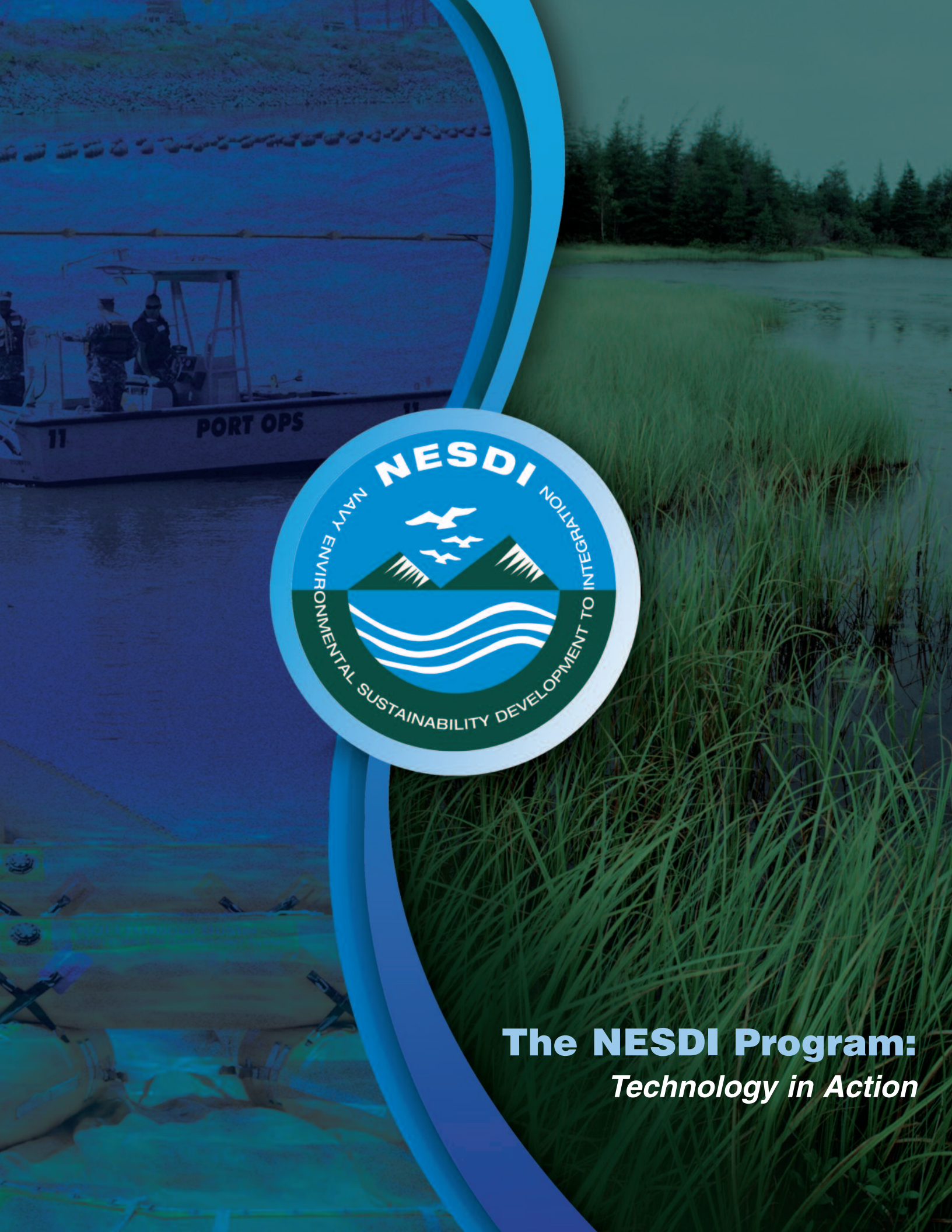


The NESDI Program:

Technology in Action

The NESDI Program

Technology in Action

What NESDI is All About

The Navy Environmental Sustainability Development to Integration (NESDI) program is the Navy's environmental shoreside 6.4 Research, Development, Test and Evaluation (RDT&E) program. The NESDI technology demonstration and validation program is sponsored by the Chief of Naval Operations Energy and Environmental Readiness Division (CNO N45) and managed by the Naval Facilities Engineering Command (NAVFAC). The program is the Navy's complement to the Department of Defense's (DoD) Environmental Security Technology Certification Program (ESTCP) which conducts demonstration and validation of technologies important to the tri-Services, U.S. Environmental Protection Agency and Department of Energy.

Operational Range Clearance — Alternative Tank Target (project #289)

TESTIMONIAL

"The alternative tank target is holding up well. I believe that this type of environmentally friendly target will be viable if funding can be obtained to construct it. Traditionally M-60 tank targets that contained asbestos in their engine compartments were inadvertently placed on the range that resulted in abatement that cost over $35,000 to remediate."

—Chris Townsend (Pinecastle Range Facility)

Our Mission

The mission of the NESDI program is to provide solutions by demonstrating, validating and integrating innovative technologies, processes, and materials and filling knowledge gaps to minimize operational environmental risks, constraints, and costs while supporting Fleet readiness.

Our Vision

The vision of the NESDI program is to be the Navy's premier applied technology development and demonstration program that integrates innovative solutions and knowledge to shape investments in global, emerging environmental challenges that sustain Fleet readiness.

Our Sponsor

The NESDI program supports CNO N45's focus on addressing the environmental technology requirements of Navy shore and range operations and improving management processes for achieving and maintaining the environmental readiness of the fleet. CNO N45 provides resources and oversight regarding research and development (R&D) investments and develops and maintains overarching environmental readiness capability requirements. CNO N45 also develops policy and guidance to support Navy compliance with environmental laws and regulations and provides oversight of Navy environmental compliance and restoration programs.

This project demonstrated and validated an alternative green tank target which contains no hazardous components versus the tanks used in current practice. The green target is an effective replacement for the diminishing supply of M-60 tanks.

The NESDI Program

Our Customers

Is This Program for Me?

