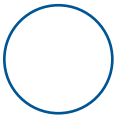
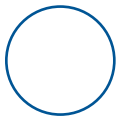
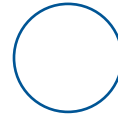
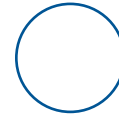
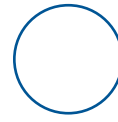


BRINGING THE NESDI PROGRAM TO THE CUSTOMER

Accomplishments of the
Navy Environmental Sustainability
Development to Integration Program
in Fiscal Year 2008



A Word From the Program Manager



Welcome to the Fiscal Year (FY) 2008 Year in Review report for the Navy Environmental Sustainability Development to Integration (NESDI) program.

An Eye to the Future: Three pivotal actions are the backbone of the NESDI Program: namely, targeted high priority requirements, project execution, and the Fleet integration of our products. We continue to enhance and refine the reach of our requirements collection and prioritization efforts through the partner expansion with Navy Functional Working Groups (listed later in this report). We also initiated two Initiation Decision Reports (IDR) in FY08 and three more in FY09 to help the Navy better understand key environmental challenges facing the Fleet. In FY08, our two IDRs focused on “Climate Change Impacts on Navy Shoreside Navy Operations” and “Shipyard Sustainability.” In FY09 and beyond, we will initiate IDRs in “Operational Range Sustainment,” “Environmental Effects of Underwater Ordnance” and “Pier side Underwater Ship Husbandry.” We utilize the results of these IDRs to help plan for, and make targeted investments, and to build partnerships to develop innovations to ensure Fleet readiness.

Project Execution and Product Integration: We enhanced our web site to be more efficient in project tracking and refine our electronic tools and training to ensure that our project Principal Investigators work effectively with their customers to ensure our products and services are integrated into the Fleet. Ultimately, we must integrate, to the fullest extent possible, NESDI program products into the Fleet. To make sure this occurs, our projects are always executed and evaluated with an eye toward integration. All our projects utilize our Technology Integration Planning tool that is designed to ensure that integration efforts for all project are addressed upfront and early. Our Principal Investigators involve end users throughout the development process to ensure that technical and performance requirements are met and that users have the time they need to plan for the proper integration of our products. Twice a year, integration milestones are reviewed for all of our projects - before a new project is started (and funding is received) through one year after the completion of the project. This ensures that integration milestones are identified early on in the process, that integration requirements are front and center, appropriately funded and addressed during the project, and that results are validated and documented.

Collaboration: With the ongoing effort to be more effective and efficient, the power of collaboration and leveraging is essential to the NESDI program's success. Wherever possible, we reached into our user community and other program sponsors to leverage project resources appropriately. The results were impressive in FY08 with a total cost sharing of \$2.8 million. This is a testament to the need and urgency of the NESDI program's investments.

Finally, on behalf of the NESDI program sponsor – the Chief of Naval Operations Environmental Readiness Division (N45), I'd like to thank all of the System Command program participants including the Technology Development Working Group (TDWG) representatives, Functional Working Group members, and project Principal Investigators, engineers, scientists and technicians that support the NESDI program. Their professionalism, dedication and support are crucial to the continued success of the program. If you would like to participate in the NESDI program, please contact me directly or your TDWG representative (see the following page). I hope the content of this report encourages you to participate in the program in FY09 and for years to come.

Best Regards,



Scott Mauro, P.E.
Program Manager

Naval Facilities Engineering Command,
Environmental Shoreside 6.4 Research
and Development (0817)

Navy Environmental Sustainability
Development to Integration Program





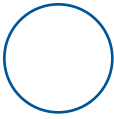
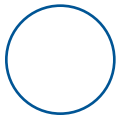
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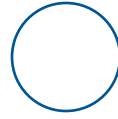
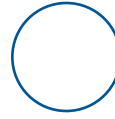
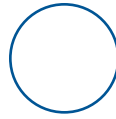
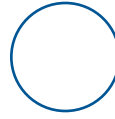
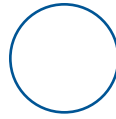
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Document preparation assistance and graphic design services were provided by Bruce McCaffrey Consulting, Inc. under General Services Administration contract number GS-10F-0375K.

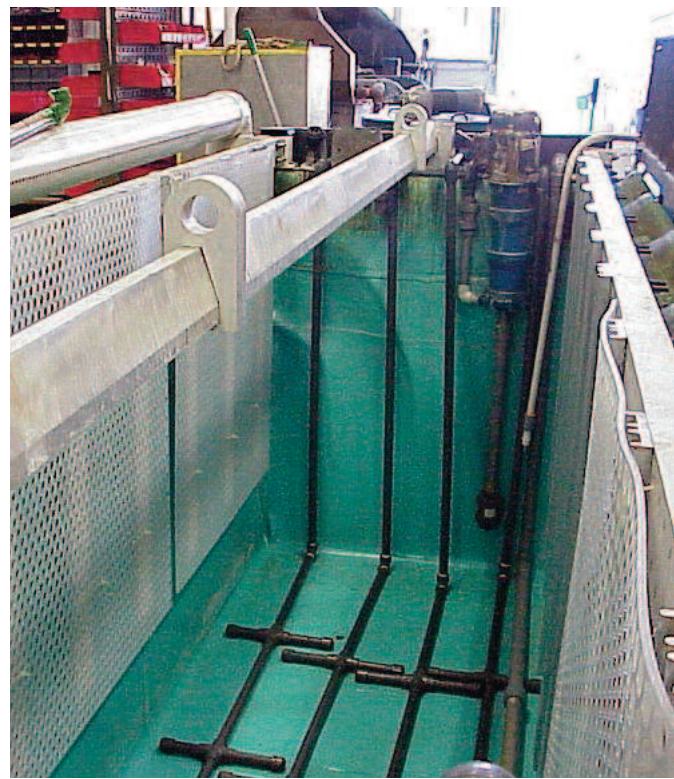
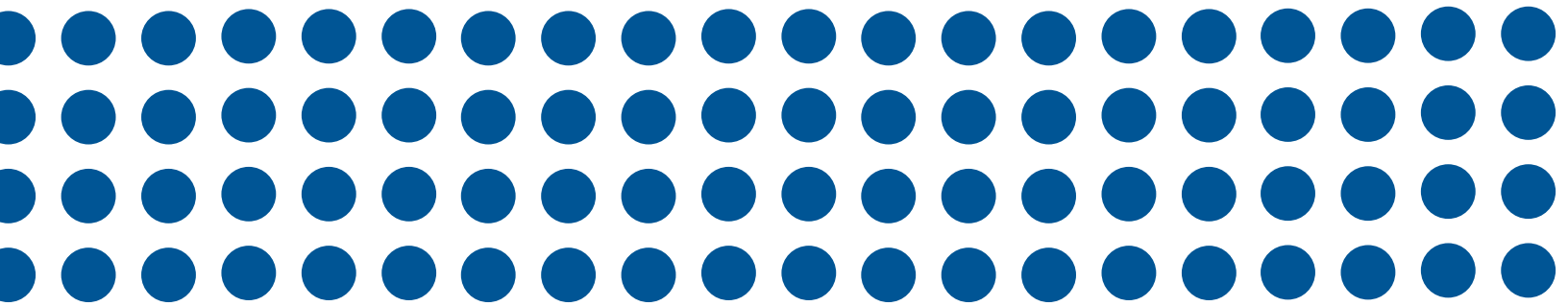
An electronic copy (pdf) of this and previous Year in Review reports are available for download from the NESDI program web site at www.nesdi.navy.mil.



