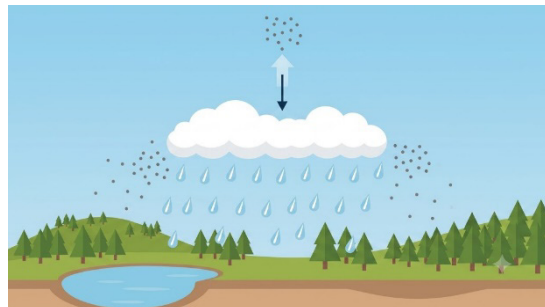
Methodology to quantify PFAS distributions in precipitation and ambient soils at multiple Navy installations (Project no. 640)

PRINCIPAL INVESTIGATOR:

Ricardo Estrada, EXWC

The goal of this effort is to create and validate a reliable approach for measuring baseline levels of PFAS that are already present in precipitation and soil from general anthropogenic sources. By establishing these background concentrations, the Navy can set more realistic and defensible cleanup targets for its impacted sites. This ensures that remediation efforts are focused on impacts caused by Navy activities,

preventing unnecessary and costly cleanups to levels below the natural background.



Deposition sources of PFAS can be from many sources such as direct on-site use, nearby short-range sources or long-range transport. (Photo Credit: AI image – Google Gemini)

Quantifying PFAS Background Levels within DoN Installations (Project no. 641)

PRINCIPAL INVESTIGATOR:

Channing Bolt, PhD, NIWC Pacific

This project will provide a scientifically defensible dataset that can be used to determine appropriate approaches for determining background PFAS at impacted sites. This benefits the Navy by providing a scientific basis to differentiate site impacts from background levels and by potentially identifying more efficient and cost-effective methods for environmental monitoring.



State of the art Element XR High Resolution Inductively Coupled Plasma Mass Spectrometer (HR-ICP-MS) (left; image by Thermo) paired with a seaFAST SP3 unit (right; image by Dr. Channing Bolt) to determine ΔF concentrations of fluorine isotopes.

Alternative non-Methylene Chloride Paint Strippers (Project no. 642)

PRINCIPAL INVESTIGATOR:

Julie Hancock, NAVAIR/NAWC AD PAX

This effort seeks to identify and test the performance of paint strippers that do not contain the hazardous chemical methylene chloride. These alternatives will be evaluated on various Navy aircraft coatings that have been aged to simulate real-world conditions. For the Navy, finding an effective and safe alternative improves the health and safety of maintenance crews. It also reduces the significant costs and logistical burdens associated with

handling and disposing of hazardous chemicals.



Aviation Machinist's Mate applies paint remover to the welds of a jet engine bracket. Prohibitions on the use of methylene chloride will impact maintenance processes across the Navy creating a critical need to identify a suitable replacement. (U.S. Navy Photo by Mass Communication Specialist Seaman Christopher Frost)

Navy Support Equipment Deployed Aviation HAZMAT List (Project no. 643)

PRINCIPAL INVESTIGATOR:

Atish Gupta, NAVAIR/NAWC AD Lakehurst

The objective of this project is to create a comprehensive list of hazardous materials (HAZMAT) required for maintaining aviation Support Equipment (SE) during deployment. This new list, the SE Deployed Aviation HAZMAT List (DAHML), will be integrated into the existing aircraft DAHML to improve logistics and planning. The direct benefit to the Navy is enhanced operational readiness, as it ensures

that deployed units can accurately forecast and order the necessary materials to keep their essential support equipment functioning.



The management of hazardous materials (HAZMAT) aboard ships is a critical responsibility. The SE DAHML system will significantly reduce redundancy and minimize waste, both at sea and ashore. (U.S. Navy photo by Mass Communication Specialist 3rd Class Johnathan Meighan).



FY25 PROJECT ACCOMPLISHMENTS

In this section of the FY25 Year in Review report, we spotlight the projects that achieved notable accomplishments and milestones over the course of this fiscal year. These successes directly align with the NESDI mission to support Fleet readiness by minimizing risk, reducing compliance costs, and delivering innovative, validated technologies.

Our deepest thanks go to the leadership and staff of Puget Sound Naval Shipyard for graciously hosting the demonstrations of new methods and technologies funded by the NESDI program. The access to shipyard facilities and the professional assistance provided by the staff were invaluable. This partnership is essential for transitioning innovative solutions to the fleet.



The support from Puget Sound Naval Shipyard (PSNS) has been vital for advancing new solutions. Below are three NESDI-funded projects recently demonstrated and a fourth project currently underway at the shipyard that showcase the direct operational and environmental benefits of our partnership.