The NESDI program provides resources to Navy activities that are actively involved in the testing and evaluation of emerging technologies and materials and enhancements to existing environmental management and industrial processes. In an effort to retain in-house capabilities and subject matter expertise, the role of NESDI program Principal Investigators has typically been limited to personnel at naval facilities. Specialized or unique skills are often obtained by reaching out to the academic and contractor communities on a project-by-project basis.

Historically, program resources have been distributed to employees of NAVFAC, the Naval Air Systems Command (NAVAIR), the Naval Sea Systems Command (NAVSEA) and the Space and Naval Warfare Systems Command (SPAWAR). NESDI Principal Investigators often collaborate with personnel from other Navy research organizations.

Our Primary Customers

The NESDI program concentrates its efforts on the following customer base:

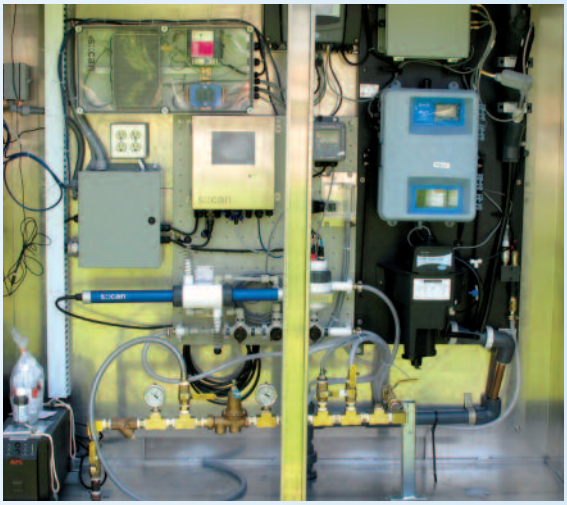
1. **Fleet Maintenance Personnel.**
   Enlisted, civilian and contractor personnel who maintain Navy assets (aircraft, ships, etc.) for insights into the outstanding needs of the maintenance community and help to integrate environmentally-friendly technologies, materials and industrial process changes into the daily operation of Navy maintenance facilities.

2. **Testing & Training Range Personnel.**
   The managers and support staff of the Navy's testing and training ranges who have the need to operate those ranges in an environmentally-compliant and efficient manner.

3. **Members of Environmental Working Groups & Media Teams.**
   Members of the various Navy environmental working groups and media field teams who identify outstanding technology demonstration/validation needs.

4. **Regional, Field Activity & Installation Environmental Program Managers.**
   Personnel who operate and oversee the execution of environmental programs at Navy regions, field activities and installations, including the Fleet Readiness Centers and shipyards who identify outstanding needs, support on-site technology demonstrations and are the primary users of the program products and services.

5. **CNO N45 Leadership & NAVFAC Headquarters.**
   The managers and staff at CNO N45 and NAVFAC headquarters who are among the first to recognize the need for the demonstration and validation associated with emerging requirements identified in new Executive Orders, regulations, directives, and instructions including encroachment greenhouse gas emissions, climate change and the interface between energy and environmental management—topics that may impact the future operations of the Navy.



Now operational at Naval Base Ventura County, this effort provided an early warning system to mitigate water safety concerns through real-time monitoring technology combined with automated data communication, reporting and event warnings.

6. **Acquisition Program Managers.**
   Acquisition program managers and their Environmental, Safety and Occupational Health Coordinators who identify the need for technology demonstration and validation and guide the integration of solutions across multiple weapon system platforms.

Real-Time Drinking Water Quality Monitoring Technology (project #356)

TESTIMONIAL

"The Real-Time Drinking Water Quality Monitoring Technology is a useful tool for continuously monitoring key parameters in our drinking water distribution system. One critical parameter for us is the amount of ammonia in our system because it can contribute to nitrification. The system gives us the capability to provide feedback to our water purveyor upon detection of unusual events that could come from undetected equipment failure."

—Gilbert Gong/Steve Latting
(Naval Base Ventura County)

The NESDI Program

Transitioning Green Technologies to the Fleet

The NESDI program follows a four phase process:

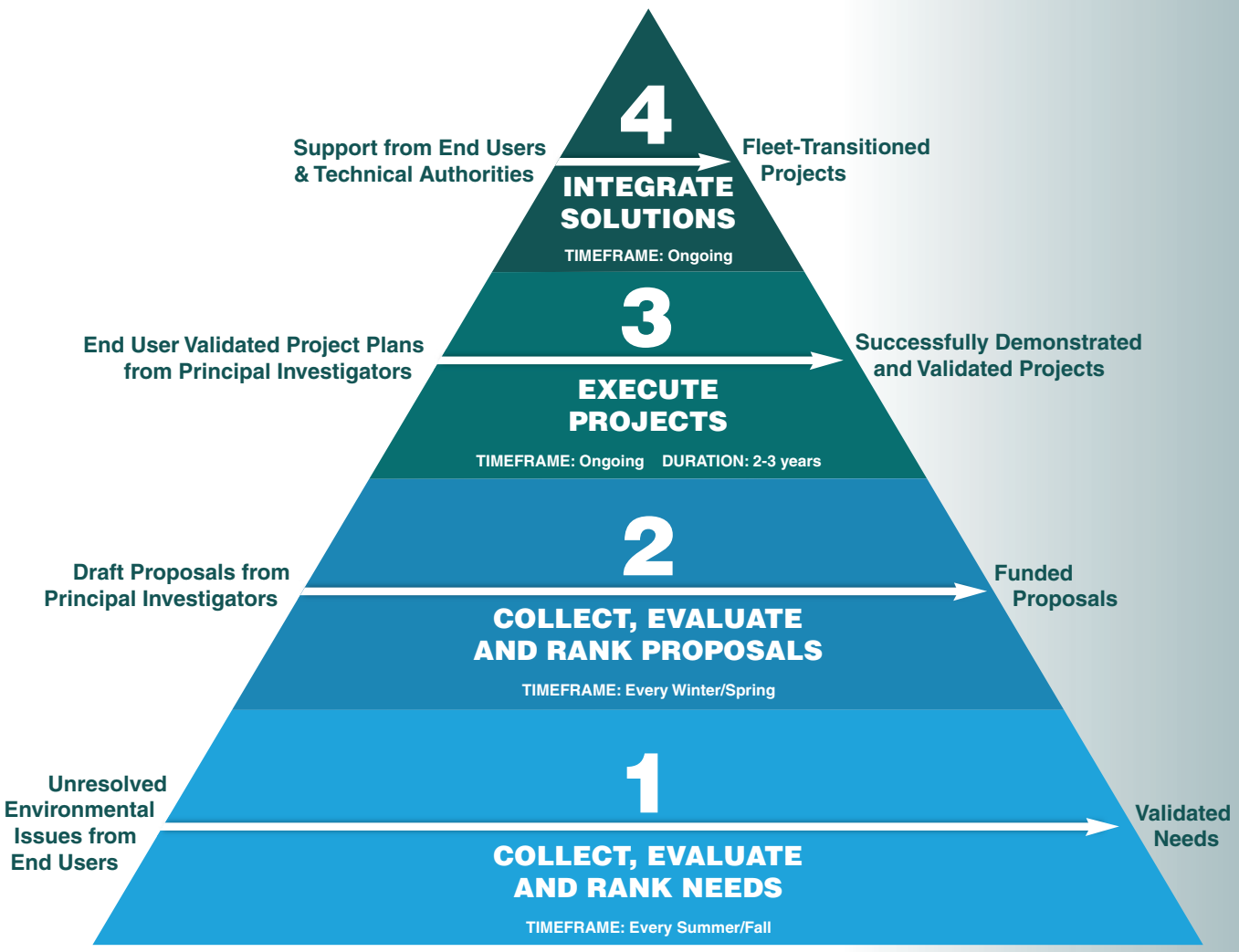
1 Collect, Validate & Rank Needs.
During this first phase of the process, the program's management team—the Technology Development Working Group (TDWG)—solicits environmental needs from across the Navy's shore community. Once received, the TDWG then validates and ranks those needs based on a variety of criteria including whether the need falls within one of the program's priority investment areas, the pervasiveness of the problem across the Navy, the extent and severity of the associated compliance risk, and the potential impacts on the mission of the fleet if the need is not addressed.

2 Collect, Evaluate & Rank Proposals.
During this phase of the NESDI program process, the TDWG collects project proposals that address the needs already collected in the first phase of the program process. In particular, the TDWG requests, collects and reviews short pre-proposals and the subsequent detailed, full-length project proposals before recommending to the program's resource sponsor (CNO N45) which projects should receive program support.

3 Execute Projects.
Once proposals have been selected and funded, the program—through initial planning, ongoing reporting and management oversight—ensures that the projects remain properly focused on the needs they were intending to address.

4 Integrate Solutions.
Throughout the project lifecycle, program personnel concentrate on moving the demonstrated technologies and other solutions out of the laboratories and demonstration sites and into the appropriate operational environment. During this fourth and final phase of the NESDI program process, the TDWG, Principal Investigators and technology integration specialists work together to ensure that various solutions are successfully integrated into the fleet and weapons system acquisition programs and verify that the solutions provide the anticipated benefits.

The NESDI Program Process



Transitioning Green Technologies to the Fleet

Throughout this process, the program's targeted customers including need submitters, end users, technical authorities, and other stakeholders, provide valuable input to develop meaningful needs, support the ongoing execution of individual projects and help to ensure the successful integration of products and other solutions. The inputs, outputs and timeframes associated with each of the four stages are highlighted in the above diagram.

The NESDI Program

Investments

Where We Invest

The NESDI program makes its primary investments in the following areas and Environmental Enabling Capabilities (EEC):

1. **Range Sustainment (EEC-2).**
   In this area, the NESDI program invests in innovations that address environmental impacts and restrictions to ensure that naval training ranges and munitions testing/manufacturing ranges are fully available and efficiently utilized. Example projects in this area are:

   a. **Environmental Effects of Lasers on Biota in the Marine Environment.** This study defined the extent and diversity of laser-based systems being used in an underwater environment and characterized the impacts of those systems on underwater flora and fauna. This study determined that there are no environmental risks associated with the use of those systems. The results of this study are now being accurately and consistently reflected in the National Environmental Policy Act compliance documentation necessary for the fielding of new undersea surveillance and communication systems.

   b. **Toxicity/Bioaccumulation of Munitions Constituents in the Marine Environment.** This project resulted in the development of a comprehensive data set on the toxicity of munitions constituents to regulator-approved marine species and the definition of their potential for bioaccumulation, cellular level impacts and trophic transfer. The ultimate goal of this project is to evaluate the long-term environmental effects of leaving unexploded munitions in place and determine whether additional mitigations may be needed.

   c. **Environmental Effects of Military Expendable Material (MEM).** This project is assessing the potential environmental impacts from high priority MEMs to provide information necessary to support range complex environmental planning efforts.

   d. **Demonstration of Lime Application at Navy Open Detonation Sites.** This project is assessing the efficacy of applying lime for venting areas for practice, full-scale inert bombs to prevent regulatory action and sustain range operations by limiting the potential off-site migration of munitions constituents.

2. **Ship-to-shore Interface (EEC-4).**
In this area, the NESDI program invests in innovative techniques to manage ship hazardous material/waste offload to shore facilities. Example projects in the ship-to-shore interface area are:

a. **Surface Cleaning of Dry Dock Floors.**
This ongoing effort seeks to select, procure and integrate proven technologies that collect and concentrate solids and fine particles from dry dock floors, pump wells, cross connection channels, trenches, rail tracks and adjacent areas to the dry dock. The resultant solutions will allow shipyards to conduct their core business of maintaining Navy ships with fewer risks associated with environmental compliance and a reduction in the manual labor associated with facility cleaning.

b. **Motion Assisted Environmental Enclosure (MAEE) for Capturing Paint Overspray in Dry Docks.**
This NESDI effort is demonstrating and integrating a low-cost, modular device that combines semi-autonomous motion with portable containment to maximize operator productivity while capturing paint overspray before it is incorporated into dry dock industrial operations or discharges associated with flooding or storm water runoff into nearby waterways.

c. **Hull Maintenance Shroud.**
This project will leverage existing technologies to demonstrate a shroud which will provide a simple, economical solution for capturing waste streams associated with coating removal and surface preparation during ship repair and painting operations.