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EXECUTIVE SUMMARY

Milestones achieved in the NESDI program in FY 2008 include the following:

- Make investments based on Fleet requirements,
- Maintain a collaborative management approach,
- Conduct program reviews to ensure successful project execution,
- Integrate a critical mass of projects
- Make in-roads into the range community,
- Engage the Ship-to-Shore community,
- Understand climate change impacts on the Navy shore community,
- Improve the efficiency of the program,
- Assess the economic impact of program-sponsored projects,
- Align the program with Navy shore-operation challenges,
- Expand the collection of needs and proposals, and
- Leverage resources and expertise of other technology demonstration programs.

Three pivotal actions are the backbone of the NESDI program: namely, targeted high priority requirements, project execution and the Fleet integration of our products.



Comprehensive Environmental Compliance Approach for Cathodic Protection in Caissons and Floating Dry Docks

This NESDI project verified the status of discharge practices, monitoring data, and guidance, assessed the nature and extent of metal contamination, and facilitated the implementation of cathodic protection systems that provide effective corrosion prevention while reducing environmental impacts in caisson and floating dry dock ballast discharges. As a result of this project, the Navy will improve cathodic protection of ship technology in minimizing zinc metal wastage (or discharge) by improving tank coatings and designing cathodic protection systems to minimize over-conservative uses of anode metals (zinc, aluminum). The Pearl Harbor Naval Shipyard is in the process of replacing all of its current caissons and floating dry docks containing zinc anodes with aluminum alloy based anodes during normally scheduled maintenance cycles and system overhauls. A guidance document for each naval facility will be developed on the implementation and use of alternative or reduced zinc corrosion protection systems in caissons and floating dry docks.

Completed Projects

In FY08, the following NESDI projects were well on their way to successful integration across the Fleet:

1. **Containment and Long-Term Monitoring Strategies for Contaminated Sediment Management.** Provides the Navy with a suite of integrated containment and monitoring strategies for remediating contaminated sediments and assessing the long-term effectiveness of remedial actions.
2. **No Foam™ System for Aircraft Hangar Fire Suppression System Foam Discharge Checks.** Demonstrated and validated the effectiveness of the NoFoam™ System technology in minimizing or eliminating the Aqueous Film Foaming Foam-generated wastewater from aircraft hangar fire suppression foam system annual discharge checks.
3. **Toxicity & Transport of Munitions Constituents in the Marine Environment.** Providing the Navy with the scientific information and tools needed to evaluate the environmental impacts and transport of underwater unexploded ordnance at current and past operations along shorelines, at coastal sea ranges and within rivers, harbors and estuaries.
4. **Underwater Unexploded Ordnance Risk Assessment Tool.** Conducted a baseline ecological risk assessment using an approved U.S. Environmental Protection Agency methodology to document the effect or lack of effect of underwater munitions constituents to media, organism toxicity, bioaccumulation and community structure.
5. **Recycling of Acid Waste from Pipe Flushing on Submarines and Surface Ships.** Identified technology alternatives and selected a candidate pier side integrated system for recycling and reusing acid/heavy metal wastewater generated in submarine and surface ship pipe flushing operations and submarine missile tube cleaning.
6. **Ecological Soil Screening Levels for Invertebrates and Plants Exposed to Munitions Constituents.** Developed the dataset necessary to calculate Ecological Soil Screening Levels for munitions and explosive related chemicals often needed to support range-related mitigation measures.

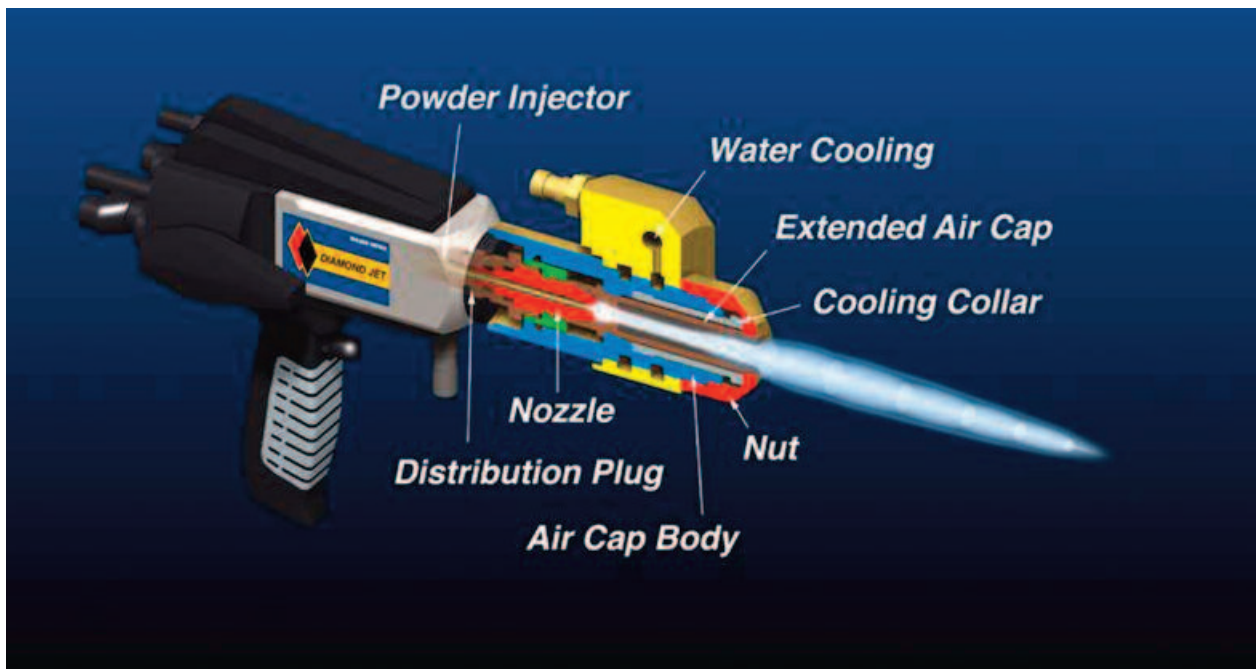


We are integrating aquatic fate and transport models into a single accurate and fast predictive tool.