PSNS team gathering near the recently installed Low-profile Integrated Porous Pretreatment Swale; NESDI Project #583.
Image credit: Denis Acosta.



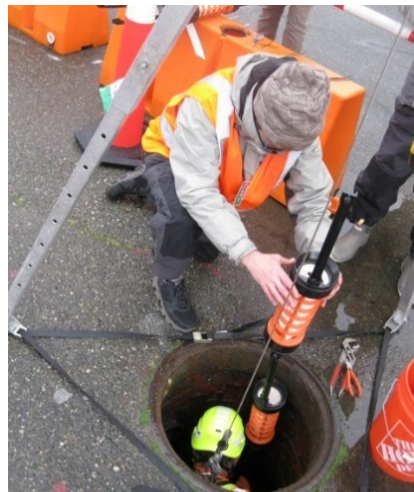
In-Pipe Stormwater Treatment Unit (I-STUB) (Project no. 576)

PRINCIPAL INVESTIGATOR:

Brandon Swope, NIWC Pacific

Led by Brandon Swope of NIWC Pacific, Project 576 developed the In-Pipe Stormwater Treatment Unit (I-STUB), a modular system deployed directly inside stormwater pipes to capture and treat pollutants at the source. This innovative technology provides a low-cost, adaptable solution for PSNS to meet stringent water quality regulations without requiring new, space-intensive infrastructure. By tailoring treatment media to target specific metals and contaminants, the I-STUB units currently being deployed at the shipyard offer a direct and efficient path to compliance for industrial

stormwater outfalls. I-STUB units are currently being evaluated for potential deployment at Naval Surface Warfare Center, Crane, Indiana.



Deployment of ITUs at PSNS during FY24 storm season. (Photo Credit: Brandon Swope)

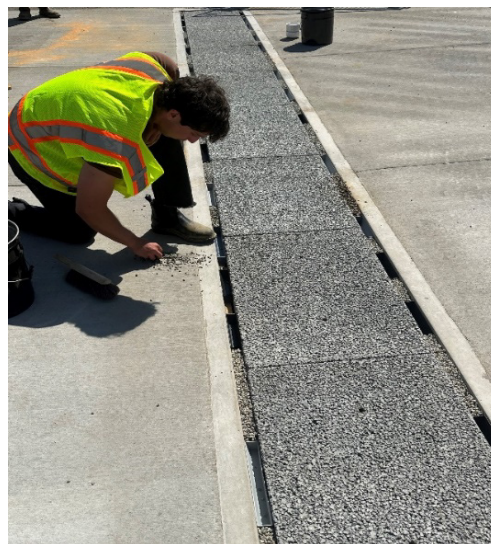
Low-Profile Integrated Porous Pretreatment Swale (LIPPS) (Project no. 583)

PRINCIPAL INVESTIGATOR:

Denis Acosta, NAVFAC EXWC

Led by Denis Acosta of NAVFAC EXWC, Project 583 implemented a Low-profile Porous Pretreatment Swale (LIPPS) at the shipyard to address a critical compliance challenge: high levels of copper and zinc runoff from a storage yard. The LIPPS system proved immediately effective, reducing metal concentrations from well above regulatory limits to non-detectable levels in stormwater effluent. This project provides PSNS with a targeted, low-maintenance solution that directly achieves regulatory compliance for a challenging outfall, protecting Puget

Sound and avoiding potential permit violations.



Installation of LIPPS at PSNS for the capture and treatment of stormwater runoff. (Photo credit: Denis Acosta)

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

PRINCIPAL INVESTIGATOR:

Molly Colvin, NIWC Pacific

Project 595, managed by Molly Colvin of NIWC Pacific, produced the SABL, an advanced sediment trap that can be remotely triggered to capture sediment deposition during specific events. Demonstrated at PSNS, the SABL provides the shipyard with highly precise data, directly linking operational activities and outfall discharges to sediment accumulation. This enhanced understanding of contaminant transport supports more accurate environmental models and cost-effective long-term management

strategies, ultimately reducing the risk and liability associated with impacted sediment sites.