Innovative Technologies to Control/Reduce Emissions from Metal Cutting Operations (project #452)

TESTIMONIAL

"This was an essential need across all of the shipyards. We are very interested in this NESDI project and want to see it carried forward."

—Kurt Doehnert (Puget Sound Naval Shipyard)

3. **Weapon System Sustainment (EEC-3).**
In this investment area, the NESDI program sponsors solutions for the fleet maintainer to reduce the cost of compliance and increase fleet readiness. Example projects include:

a. **Evaluation of Corn Hybrid Polymer Blast Media for the Removal of Coatings from Delicate Substrates.**
This project is validating the use of corn hybrid polymer for the effective repair of aircraft radomes and other delicate substrates. The resulting technology provides an environmentally preferred method to replace chemical strippers and labor-intensive manual coating removal methods.

b. **Removal of Coke Deposits from F404 Engine Drive Shafts.**
This project successfully demonstrated the use of plastic blast media in a glove box environment to remove coke deposits from the F404 engine shaft, thereby eliminating the use of a hazardous cleaning compound from this maintenance procedure. This technology has been installed and is in use at Naval Air Station Oceana.

c. **Advanced Non-Chromate Primers & Coatings.**
The objective of this project is to evaluate coating systems built from current state-of-the-art non-chromate primers in conjunction with non-chromate metal finishes with the goal of implementing successfully characterized, demonstrated and authorized non-chrome primers on naval aviation assets.

d. **Cadmium Tank Electroplating Alternative.**
This project is demonstrating and validating an alkaline zinc-nickel alloy electroplating process as an alternative to tank cadmium electroplating on high strength steel and general surfaces at Fleet Readiness Center-level maintenance facilities. Additionally, this project will validate the tri-valent chrome process as an alternative to conventional hexavalent post treatments on the above alkaline zinc-nickel deposit.

The NESDI Program

Investments

Where We Invest *(continued)*

4. **Air and Port Operations (EEC-4).** The NESDI program also invests in approaches for addressing issues pertaining to air and port operations that ensure fleet readiness. Example projects in this area include:
   a. **Comprehensive Environmental Compliance Approach for Cathodic Protection in Caissons and Floating Dry Docks.** This project is validating a cathodic protection system to achieve effective corrosion prevention while reducing environmental impacts of caisson and floating dry dock ballast discharges.
   b. **Antifouling Oil Boom for Reduced Maintenance and Extended Service Life.** This study assessed the feasibility of coatings and other material advancements for permanent oil booms that mitigate biofouling accumulation and enhance compliance through increased reliability, extended life and a reduced maintenance burden.

Waste to Clean Energy Initiation Decision Report (IDR) (project #435)

TESTIMONIAL

"I want to thank the NESDI program for educating us via this study. NESDI personnel certainly rose to the occasion. We are looking at a waste management challenge here in San Diego in the coming years and this study provided us with some viable alternatives."

—Leslie McLaughlin (Navy Region Southwest)

5. **Regulatory and Base Operations (EEC-5).**
In this investment area, the NESDI program sponsors cost-effective methods for identifying, analyzing and managing environmental constraints related to current and projected regulatory impacts. Example projects include:

a. **Biodiesel for Ground Tactical Vehicles and Equipment.**
This project is establishing guidelines and limitations for the use of biodiesel with ground tactical vehicles and equipment in order to reduce hazardous emissions from diesel engines.

b. **Pollutant Source Tracking.**
This project is quantifying Navy contaminant loads by demonstrating and validating contaminant source tracking technologies and developing a technical framework that enables water program managers to attribute existing contamination loads to support their compliance programs. Inability to distinguish between Navy releases, background conditions, and other non-Navy responsible parties can result in excessive or unnecessary remediation costs for the Navy.

c. **Improved Assessment Strategies for Vapor Intrusion.**
This project resulted in a technical report that identifies existing best practices, knowledge and data gaps, and future research in vapor intrusion assessment strategies.

The NESDI program also receives multiple requests each year to help storm water managers improve storm water compliance. To address these challenges, the program has provided resources to demonstrate and validate commercially available systems and new systems as possible Best Management Practices (BMP) to maintain pollutant concentrations below permitted levels. Recent projects include:

d. **Electrochemical Detection and Load Reduction of Copper and Zinc in Storm Water Runoff.**
The objectives of this project are to quantify copper and zinc levels in storm water runoff using electrochemical methods and to track and identify the source.

e. **Optimization of the Storm Water Dual Media Filtration System.**
This project is optimizing a stormwater filtration system at the Navy Regional Recycling Center, San Diego so that the system consistently meets National Pollution Discharge Elimination System permit requirements for metals and other pollutants.

f. **Storm Water BMP Decision Support Tool Web Site.**
This web-based system was designed to help users identify the most cost effective storm water BMPs to address storm water runoff requirements.

Where We Don't Invest

The NESDI program's philosophy is not to duplicate investments that are more appropriately funded by other programs including:

- **Living Marine Resources Program**
- **Ship Afloat Program**
- **Radiological Control and Health Program**
- **Natural and Cultural Resource Program**
- **Cleanup of Environmental Restoration sites** (except as part of a leveraged investment to demonstrate a new technology or method such as the analysis and management of contaminated sediments or identification and management of vapor intrusion pathways)
- **The Navy's energy program** (except where there is a very strong environmental component to a particular energy management project)

The NESDI program does, however, leverage resources and expertise from other programs, including ESTCP, to maximize the integration of technologies across the various services and minimize duplicative efforts.