7. **Environmentally-Friendly Aircraft Radome Repair.** Evaluated the effectiveness of epoxy resin and corn hybrid polymer media as viable procedural alternatives for use on aircraft radome repair.
8. **Advanced Anodizing Using Process Control Technology.** Demonstrated and validated the Metalast™ anodizing technology using advanced process control for processing of Type II and III coatings within a one-tank system and further evaluated capabilities for producing Type IIB (Type I alternative) coatings using the same system and bath chemistry.
9. **Direct-Push and Point-and-Detect In Situ Sensors for Perchlorate.** Demonstrated and validated the field use of a direct push and point-and-detect sensor system for measuring perchlorate either for rapid screening and monitoring purposes or for contaminant source characterization of perchlorate in groundwater or surface waters.



10. **Pollutant Source Tracking.** Accurately quantifying Navy contaminant loads by identifying, reviewing, demonstrating and validating contaminant source tracking technologies.
11. **HVOF Thermal Spray as an Alternative to Chromium Electroplating on Helicopter Dynamic Components.** Demonstrated and validated the use of High Velocity Oxygen Fuel (HVOF) coatings as a replacement for hard chromium plating on helicopter dynamic components.
12. **Predictive Aquatic Fate and Transport Model in Support of TMDL and Compliance.** Integrated/ing relevant models into a single accurate and fast predictive software tool that can be used for addressing most of the Navy's marine and estuarine fate and transport issues under the Total Maximum Daily Load (TMDL) umbrella.



13. **Prohibited and Controlled Chemical List and Target Chemical List.** Provide the Navy with standard chemical inventories for both weapon system program and facility operations managers to use to improve their hazardous material management and minimization efforts.
14. **Cadmium Alternatives Navy Specific Testing.** Conduct Navy-specific tests, utilize test data to identify the most promising cadmium alternative coatings and make implementation recommendations to Navy depots, acquisition programs and Original Equipment Manufacturers (OEM).
15. **Dredge Spoil Management Alternatives.** Identified the Navy sites requiring dredging, determined the potential beneficial reuse of the dredged material from these sites and evaluated the viability of using contaminated dredge spoils as a cement kiln feed stock.
16. **Plastic Waste Shoreside Disposal and Recycling.** Minimizing the landfill disposal of Plastic Waste Processor (PWP) disks and developing partnerships with the private sector to receive and process PWP disks into useful feedstock for manufactured products or fuel in waste-to-energy conversion systems.
17. **Comprehensive Environmental Compliance Approach for Cathodic Protection in Caissons and Floating Dry Docks.** Verified the status of discharge practices, monitoring data, and guidance, assessed the nature and extent of metal contamination and facilitated the implementation of cathodic protection systems that provide effective corrosion prevention while reducing environmental impacts in caisson and floating dry dock ballast discharges.
18. **Shipyard Environmental Sustainability Initiative.** Documents current challenges and defines potential environmental investment areas to maintain shipyard productivity and compliance.

High Priority Fleet Needs

In FY08, the NESDI program's needs collection and evaluation processes resulted in the following 15 high priority needs:

1. Determining the Phototoxic Properties of Energetic Contaminants in Aquatic Environments
2. Optimizing Cable Routes at Navy Underwater Ranges to Minimize Installation Costs and Associated Environmental Impacts
3. Long-Term Monitoring Capabilities to Support Natural Resource Management on Navy and Marine Corps Installations and Ranges
4. Background Perchlorate Source Characterization at Navy Facilities and Ranges
5. Hull Bio-Fouling Cleaning/Removal
6. Evaluation of Solvent Extraction Methodologies for the Extraction of Polychlorinated Biphenyls in Shipboard Materials
7. Tools/Mitigation Measures for Coating Operations on Vessel Freeboard Areas
8. Chromate-Free Corrosion Inhibiting Conformal Coatings
9. Environmentally Friendly Alternative to FC-77 Electronic Liquid Coolant on the E-2C
10. Surface Cleaning of Dry Dock Floors
11. Reduced Generation of Shoreside Managed Waste from Pierside Supported Underwater Ship Husbandry Operations
12. Making Man-made Structures and Altered Habitats in Urban Areas of Navy Harbors More Habitable by Native Species Without Compromising Structural Integrity
13. Abiotic In Situ Treatment of 1,2,3-Trichloropropane to Protect Drinking Water Resources
14. Waste to Clean Energy (WtCE) Project
15. Assessing Climate Change Related Impacts on U.S. Military Installations

HVOF Thermal Spray as an Alternative to Chromium Electroplating on Helicopter Dynamic Components

This NESDI project demonstrated and validated the use of HVOF coatings as a replacement for hard chromium plating on helicopter dynamic components. This HVOF replacement technology would reduce worker exposure and reporting requirements. The initial transition of this new technology was applied to H-46 helicopter transmission components. Since the successful implementation on the H-46, other helicopter platforms, including the H-53, have identified candidate components. All engineering documentation will be modified to reflect the approved use of HVOF for repairs.



Make Investments Based on Fleet Requirements



Evaluating the Environmental Impacts of Underwater Unexploded Ordnance

The NESDI program is sponsoring a range of projects to provide the Navy with the necessary scientific information and tools needed to evaluate the environmental impacts of underwater unexploded ordnance at existing and past operations along shorelines, at coastal sea ranges, and within rivers, harbors and estuaries.

- i. Underwater Ordnance Casing Corrosion.
- ii. Underwater Ordnance Burial and Un-burial.
- iii. Degradation Processes of Munitions Constituents in Marine Matrices (Sediment & Water).
- iv. Toxicity/Bioaccumulation of Munitions Constituents in the Marine Environment.

FY09 Project New Starts

The NESDI program identified the following five efforts for funding in FY09 and beyond:

1. **Motion Assisted Environmental Enclosure for Hull Bio-Fouling Cleaning/Removal in Dry Docks.** The purpose of this effort is to design, develop and demonstrate an improved containment enclosure system to capture the backspray and overspray from hull cleaning operations using an aerial work platform.
2. **Surface Cleaning of Dry Dock Floors.** This effort will include an Initiation Decision Report (IDR) to conduct a site survey, complete a market analysis on technologies, expedite contract actions, and provide technical direction over the equipment procurements, technology integration, and pre-testing of equipment.
3. **Predictive Trajectory Model for Oil Spills for Navy Harbors.** The purpose of this effort is to implement and link two existing models, the National Oceanic and Atmospheric Administration's (NOAA) General NOAA Operational Modeling Environment (GNOME) model and the Navy's Curvilinear Hydrodynamics in 3-dimensions (CH3D) model to predict oil trajectory following oil spills in three Navy harbors.
4. **Waste to Clean Energy (WtCE) IDR.** This IDR will address WtCE technology for Navy-wide potential implementation. The IDR will include the development of model WtCE case studies to facilitate technology implementation at different Navy regions and/or installations.
5. **Abiotic In Situ Treatment of 1,2,3-Trichloropropane (TCP) to Protect Drinking Water Resources.** The scope of this project includes assessment of the potential for TCP cleanup by the whole range of chemical oxidation and reduction processes.