Deployment of the SABL adjacent to an outfall at PSNS for the duration of the FY24 storm season. (Photo credit: Molly Colvin)

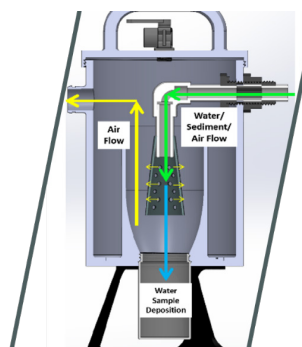
Assessing emerging chemicals of concern and loading from Navy industrial surfaces (Project no. 629)

PRINCIPAL INVESTIGATOR:

Nick Sarracco, NIWC Pacific

A relatively new project currently underway at the shipyard, led by Nick Sarracco of NIWC Pacific, is focused on tackling the emerging environmental threat of tire wear particles (TWPs). Using a novel water vacuum sampling system, the team will assess TWP and associated leachate concentrations directly from industrial surfaces. This effort will provide PSNS with critical, site-specific data and, most importantly, will directly measure the effectiveness of best management practices (BMPs) like sweeping in

reducing these harmful pollutants before they enter the water, equipping the shipyard with a validated method to proactively manage a future regulatory challenge.



NIWC Scientist Nick Sarracco holding the WRASSE system (Image/Photo credit: Nick Sarracco)

In addition to successfully transitioned technologies, the NESDI program continues to generate impactful results across a range of fleet and shore challenges. The following project accomplishments highlight how this research delivers tangible benefits in environmental compliance, cost reduction, and operational efficiency.

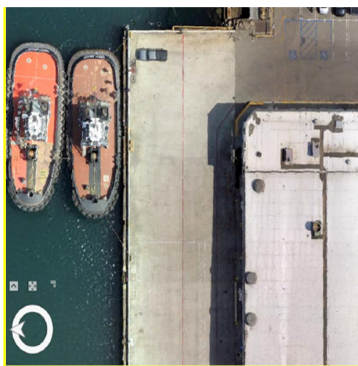


Project No. 580

This effort, led by Diane Kleinschmidt of NAWC AD Pax River, focused on extending the shelf-life of critical aircraft sealants to reduce waste and cost. Testing confirmed that the shelf-life for most polysulfide and polythioether sealants can be safely extended by three months, independent of storage conditions. As a result, NAVAIR is issuing an authorization letter for this extension, which is projected to save the Navy at least \$130,000 annually. This practical solution directly reduces the amount of hazardous material waste generated from expired products, providing a clear environmental benefit and adding to fleet readiness.

Project No. 603

Led by Dr. Channing Bolt of NIWC Pacific, this project developed a unique dome system to measure the actual, in-situ copper leach rates from antifouling coatings on Navy vessels. The study found that hull cleaning significantly increases copper release on newer coatings but has little effect on coatings older than six years, which showed minimal leaching. This data provides NAVSEA with a powerful tool to optimize hull cleaning schedules and dry-docking intervals. By providing scientifically defensible, real-world data, the project helps the Navy more accurately address environmental regulations and challenge overly conservative copper loading estimates.



Project No. 624

Dr. Nicolette Andrzejczyk of NAVFAC EXWC is leading a project that uses drone-mounted LiDAR and imagery to create high-resolution topographic models of Navy installations. These detailed models are essential for improving coastal resiliency planning by more accurately predicting the impacts of flooding and tidal inundation on critical infrastructure. This gives installations a powerful tool to identify vulnerabilities in their existing environmental remediation sites and make informed decisions on future cleanup strategies. The effort will culminate in an automated ArcGIS toolbox, allowing any installation to better protect their assets and ensure long-term environmental security against coastal hazards.



PROJECT CLOSEOUTS

The NESDI program successfully concluded eleven projects in FY25, with each delivering measurable impact and validated, innovative solutions. These achievements directly advanced the program's mission by improving operational efficiency, strengthening environmental sustainability, and bolstering the Navy's long-term readiness goals. For additional information on any of the projects listed below, please contact the NESDI Program.

- Tony Danko, Ph.D., NAVFAC EXWC
- Field Demonstration of Colloidal Activated Carbon for *In-situ* Sequestration of Per- and Polyfluoroalkyl Substances

Project No. 569



- Patrick Sims, Ph.D., NIWC Pacific
- Contaminant Monitoring and Mapping for Informing Stormwater Best Management Practices

Project No. 575



- Brandon Swope, NIWC Pacific
- In-Pipe Stormwater Treatment System

Project No. 576



- Diane Kleinschmidt, NAVAIR
- Development and Implementation of Methods to Reduce Sealant Waste in Fleet/Depot Level Operations

Project No. 580



- Joe Marchina, NAVAIR
- Assessment of Cadmium Alternatives for Connector Applications