Successful NESDI Projects

Although the scope and focus of NESDI-sponsored projects are broad and diverse, most projects range in duration from two to three years with a total project funding level of $200,000 to $300,000. The following is a sampling of some of the technologies that were successfully demonstrated and studies that were successfully conducted over the past few years.

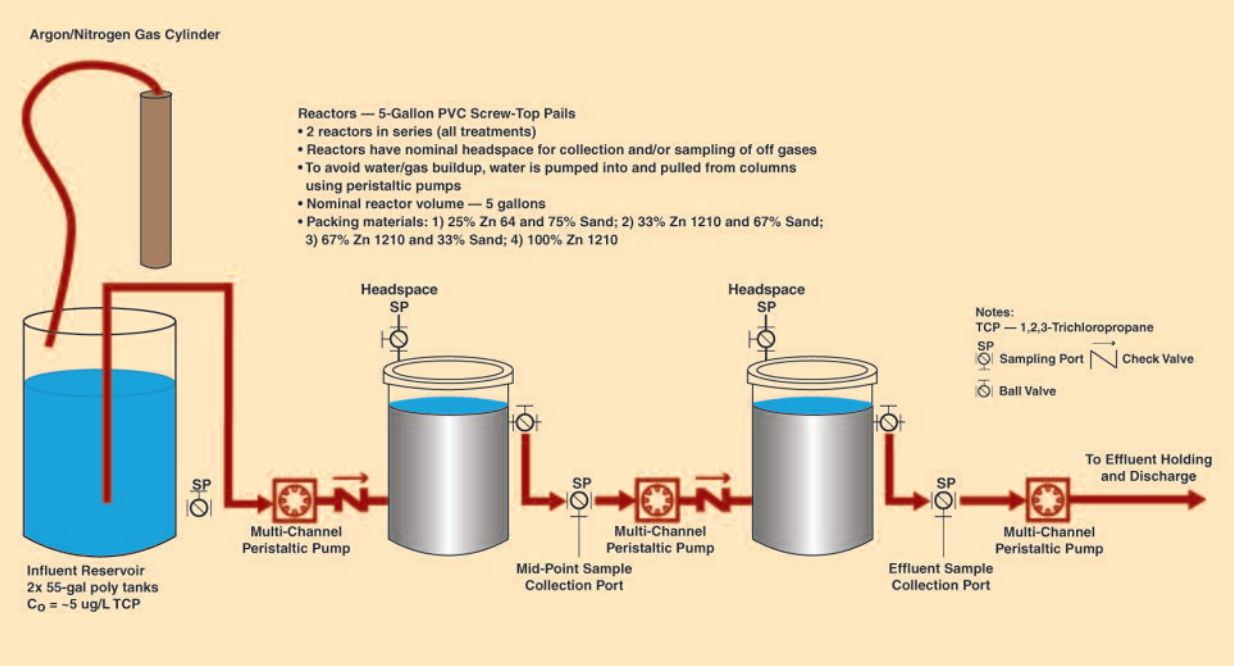
Information about how to access these various products is also provided on the NESDI web site at www.nesdi.navy.mil. Members of the TDWG can also be contacted for additional insights into these projects. (See back cover for a listing of all TDWG members.)

Abiotic Treatment of 1,2,3-Trichloropropane to Protect Drinking Water Resources (project #434)

TESTIMONIAL

"I want to thank the NESDI program for sponsoring this study. We were really scratching our heads trying to figure out how to remediate such a toxic, emergent, recalcitrant compound."

—Theresa Morley (Naval Facilities Engineering Command Southwest)



Schematic of optimized columns to treat TCP.

No.	Project	#	Description	Capabilities Gained
1.	**Biodetoxification of Oily Sludges**	**013**	This project demonstrated and validated the use of microbes in a Sequencing Batch Reactor (SBR) system to effectively treat concentrated oily sludge from petroleum tanks.	• Improved processing capability for oily waste sludge using a 10,000-gallon SBR system at Naval Station Pearl Harbor. • Significantly reduces the cost to dispose of this sludge.
2.	**Containment and Long-Term Monitoring Strategies for Contaminated Sediment Management**	**046**	This project generated a suite of integrated containment and monitoring strategies for contaminated sediment remedies and a web-based decision tool to evaluate the effectiveness of sediment remediation technologies.	• The Interactive Sediment Remedy Assessment Portal (ISRAP) on-line and accessible at www.israp.org. • Provides a means to select the most appropriate and cost-effective monitoring strategies for sediment remediation methods. • Provides a better understanding of specific monitoring requirements based on remedy selection.
3.	**Low Range Differential Pressure (LRDP) Leak Detection System for Bulk Fuel Storage Tanks**	**161**	This project led to the development of a mass-based system that allows for the early detection of small leaks before they impact groundwater.	• Leak detection capability is now available for all bulk fuel Underground Storage Tanks (UST), Above-ground Storage Tanks, and for 50,000-gallon USTs. • 3rd-party evaluated and EPA approved for monthly and annual monitoring requirements. • LRDP validated in Red Hill tanks. • LRDP installed at Naval Base Guantanamo Bay can reliably detect small leaks in new underground storage tanks.
4.	**No Foam™ System For Aircraft Hangar Fire Suppression System & Fire Fighting Pumper Trucks Foam Discharge Checks**	**240** **288**	These projects demonstrated and validated the effectiveness of the NoFoam™ system technology that minimizes Aqueous Film Forming Foam (AFFF) -generated wastewater resulting from annual testing of aircraft hangar fire suppression foam systems and fire fighting pumper trucks.	• A viable diagnostic tool for aircraft hangar fire suppression foam system discharge checks. • Significantly reduces the volume of AFFF laden wastewater.
5.	**Cleaning Solvents for the 21st Century**	**248**	As part of DoD's response to eliminating the use of volatile organic compounds and hazardous air pollutants, this project developed and sustained a Joint Service Solvent Substitution framework and methodology to be used for each solvent substitution effort.	• An approved Solvent Substitution Methodology is now in place. • New cleaner specifications — MIL-PRF-32296A (an alternative to MIL-PRF-680B) — A HAP-free general cleaning specification under development • Naval installations in air quality non-attainment areas can use these new generation cleaners and avoid the costly installation of air pollution control equipment.