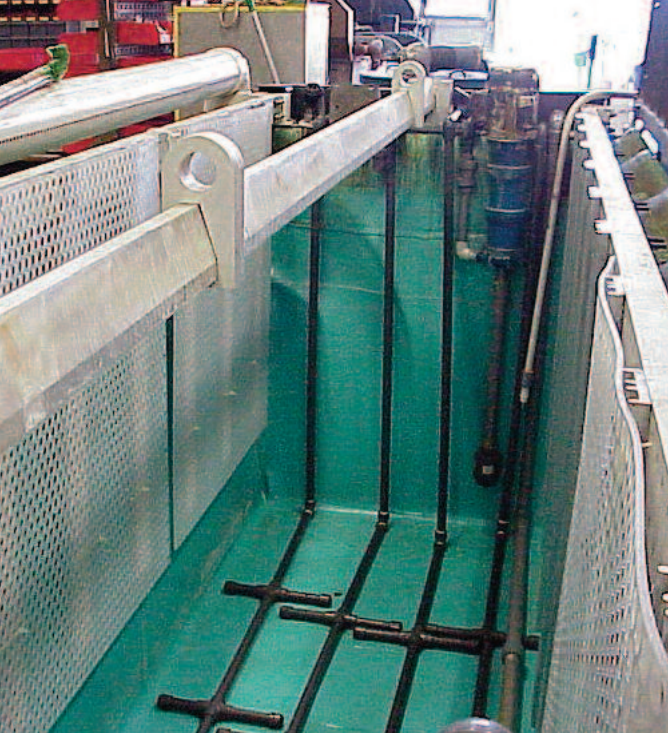


INTRODUCTION

The execution of the NESDI program in FY08 was defined by the following significant efforts and events:

- Make investments based on Fleet requirements,
- Maintain a collaborative management approach,
- Conduct program reviews to ensure successful project execution,
- Integrate a critical mass of projects
- Make in-roads into the range community,
- Engage the Ship-to-Shore community,
- Understand climate change impacts on the Navy shore community,
- Improve the efficiency of the program,
- Assess the economic impact of program-sponsored projects,
- Align the program with Navy shore-operation challenges,
- Expand the collection of needs and proposals, and
- Leverage resources and expertise of other technology demonstration programs.

Our Principal Investigators involve end users throughout the development process to ensure that technical and performance requirements are met.



Advanced Anodizing Using Process Control Technology

This NESDI project demonstrated and validated the Metalast™ anodizing technology using advanced process control for processing of Type II and III coatings within a one-tank system and further evaluated capabilities for producing Type IIB (Type I alternative) coatings using the same system and bath chemistry. The Metalast™ technology reduces operator supervision of the process and eliminates human error, reduces cycle or throughput times, improves accuracy and repeatability, reduces defects and rejects and reduces waste. This project also evaluated the use of a non-hexavalent chrome post sealer as a potential replacement to existing dichromate sealing of the above coating types. Efforts are underway to obtain the necessary approval to adopt the technology at other Navy Fleet Readiness Centers (FRC). This technology will be implemented for use at the FRCs via Local Process Specifications.

The NESDI program is the Navy's environmental 6.4 research and development (R&D) demonstration and validation (dem/val) program, sponsored by the Chief of Naval Operations Environmental Readiness Division (N45) and managed by the Naval Facilities Engineering Command (NAVFAC). The program supports Fleet readiness by minimizing operational risk, constraints and costs while ensuring shore-based environmental stewardship and regulatory compliance. The program seeks to accomplish this mission through the evaluation of cost-effective technologies, processes, materials and knowledge and ensuring those elements can be integrated into weapons system acquisition programs, with the ultimate goal of enhancing the environmental readiness of naval shore activities.

Primary Program Objectives

The NESDI program is focused on three primary objectives:

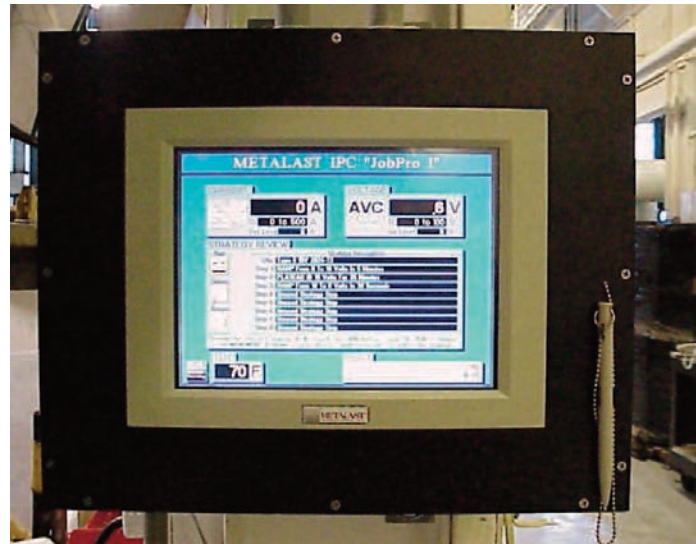
1. **Collect, Validate & Rank Environmental Research, Development, Test & Evaluation (RDT&E) Needs.** The NESDI program expands awareness of opportunities within the Navy shoreside community to encourage and facilitate the submittal of well-defined environmental needs and requirements.
2. **Resolve High Priority Needs.** The NESDI program seeks to ensure that program investments and the resulting RDT&E projects maintain a direct and consistent link to the defined needs.
3. **Integrate Solutions & Validate Benefits.** The NESDI program also works to maximize the number of program-derived solutions that are successfully integrated into the Fleet and future weapons system acquisitions and verify that the solutions provide the anticipated benefits.

The NESDI program supports Fleet readiness by minimizing operational risk, constraints and costs.

Priority Investment Areas

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

1. **Range Sustainment.** In the area of range sustainment (EEC-2), the NESDI program invests in innovations that address environmental impacts and restrictions at Navy ranges to ensure that Naval training ranges and munitions testing/manufacturing ranges are fully available and efficiently utilized. An example of a NESDI project in the range sustainment area is the work the program is doing to assess the environmental effects of abandoned equipment in the Navy's ocean ranges.