Project No. 581



- Autumn Resto, NAVFAC EXWC
- Real-Time Multi-Contaminant Detection System (RMDS)

Project No. 584



- Gunther Rosen, NIWC Pacific
- Demonstration and Application of Amendments Targeting Comingled Organics and Metals in Sediments

Project No. 594



- Molly Colvin, NIWC Pacific
- Demonstration of a Signal Activated Bottom Lander Trap

Project No. 595



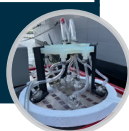
- Tony Danko, Ph.D., NAVFAC EXWC
- Integrated Analytical Approach to Transition from Active to Passive Treatments at Munitions Sites

Project No. 596



- Channing Bolt, Ph.D., NIWC Pacific
- Characterization of Antifouling Paint and Environmental Loading with Navy Dome System

Project No. 603



- Erick Iezzi, NRL
- Oxsol-Free and Low-VOC Surface Ship Topside Coatings for Maintaining Environmental Regulations

Project No. 609



PROMOTING OUR SUCCESS

To ensure the Navy community is aware of emerging solutions, the NESDI program highlights its technology and methodology advancements through various outreach products. Our fact sheets, newsletters, brochures, and "Year in Review" reports are designed to showcase project successes and demonstrate the program's return on investment, facilitating the transition of innovative environmental technologies to end-users.

After a brief hiatus focused on enhancing our communication strategy, *NESDI News* returns with an updated format, designed to bring you even impactful insights into our technical achievements and program events.

Quarterly Newsletters

Stay at the forefront of Navy environmental innovation with NESDI News: Highlights and Happenings. This electronic publication delivers crucial updates on project breakthroughs, addresses emerging regulatory concerns, and recaps major program events throughout the year. It's your essential guide to the technologies shaping the future of Navy environmental stewardship.

Catch up on past issues and sign up to receive our newsletters to your inbox here:

<https://epl.navfac.navy.mil/NESDI/NewsLetters.aspx>



Project Fact Sheets

Get an in-depth look at every NESDI-funded technology through our library of project fact sheets. These downloadable resources provide a clear and concise overview of each project's lifecycle, tracking its progress from the original problem statement to a tangible, realized solution. They are the fastest way to understand the value and impact of the program's investments in solving the Navy's environmental challenges.

Explore the full portfolio of solutions and download fact sheets here: <https://epl.navfac.navy.mil/nesdi/projects>



FOR MORE INFORMATION

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

Clayton Ferguson

Program Manager
NAVFAC EXWC
clayton.w.ferguson2.civ@us.navy.mil

Molly Colvin

Communications
NIWC Pacific
marienne.a.colvin.civ@us.navy.mil

Christy Bixler

CNIC HQ
christy.d.bixler.civ@us.navy.mil

Patrick Earley

NIWC Pacific
patrick.j.earley.civ@us.navy.mil

Jeff Henning

NAVSUP
jeffrey.a.henning.civ@us.navy.mil

Lisa Rotty

NAVSEA HQ
Lisa.rotty.civ@us.navy.mil

Cindy Webber

Deputy Program Manager
NAVFAC EXWC
cynthia.k.webber.civ@us.navy.mil

Michelle Alcorn

Web Support
NAVFAC EXWC
michelle.c.alcorn.civ@us.navy.mil

Julie Broughton

NAVFAC EXWC
julie.d.broughton.civ@us.navy.mil

Karla Harre

NAVFAC EXWC
karla.j.harre.civ@us.navy.mil

Bill Hertel

NAVSEA NSWC Carderock
william.m.hertel4.civ@us.navy.mil

Luzmarie Youngers

NAVAIR NAWC AD PAX
luzmarie.youngers.civ@us.navy.mil

The program benefits immensely from the direct participation and oversight of our sponsor, **OPNAV N4I1**. We are deeply grateful to Rachel Methvin for her dedicated support and guidance throughout her tenure. As she moves on to a new opportunity, we wish her the very best and warmly welcome our new sponsor, Ben Colbert, with whom we look forward to continuing this critical partnership.

Document preparation and graphic design services were provided by Molly Colvin, NIWC Pacific.





[HTTPS://EPL.NAVFAC.NAVY.MIL/NESDI](https://EPL.NAVFAC.NAVY.MIL/NESDI) (CAC ENABLED)

[HTTPS://EXWC.NAVFAC.NAVY.MIL/NESDI](https://EXWC.NAVFAC.NAVY.MIL/NESDI) (PUBLIC SITE)