Bench-scale column using zinc to treat 1,2,3-TCP.

Successful NESDI Projects

No.	Project	#	Description	Capabilities Gained
6.	**Underwater Ordnance Casing Corrosion**	**255**	This project developed an underwater corrosion prediction model for unexploded ordnance (UXO) that predicts "time to penetration" of UXO items in the marine environment, and produced a user's guide.	• UXO Corrosion Prediction Model is available that estimates the time of perforation for ammunition casings exposed to seawater for the lifespan of the ordnance. • A guidance document is available on the NESDI web site to help users implement the model at their facility. • This information helps Remedial Project Managers (RPM) decide if a potential risk exists with regards to munitions constituents at their underwater Munitions Response Program sites.
7.	**Toxicity/ Bioaccumulation of Munitions Constituents in the Marine Environment**	**258**	This project developed a comprehensive data set on the toxicity of munitions constituents to regulatory acceptable marine species, as well as conclusively defined potential bioaccumulation, cellular level impacts, and trophic transfer.	• Ability to assess and determine the risks from underwater UXO is now available for use on ranges, munitions response sites, and at ocean disposal sites. • Allows the Navy to avoid costly remediation efforts where mentioned constituents are at low levels and do not pose a threat to the environment.
8.	**Sediment Transport User's Guide**	**277**	This project provided a methodology as well as a publication and web-posting of The Sediment Transport User's Guide that provides RPMs with practical guidance for evaluating the transport of sediments at contaminated sites and further facilitates successful, cost-effective remedial decisions.	• Guidance to evaluate sediment transport at contaminated sediment sites and select the most cost effective remedies for those sites. • The Sediment Transport User's Guide (Technical Report (TR) 1960) is available on the Space and Naval Warfare Systems Center Pacific web site at http://www.spawar.navy.mil/sti/publications/pubs/tr/1960/tr1960cond.pdf.
9.	**Operational Range Clearance: Alternative Green Targets**	**289**	This project demonstrated and validated an alternative green tank target that lacks the hazardous components in tanks currently used on ranges. The green target is an effective replacement for the diminishing supply of M60 tanks.	• Alternative Live-Fire Ground Target—a new environmentally friendly, alternative hard target for live-fire practices—is now available. • Eliminates the risk of spills or hazardous materials associated with the current targets and any associated clean-up costs.

Evaluation of Re-suspension Associated with Dredging, Extreme Storm Events and Propeller Wash (project #448)

TESTIMONIAL

"Recontamination is important and the Navy is listed as a responsible party. Knowing what happens with the sediment is very important in determining whether sediment resuspension contributes to our liability, as well as the impacts it has to our site and others within the San Diego Bay."

—Brian Gordon (Naval Facilities Engineering Command Southwest)

No.	Project	#	Description	Capabilities Gained
10.	**Advanced Sealant Technologies**	329	This project demonstrated, validated and implemented alternative conductive gaskets and non-conductive seals/sealants for antennas, static wicks, floorboards and windscreens to further increase survivability in the Navy's corrosive and high fluid environments.	• Polyurethane gasket (manufactured by AvDEC) material for aircraft platforms now available. • Among the aircraft platforms currently using the technology are the C-130, EA-6B, F/A-18, H-53, H-60, and T-45. • Reduces corrosion problems associated with static wicks, antennas, and floorboards.
11.	**Advanced Anodizing Aircraft Parts Using Process Control Technology**	330	This project successfully demonstrated and integrated a process control technology which optimizes the application of anodized coatings, thereby reducing labor costs and hazardous waste generation.	• Approved anodizing process in place at the Fleet Readiness Center Southeast in Jacksonville, FL. • Results in increased consistency, throughput, verification, and improved corrosion performance of the component parts. • Reduces the generation of hazardous waste through the consolidation of bath chemistries and extended bath life. • Reduces worker exposure to hexavalent chromium through the use of a Trivalent Chrome Process (TCP) post treatment anodized sealer.
12.	**Direct-Push and Point-and-Detect, In Situ Sensor for Perchlorate**	353	This project validated the use of direct push and point-and-detect sensor systems for field use to measure perchlorate, eitherfor rapid screening and monitoring purposes or for contaminant source characterization of perchlorate in groundwater or surface waters.	• An in-situ direct push perchlorate sensor has been incorporated into Navy Site Characterization and Analysis Penetrometer System (SCAPS) trucks which allows for the real-time field measurement of perchlorate levels. • A user manual to help end users operate the sensor is available. • The Navy can now screen potential perchlorate contaminated sites quicker and at a lower cost than previous methods.
13.	**Real-Time Drinking Water Quality Monitoring Technology**	356	This system provides an early warning system to mitigate water safety concerns through real-time monitoring technology combined with automated data communication, reporting and event warnings.	• An early warning system to mitigate water safety concerns for operators at Naval Base Ventura County: — Rapidly assesses problems in the distribution system — Improves overall operations — Ensures regulatory compliance — Provides an enhanced level of security from potential threats to the base's drinking water system
14.	**Potable Water Quality Management: Disinfection Byproducts Users Guide**	361	The Potable Water Quality Management Guidance Document presents information and materials to help Navy installations meet and maintain compliance with the Stage 2 Disinfectants and Disinfection Byproducts and Long Term 2 Enhanced Surface Water Treatment (LT2) Rules. The document also serves to address issues resulting from operational or treatment changes related to these rules.	• A guide helps Navy installations identify how new regulations impact their potable water systems. • Identifies operational solutions and treatment technologies that allow for low cost compliance. • Links and references with detailed information help Navy installation managers implement these solutions.