*Invest in Innovations
at Navy Ranges*

2. **Ship-to-shore Interface.** In the ship-to-shore interface (EEC-4) arena, the NESDI program seeks to develop innovative techniques to manage ship hazardous material/waste offload to shore facilities. An example project in this EEC area is the development and validation of an in-port ballast water treatment system.
3. **Weapon System Sustainment.** The focus of this area (EEC-3) is on the organizational- and intermediate-level Fleet maintainer with the overall objectives of reducing the cost of compliance and increasing Fleet readiness. Example projects include:
 - a. Validating the use of alternative technologies (including corn hybrid polymer) for the effective repair of aircraft radomes, and
 - b. Demonstrating and validating the use of High Velocity Oxygen Fuels (HVOF) coatings as a replacement for hard chromium plating on helicopter dynamic components.
4. **Air and Port Operations.** In this area (EEC-4), the NESDI program sponsors projects pertaining to air and port operations that ensure Fleet readiness. Example projects in this EEC area include:



- a. Validating a cathodic protection system to achieve effective corrosion prevention while reducing environmental impacts of caisson and floating dry dock ballast discharges, and
 - b. Assessing 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.
5. **Regulatory and Base Operations.** In this area (EEC-5), the NESDI program provides cost-effective methods for identifying, analyzing and managing environmental constraints related to current and projected regulatory impacts. Example projects include:
- a. Establishing guidelines and limitations for the use of biodiesel in ground tactical vehicles and equipment, and
 - b. 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.

The NESDI program is working to achieve effective corrosion prevention while reducing impacts of caisson and floating dry dock ballast discharges.



ACCOMPLISHMENTS

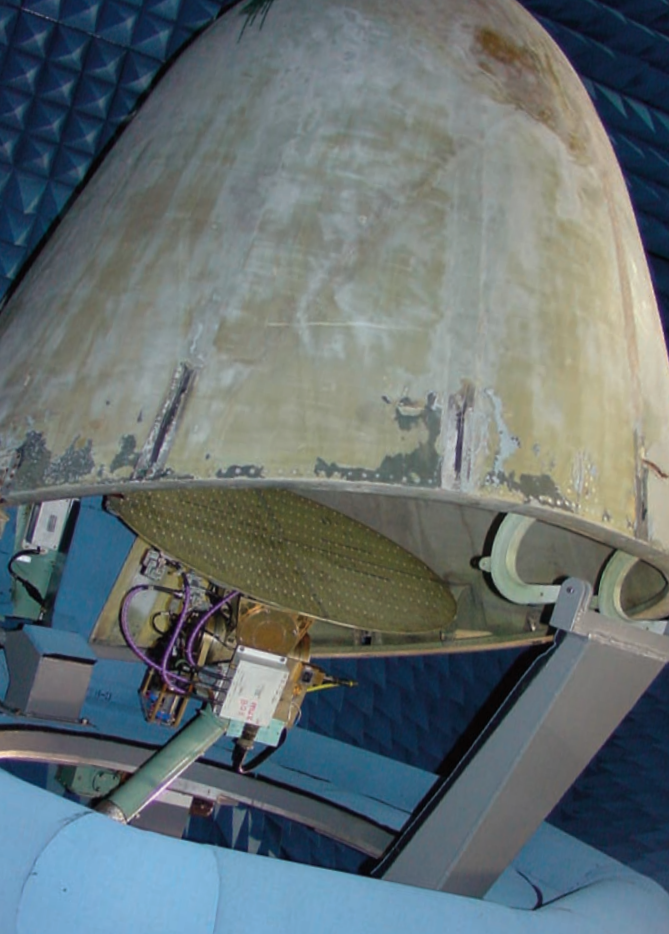
Continued successful collaborations across the Navy helped to guarantee the ongoing success of the NESDI program in FY08.

Investments Based on Fleet Requirements

In FY08, as in past years, the NESDI program continued to base its management decisions and investments based on documented Fleet operational requirements.

Through the involvement of various Navy environmental Functional Working Groups (FWG), the NESDI program enhanced the Navy's capability to better understand and document the environmental risks associated with Fleet operations. In FY08, a total of nine Navy FWGs were involved in identifying, collecting and ranking Fleet operational needs. FWGs are comprised of Fleet personnel or the representatives that address issues related to a specific area of Fleet operations. The following FWG support is instrumental to the continued success of the NESDI program:

- **Range Sustainment**
 - The Range Commanders Council
 - The Range Support Group
 - The Underwater Range Sustainment Group
- **Weapons System Sustainment**
 - The Navy Aviation Technology Integration Program
 - The Naval Sea System Command's (NAVSEA) Pollution Prevention (P2) Working Group
- **Air and Port Operations**
 - NAVFAC's Clean Air Act (CAA), Clean Water Act (CWA), and TMDL Working Groups
 - The Risk Assessment Working Group (RAW)
 - The Alternative Restoration Technology Team (ARTT)
- **Base and Regulatory Compliance**
 - NAVFAC's CAA, CWA, and Safe Drinking Water Act (SDWA) Working Groups
 - The Petroleum, Oil and Other Hazardous Substances Working Group
 - The RAW
 - The ARTT



Environmentally-Friendly Aircraft Radome Repair

This NESDI project evaluated the effectiveness of epoxy resin and corn hybrid polymer media as viable procedural alternatives for use on aircraft radome repair. This project resulted in the removal of suspected carcinogen styrene in radome repair via maintenance manual changes and eliminated Volatile Organic Compounds, excess hazardous waste/wastewater and worker contact with hazardous materials by switching to corn hybrid polymer. After approvals and field demonstrations, transition will be provided through modifications to the Aircraft Radomes and Antenna Covers maintenance manual, other specifications and Fleet Support Team approvals.

Collaborative Management Approach

The management philosophy adopted by the NESDI program manager and the program's Technology Development Working Group (TDWG) is characterized by the following statements. The NESDI program encourages:

- Collaboration among program personnel, its Principal Investigators, customers and the Fleet,
- Engagement with other potential customers in communities outside of the traditional audience for the program,
- Leveraging of personnel and financial resources of other R&D programs,
- An open door that welcomes to the table everyone with a potential interest, and
- The free flow of information among participants.

In FY08 as in previous years, the NESDI program tapped the requisite expertise from each System Command (SYSCOM) to ensure balanced participation and a more direct connection to the Fleet through each individual SYSCOM representative. The TDWG has representatives from Navy SYSCOMs including the Naval Air Systems Command (NAVAIR), the Naval Sea Systems Command (NAVSEA), NAVFAC, and the Space and Naval Warfare Systems Command (SPAWAR). The success of this approach, supported and embraced by each SYSCOM, is demonstrated by the following accomplishments:

- The TDWG collected and reviewed 91 responses to the program's FY08 needs solicitation and developed a list of 17 highly ranked needs.
- The TDWG reviewed 26 pre-proposals and 19 proposals for funding consideration. These reviews ensured that proposed projects would successfully achieve technology integration.
- The TDWG selected five FY09 project new starts that best met the collective needs of the program. (See table on next page.)

Proposed FY09 Project New Starts

The review and ranking of proposals received for consideration by the NESDI program in FY08 resulted in the following five proposed new efforts for initiation in FY09:

NO.	TITLE	INVESTMENT AREA	PROPOSED SOLUTION
1.	MAEE for Hull Bio-Fouling Cleaning/Removal in Dry Docks	Weapon System Sustainment (EEC-3)	To design, develop and demonstrate an improved containment enclosure system to capture the back-spray and overspray from hull cleaning operations using an aerial work platform.
2.	Surface Cleaning of Dry Dock Floors	Ship-to-Shore Interface (EEC-4)	An IDR to conduct a site survey, complete a market analysis on technologies, expedite contract actions, provide technical direction over the equipment procurements, technology integration and pre-testing of equipment.
3.	Predictive Trajectory Model for Oil Spills for Navy Harbors	Regulatory and Base Operations (EEC-5)	To implement and link two existing models, National Oceanic and Atmospheric Administration's (NOAA) General NOAA Operational Modeling Environment (GNOME) model and the Navy's Curvilinear Hydrodynamics in 3-Dimensions (CH3D) model to predict oil trajectory following oil spills in three Navy harbors.
4.	Waste to Clean Energy (WtCE) Initiation Decision Report (IDR)	Regulatory and Base Operations (EEC-5)	An IDR will address WtCE technology for Navy-wide potential implementation. The IDR will include the development of model WtCE case studies to facilitate technology implementation at different Navy regions and/or installations.
5.	Abiotic In Situ Treatment of 1,2,3-Trichloropropane (TCP) to Protect Drinking Water Resources	Regulatory and Base Operations (EEC-5)	The scope of this project includes assessment of the potential for TCP cleanup by the whole range of chemical oxidation and reduction processes.



Interim Program Reviews

During FY08, the NESDI program conducted three interim program reviews to ensure that funded projects remained focused on the Fleet-driven need and will successfully result in technology of value to the Fleet. The program sponsored IPRs on the west coast (San Diego, CA), east coast (Carderock, MD) and for the range community (Norfolk, VA) so that its primary customers could influence the ongoing execution of NESDI-sponsored projects. In attendance at the east coast IPR, held at the Naval Surface Warfare Center (NSWC) Carderock were subject matter experts from NSWCs Carderock and Philadelphia as well as NAVSEA headquarters. The 2008 range IPR was attended by representatives from the Atlantic Fleet's range community.



Integrated a Critical Mass of Projects



Project Integration

In FY08, NESDI program personnel were able to provide the Fleet with a number of new technologies, modified industrial processes or other solutions that minimize environmental impacts. Among the successfully executed projects are:

1. **Containment and Long-Term Monitoring Strategies for Contaminated Sediment Management.** Provides the Navy with a suite of integrated containment and monitoring strategies for remediating contaminated sediments and assessing the long-term effectiveness of remedial actions.
2. **No Foam™ System for Aircraft Hangar Fire Suppression System Foam Discharge Checks.** Demonstrated and validated the effectiveness of the NoFoam™ System technology in minimizing or eliminating the Aqueous Film Foaming Foam-generated wastewater from aircraft hangar fire suppression foam system annual discharge checks.
3. **Toxicity & Transport of Munitions Constituents in the Marine Environment.** Providing the Navy with the scientific information and tools needed to evaluate the environmental impacts and transport of underwater unexploded ordnance at current and past operations along shorelines, at coastal sea ranges and within rivers, harbors and estuaries.

4. **Underwater Unexploded Ordnance Risk Assessment Tool.** Conducted a baseline ecological risk assessment using an approved U.S. Environmental Protection Agency methodology to document the effect or lack of effect of underwater munitions constituents to media, organism toxicity, bioaccumulation and community structure.
5. **Recycling of Acid Waste From Pipe Flushing on Submarine and Surface Ships.** Identified technology alternatives and selected a candidate pier side integrated system for recycling and reusing acid/heavy metal wastewater generated in submarine and surface ship pipe flushing operations and submarine missile tube cleaning.
6. **Ecological Soil Screening Levels for Invertebrates and Plants Exposed to Munitions Constituents.** Developed the dataset necessary to calculate Ecological Soil Screening Levels for munitions and explosive related chemicals often needed to support range-related mitigation measures.
7. **Environmentally-Friendly Aircraft Radome Repair.** Evaluated the effectiveness of epoxy resin and corn hybrid polymer media as viable procedural alternatives for use on aircraft radome repair.
8. **Advanced Anodizing Using Process Control Technology.** Demonstrated and validated the Metalast™ anodizing technology using advanced process control for processing of Type II and III coatings within a one-tank system and further evaluated capabilities for producing Type IIB (Type I alternative) coatings using the same system and bath chemistry.
9. **Direct-Push and Point-and-Detect In Situ Sensors for Perchlorate.** Demonstrated and validated the field use of a direct push and point-and-detect sensor system for measuring perchlorate either for rapid screening and monitoring purposes or for contaminant source characterization of perchlorate in groundwater or surface waters.
10. **Pollutant Source Tracking.** Accurately quantifying Navy contaminant loads by identifying, reviewing, demonstrating and validating contaminant source tracking technologies.



Plastic Waste Shoreside Disposal and Recycling

The intent of this NESDI project is to eliminate the landfill disposal of Plastic Waste Processor (PWP) disks. This project will develop partnerships with the private sector to receive and process PWP disks into useful feedstock for manufactured products or fuel in waste-to-energy conversion systems. This project is also identifying and evaluating recycling options for processing the disks at a cost equal to or lower than current landfill disposal fees. The project team will also establish new recycling procedures for the disks. This will include partnering with industry to accept the Navy waste and arrange commercial funding to own/operate/maintain the necessary plastic waste recycling equipment.



Ecological Soil Screening Levels for Invertebrates and Plants Exposed to Munitions Constituents

This NESDI project developed the dataset necessary to calculate Ecological Soil Screening Levels (Eco-SSL) for munitions and explosive related chemicals often needed to support range-related mitigation measures. Eco-SSLs developed through this project will be used to help the Navy avoid costly and unnecessary remediation based on use of inappropriate ecological endpoints. The results of this project will allow the Navy to:

- Better assess, in an ecologically-relevant fashion, the potential for adverse effects at sites where soil contamination due to munitions or explosive constituents is of concern;
- Evaluate and prioritize ordnance contaminated sites for evaluation in environmental programs; and
- Avoid costly and unnecessary alteration of habitats based on use of inappropriate ecological endpoints.