Successful NESDI Projects

No.	Project	#	Description	Capabilities Gained
15.	**Predictive Aquatic Fate & Transport Model**	396	This project developed a predictive model that allows Navy water program managers to calculate Total Maximum Daily Loads as part of their efforts to bring water bodies back into compliance with Clean Water Act standards.	• Predictive aquatic fate and transport model • Determines which pollutants are of most concern in a specific water body. • Tailors BMPs to address only those site-specific concerns.
16.	**Prohibited and Controlled Chemical (PCCL) and NAVSEA Target Chemical (TCL) Lists**	399	This project resulted in a computer algorithm that generates a standard target chemical avoidance list that helps ship and shore facility compliance managers achieve their hazardous material minimization goals.	• A standard target chemical avoidance list to use in acquisition programs to reduce the hazardous materials usage. • PCCL has been integrated into the 2010 Naval Vessel Rules. • PCCL has been incorporated into the Navy's Strategic Environmental Goals Memorandum issued by CNO N45 on 29 July 2008. • PCCL is available on the Joint Services Pollution Prevention Technical Library. • A Defense Acquisition University course module, CLE 067—Strategic Material Selection: Chemical Ranking System—has recently been developed which includes the use of the PCCL.
17.	**Vertical Launch System (VLS) Wastewater Treatment System**	400	This project demonstrated a cost-effective treatment system for removing cadmium, lead, and cyanide in VLS wastewater that meets user requirements.	• A successfully demonstrated VLS Wastewater Management Unit. • Allows the fleet to re-load missile tubes anywhere in the world and not be burdened with the high cost to dispose of missile tube wastewater.
18.	**Compwater Fuel Ballast Water Treatment**	401	The barge mounted system developed under this project captures compwater from refueling operations and later removes the oil and metal contaminants so that the effluent can be discharged into a sanitary sewer system.	• The system allows for the in-port refueling of destroyers where zero discharge regulations exist. • Removes oils from the waste stream at a fraction of the cost of conventional shore side systems. • The system is in routine use at Naval Station Everett, WA.
19.	**Cadmium Alternatives Navy Specific Testing**	408	A Joint Test Protocol was developed (with leveraged investment from ESTCP) for the replacement of Cadmium on high strength steel. Three coatings were evaluated including Sputtered Aluminum, Electroplated Aluminum (Alumiplate℠), and Low Hydrogen Embrittlement Zinc-Nickel. At the conclusion of the testing, NAVAIR approved the use of Alumiplate℠ as a Cadmium replacement on high strength steel (but not for fasteners or electrical connectors).	• A NAVAIR approved substitute to Cadmium for coatings on high strength steel. • Supports DoD's goal to minimize the use of Cadmium on its weapons systems and platforms.

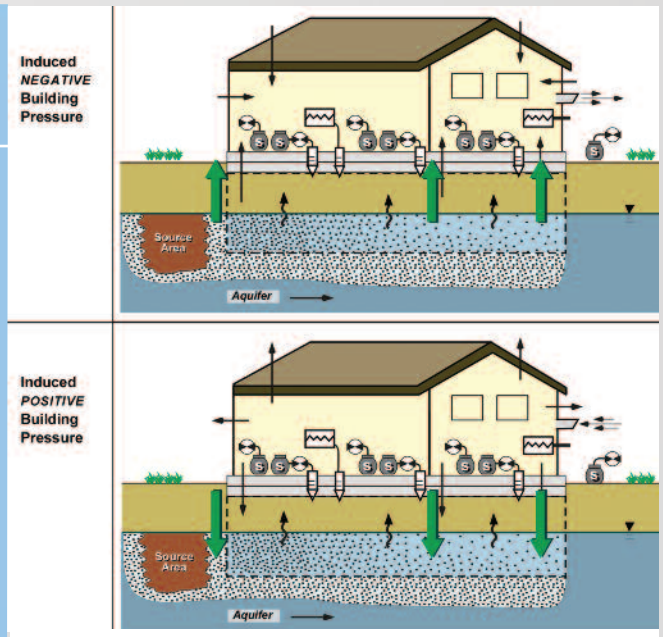
No.	Project	#	Description	Capabilities Gained
20.	**Metals Removal from Stormwater Using Linear Treatment System**	430	This project demonstrated and validated the effectiveness of an above-grade linear treatment BMP to remove pollutants from storm water generated at industrial sites.	• An above-grade linear treatment BMP to remove pollutants from storm water. • The Navy will have the capability to meet more stringent performance objectives including removal of metals and total suspended solids at adequate hydraulic flow capability.
21.	**Assessing Climate Change-Related Impacts on U.S. Navy Installations Initiation Decision Report**	436	This report provides an assessment of potential climate-change impacts on Navy installations and provides recommendations to support Navy readiness.	• Provides insights into opportunities for technology and management strategies that support Navy readiness and meet the challenges of anticipated climate change and greenhouse gas regulatory requirements. • Becomes the basis for the roadmap to address climate change issues.
22.	**Predictive Trajectory Model for Oil Spills for Navy Harbors**	438	This project will provide a validated modeling tool for the Navy On-Scene Coordinators with accurate information to manage oil spill scenarios, for both pre-scenario planning and post-scenario response/analysis,	• Capability to predict oil spill trajectories in Pearl Harbor and San Diego Bay with data also available for Sinclair Inlet. • Enables on-scene coordinators to better execute clean-up operations.
23.	**Evaluation of Re-suspension Associated with Dredging, Extreme Storm Events and Propeller Wash**	448	This project will demonstrate and validate innovative methods to quantify resuspension and recontamination potential of contaminated sediments from propeller wash.	• Ability to predict propeller wash and its effects on sediments to include re-suspension, remigration, recontamination, and sediment cap effectiveness and stability. • Enables RPMs to determine where remediation efforts need to be focused to avoid contaminated sediments from spreading and increasing clean-up costs.

Improved Assessment Strategies for Vapor Intrusion (project #424)

TESTIMONIAL

"This research has and will continue to save the Navy money, mostly through cost avoidance. We won't have to chase vapor intrusion ghosts with very expensive sampling."

—Donna Caldwell
(Naval Facilities Engineering Command, Atlantic Division)



How vapor intrusion works.