11. **HVOF Thermal Spray as an Alternative to Chromium Electroplating on Helicopter Dynamic Components.** Demonstrated and validated the use of HVOF coatings as a replacement for hard chromium plating on helicopter dynamic components.
12. **Predictive Aquatic Fate and Transport Model in Support of TMDL and Compliance.** Integrate relevant models into a single accurate and fast predictive software tool that can be used for addressing most of the Navy's marine and estuarine fate and transport issues under the TMDL umbrella.
13. **Prohibited and Controlled Chemical List and Target Chemical List.** Provide the Navy with standard chemical inventories for both weapon system program and facility operations managers to use to improve their hazardous material management and minimization efforts.
14. **Cadmium Alternatives Navy Specific Testing.** Conduct Navy-specific tests, utilize test data to identify the most promising cadmium alternative coatings and make implementation recommendations to Navy depots, acquisition programs and Original Equipment Manufacturers (OEM).





Technology Integration— Into the Daily Operations of the Fleet

15. **Dredge Spoil Management Alternatives.** Identified the Navy sites requiring dredging, determined the potential beneficial reuse of the dredged material from these sites and evaluated the viability of using contaminated dredge spoils as a cement kiln feed stock.
16. **Plastic Waste Shoreside Disposal and Recycling.** Eliminating the landfill disposal of PWP disks and developing partnerships with the private sector to receive and process PWP disks into useful feedstock for manufactured products or fuel in waste-to-energy conversion systems.
17. **Comprehensive Environmental Compliance Approach for Cathodic Protection in Caissons and Floating Dry Docks.** Verified the status of discharge practices, monitoring data, and guidance, assessed the nature and extent of metal contamination and facilitated the implementation of cathodic protection systems that provide effective corrosion prevention while reducing environmental impacts in caisson and floating dry dock ballast discharges.
18. **Shipyards Environmental Sustainability Initiative.** Documents current challenges and defines potential environmental investment areas to maintain shipyard productivity and compliance.

The NESDI program is documenting current challenges and defining environmental investment areas to maintain shipyard productivity and compliance.

IDRs Provide Insights & Guide Decision Making

The NESDI program sponsors the development of IDRs to provide technical insights and analyses before investment decisions are made. It is often difficult to project the success of current investments without the technical evaluation and assessments contained in an IDR. Specifically, the purpose of an IDR is to develop a comprehensive strategy to guide investments in a particular discipline or issue area. IDRs typically include a discussion of the problem to be addressed, the relevant regulations, the current state of the science and associated practices, technology alternatives including existing and emerging alternatives, gaps in the knowledge base and recommendations for future actions. The following is a list of the IDRs that the NESDI program has sponsored since FY07:

1. **Dredge Spoils Management.** This IDR is identifying the Navy sites that require dredging and determining the potential beneficial reuse of dredged materials. This IDR will also evaluate the viability of using contaminated dredge spoils as a cement kiln feed stock.
2. **Anti-Fouling Oil Booms.** The purpose of this IDR was to compare and contrast industry and Navy practices of permanent oil boom use and maintenance to determine the appropriateness of Navy investments.
3. **Climate Change.** In 2008, the NESDI program sponsored a research initiative that, in addition to summarizing the climate change effects that are expected to occur in the next century, also provides an assessment of the likely impacts on naval infrastructure and operations. The overall result of this IDR will be a set of anticipated issues related to climate change that the Navy will need to address through policies, instructions, education and technology adaptation and/or development.

Technology Integration

For the NESDI program, technology integration means making sure that technologies and other products and services developed by the program are eventually incorporated into the daily operations of the Fleet. To promote this focus on technology integration, the NESDI program has developed and promulgated the following requirements as part of its technology integration philosophy. A NESDI-sponsored project is successfully integrated once the following requirements have been met:

- The technology has been validated by the user community.
- Funding has been planned for and is in place for the integration.
- The technology has been accepted by the stakeholders.
- Customer satisfaction has been assessed and documented.
- A marketing strategy is in place.
- An implementation plan and schedule are in place.
- Sufficient support infrastructure is in place.
- A training plan has been developed and Fleet personnel have been trained on the use of the new technology.
- The use of the technology has been implemented (regardless of pathway).
- An acquisition agent has been identified and funding secured.
- Commercialization is available (if no acquisition agent exists).
- A formal change has been recognized by the SYSCOMs and the Fleet.
- The former technology has been replaced or eliminated.
- Benefit metrics have been re-assessed and validated.
- The technology has been made available through the supply/procurement system.

These requirements have been posted on the program's web site and communicated with program personnel including Principal Investigators and other personnel charged with technology integration mandates.

In addition to establishing a culture that promotes technology integration and successfully integrating projects in the hands of the end users, the NESDI program has also:

- Constructed an automated tool, called the Technology Integration Planning tool, to guide project managers through the technology integration process,
- Placed emphasis on projects that are more likely to be integrated, and
- Required Principal Investigators to document their technology integration efforts in their semi-annual briefs to the NESDI program manager.

The NESDI program sponsors the development of IDRs to provide technical insights and analyses before investment decisions are made.

4. **Shipyards Environmental Quality.** This IDR documents the stormwater management challenges facing the Navy's shipyards and proposes R&D efforts that the NESDI program could sponsor to meet those challenges.
5. **PWP Recycling and Disposal.** The ultimate objective of this IDR is to eliminate the landfill disposal of PWP disks and develop partnerships with the private sector to receive and process PWP disks into useful feedstock for manufactured products or fuel in waste-to-energy conversion systems.
6. **Enhanced Mobile Industrial Surface Cleaning.** The purpose of this IDR is to identify industrial, shore side applications that need enhanced mobile surface cleaning to ensure safe mission operations, human health and safety and environmental compliance.
7. **Pier Side Underwater Ship Husbandry Waste Reduction.** This IDR will help to determine the efficacy of reducing the shore side impact of waste generated from underwater ship husbandry operations, and identify technology demonstration/validation and integration opportunities that will help sustain the long term environmental viability of these critical, pier side fleet readiness operations.
8. **Environmental Effects of Underwater Ordnance.** This IDR gathered available scientific information associated with the effects of underwater ordnance with specific emphasis on defining munitions constituents, identifying possible environmental fate, determining munitions constituents toxicity and/or bioaccumulation potential to marine organisms, delineating exposure scenarios and quantifying the underwater risk from both leave-in-place and blow-in-place management options. The secondary goal of this IDR was to identify areas that may require additional R&D.