The NESDI Program

Participating Organizations

Over the years, a range of organizations from across the Navy and elsewhere have supported the NESDI program in one way or another. In addition to the program's resource sponsor (CNO N45) personnel from the following organizations supported the program in the following ways:

- **Attending an IPR**
- **Submitting or ranking a need**
- **Submitting or ranking a pre- or full proposal**
- **Contributing to the progress of the project**
- **Providing ad hoc advice and guidance**
- **Logging onto the program's web site**

How You Can Participate

The NESDI program relies on all Navy personnel to help identify environmental concerns and support the mplementation of resultant solutions. We ask that, wherever possible, you find a way to use NESDI products. Participate in our process—you can play a vital role by:

- Submitting and validating environmental needs
- Reviewing technologies already in development
- Supporting transition efforts in your organization or at your installation
- Acting as a Principal Investigator on one of our projects
- Providing demonstration sites for our various projects
- Staying up-to-date by regularly visiting our web site

1. Aberdeen Proving Ground
2. Applied Research Laboratory, Pennsylvania State University
3. Commander, Navy Installations Command
4. Commander, Navy Region Europe, Africa, Southwest Asia
5. Commander, Navy Region Northwest
6. Commander, Navy Region Southwest
7. Commander, U.S. Atlantic Fleet
8. Commander, U.S. Pacific Fleet
9. Fleet Readiness Center East
10. Fleet Readiness Center Southeast
11. Fleet Readiness Center Southwest
12. Marine Corp Mountain Warfare Training Center
13. Marine Corps Base Camp Pendleton
14. National Institute for Standards and Technology
15. National Oceanic and Atmospheric Administration
16. Naval Air Engineering Station Lakehurst
17. Naval Air Station Corpus Christi
18. Naval Air Station Fallon
19. Naval Air Station Jacksonville
20. Naval Air Station Key West
21. Naval Air Station Kingsville
22. Naval Air Station Patuxent River
23. Naval Air Systems Command Headquarters
24. Naval Air Systems Command, Design Interface and Maintenance Planning
25. Naval Air Systems Command, Environmental Programs Department
26. Naval Air Warfare Center—Aircraft Division Lakehurst, NJ
27. Naval Air Warfare Center—Aircraft Division Patuxent River, MD
28. Naval Air Warfare Center—Weapons Division China Lake, CA
29. Naval Base Kitsap Bangor
30. Naval Construction Battalion Center, Gulfport, MS
31. Naval Facilities Engineering Command
32. Naval Facilities Engineering Command Atlantic
33. Naval Facilities Engineering Command Hawaii
34. Naval Facilities Engineering Command Headquarters
35. Naval Facilities Engineering Command Headquarters, Capital Improvements
36. Naval Facilities Engineering Command Headquarters, Public Works Department, Base Support Vehicle and Equipment
37. Naval Facilities Engineering Command Headquarters, Asset Management
38. Naval Facilities Engineering Command Northeast
39. Naval Facilities Engineering Command Southeast
40. Naval Facilities Engineering Command Southwest
41. Naval Facilities Engineering Command Northwest
42. Naval Facilities Engineering Command Headquarters, Environmental Restoration
43. Naval Facilities Engineering Command, Mid-Atlantic
44. Naval Facilities Engineering Command, Pacific
45. Naval Facilities Engineering Command, Solid Waste Management Program
46. Naval Facilities Engineering Command, Southeast—U.S. Naval Station Guantanamo Bay
47. Naval Facilities Engineering Command, Southwest Region Fleet Transportation, Marine Corps Recruit Depot
48. Naval Facilities Engineering Command, Washington
49. Naval Facilities Engineering Service Center
50. Naval Facilities Command Marianas
51. Naval Inventory Control Point, Philadelphia
52. Naval Research Laboratory
53. Naval Sea Systems Command Headquarters
54. Naval Sea Systems Command, Contaminated Water Program
55. Naval Station Everett
56. Naval Station Keyport
57. Naval Station Rota
58. Naval Supply Systems Command, Asset Protection and Pollution Prevention
59. Naval Supply Systems Command, Fleet Industrial Supply Center
60. Naval Support Activity Crane
61. Naval Support Activity Panama City
62. Naval Surface Warfare Center—Carderock Division
63. Naval Surface Warfare Center—Dahlgren Division
64. Naval Surface Warfare Center—Indian Head Division
65. Naval Surface Warfare Center—Newport Division
66. Naval Surface Warfare Center—Philadelphia Division
67. Naval Surface Warfare Center—Washington, DC
68. Naval Weapons Station Seal Beach Detachment Fallbrook
69. Navy Alternative Fuels Program
70. Navy Environmental Health Center
71. Navy Region Center Singapore
72. Norfolk Naval Shipyard
73. Pearl Harbor Naval Shipyard
74. Portsmouth Naval Shipyard
75. Puget Sound Naval Shipyard & Intermediate Maintenance Facility
76. San Diego State University
77. Ship Repair Facilities and Japan Regional Maintenance Center
78. Space and Naval Warfare Systems Command, Systems Center Pacific
79. Space and Naval Warfare Systems Command, Undersea Surveillance
80. Stanford University
81. Submarine Base Kings Bay
82. Submarine Base San Diego (Point Loma)
83. U.S. Coast Guard
84. U.S. Fleet Forces Command
85. University of California at Santa Barbara
86. University of California at Los Angeles
87. USS George Washington
88. Virginia Class Program Office

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If you don't already, you should subscribe to our newsletter—*NESDI News: Highlights & Happenings*—distributed electronically each quarter.

This publication brings to the forefront recent technical achievements and regulatory concerns, along with highlights of our technical staff.

To subscribe, send an email to Lorraine Wass at ljwass@surfbest.net and stay up to date on the latest news from the NESDI program.

Who to Contact

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Our Web Site

For up-to-date information about NESDI-sponsored R&D projects and to participate in the ongoing execution of the program, visit the NESDI program web site at www.nesdi.navy.mil.

You can also contact our webmaster, Eric Rasmussen, at 732-323-7481 and eric.rasmussen@navy.mil.

PRINTED: Summer 2012