Dredge Spoil Management Alternatives

This NESDI project identified the Navy sites requiring dredging, determined the potential beneficial reuse of the dredged material from these sites, and evaluated the viability of using contaminated dredge spoils as a cement kiln feed stock. If proven to be a viable reuse option, the cement kiln process will be transitioned to full-scale demonstration via ESTCP and/or the NAVFAC Alternative Remediation Technology Team (ARTT) workgroup.

The Range Community

In FY08, the NESDI program dedicated more time and energy to engage a number of different FWGs that represent the various environmental subject matter experts across the Navy, including the Range Sustainability Group and other working groups with related mandates. Through these interactions, the program gains insights into the operation of the Navy's ranges, their outstanding challenges, and solutions the NESDI program may provide to address those challenges. The NESDI program held its August 2008 IPR in Norfolk, VA to bring the program to its customers in the Fleet Forces Command range community.

In addition, the NESDI program continued to tap the expertise assembled in the various Media Field Teams. These subject matter experts are in touch with the challenges being faced by the various media program managers across the Navy including air, water and other media-based programs. Over the course of FY08, more and more members of the various Media Field Teams were involved in the NESDI program helping to expand the submittal of needs from across the Fleet.

More and more, these and other working groups are recognizing the NESDI program as a valuable resource for executing the R&D projects important to their communities.

***NESDI engages a number
of Functional Working
Groups to gain insights
into the operation of
the Navy's ranges.***

The Ship-to-Shore Community

Another priority focus area for the NESDI program is the ship-to-shore community, that is, the personnel who work the interface between the ships and shore facilities. In FY08, NESDI participants brought the program to the ship-to-shore community in the following ways:

- **Sponsored an Effort to Address Ship-to-Shore Challenges.** The program-funded shipyard environmental sustainability IDR summarizes current challenges and defines potential environmental investment areas to maintain shipyard productivity and compliance. NAVSEA environmental management and policy division and shipyard environmental divisions water program managers from the four naval shipyards (Norfolk, Pearl Harbor, Portsmouth and Puget Sound) provided information on needs, guidance on envisioned solutions (e.g., technologies or policy) and priority (e.g., immediate need or forward looking).
- **Collaborated with the Ballast Water Integrated Project Team.** Also in FY08, the NESDI program supported the efforts of the ballast water integrated project team.



The NESDI program is working to understand the potential impacts of global climate change on the future operations of the Navy.



Climate Change

The NESDI program also did its part in FY08 to gain an understanding of the potential impacts of global climate change on the future operations of the Navy. In particular, the program sponsored a research initiative that, in addition to summarizing the climate change effects that are expected to occur in the next century, also provides an assessment of the likely impacts on naval infrastructure and operations. Analyses focus on projected impacts in areas with a large naval presence. The overall result of the first phase of this NESDI-sponsored research will be a set of anticipated issues related to climate change that the Navy will need to address through policies, instructions, education and technology adaptation and/or development.

This research identifies gaps in our knowledge specific to the influence of climate change on Navy shore operations and physical facilities and infrastructure, and also provides descriptions and cost analyses of evolving technologies designed to reduce and eliminate greenhouse gas emissions, adapt to climate change and mitigate the effects of climate change.

In the years ahead, the NESDI program intends to sponsor the priority recommendations as a result of the preliminary research effort initiated in FY08 to ensure the Navy's compliance in this area.

Program Efficiency

As part of its ongoing quest to improve the efficiency with which the program is executed, NESDI program personnel dedicated time and energy to the following efforts:

- **Enhanced the Program Web Site.** After unveiling the program's consolidated web site in FY06, program personnel enhanced the functions required to execute the program throughout FY08. The program web site (www.nesdi.navy.mil) provides a single, centralized repository for information pertaining to the management of the program and execution of program-sponsored projects. This web site promotes more efficient management of program information and more timely communication of critical deadlines and other information to key program personnel across the Navy. The web site also allows personnel from other R&D programs to gain up-to-date insights into the NESDI program's priorities. The site's simple, user-friendly interface provides quick access to program resources and information. The following specific updates to the program web site were made in FY08:
 1. Incorporated a collaborative component to collect input from potential end users of proposed technologies. The input is leveraged to better validate technology proposals further ensuring that resources are directed wisely.
 2. Developed a management component to improve communication of program schedules and team member responsibilities. This function of the NESDI web site generates automated e-mail reminders to notify team members of impending program deadlines and required actions. Reminders are sent to all appropriate team members and provide instructional guidance on the actions required.
- **Execution of Program Schedule and Associated Submission Deadlines.** For the second year in a row, a critical amount of the NESDI program was executed electronically via the program's web site. In particular, the following tasks were managed via the enhanced program web site:
 1. The NESDI program manager developed, documented and promulgated the annual program schedule a year in advance.
 2. Fleet personnel submitted their needs on the same schedule using the same template following the same process.
 3. The TDWG evaluated and ranked Fleet needs.
 4. Personnel submitted their preliminary project proposals following the same format and schedule.
 5. The TDWG evaluated and ranked the preliminary project proposals.
 6. Personnel submitted their full project proposals.
 7. The TDWG evaluated and ranked full project proposals.



- **Compiled and Analyzed Program and Project History Data.** Over the course of the past three years, the NESDI program has assembled a substantial archive of the program's history of funded projects. The analysis of these archive data has enabled program management personnel to:
 1. Determine which organizations have submitted needs to the program so that program personnel can encourage submittals from its priority customers,
 2. Ensure that needs deemed to be high priority by the program are addressed by the program, and
 3. Validate that program investments are concentrated in the program's priority investment areas – range sustainment and ship-to-shore interface.
- **Investigate Other Options to Increase Program Efficiency.** In addition, NESDI program personnel are investigating other methods and mechanisms to increase the efficiency with which the program is executed in FY09 including electronic meeting surrogates to minimize the travel burden on program support personnel and other electronic tools (including additional enhancements to the program's web site) to enhance program efficiency.

Economic Impact Assessments

In response to requests from the program sponsor and others for more accurate and reliable information about the performance of program-sponsored projects, NESDI program personnel drafted economic assessment guidance to:

- Understand the cost effectiveness of program-sponsored projects,
- Develop and institutionalize a standard, universal process for conducting economic assessments modeled after other successful R&D programs, and



- Implement a standard approach on a project-by-project basis where feasible.

The resultant process and guidance will support the following assessments:

- A return on investment if the project pertains to the development and integration of a specific technology,
- An assessment of the cost avoidance if the project does not pertain to a technology, and
- Determination of the efficiencies gained or other benefits to the Navy if the project will result in a guidance document, users guide or other documentation.

Navy Shore Operation Challenges

FY08 marked another year in which the NESDI program continued to align itself with the challenges facing the community of people managing the Navy's shore operations. In particular, the NESDI program:

- **Sponsored an IDR to Address Shipyard Environmental Challenges.** In July 2007, the NESDI program sponsored a two-day meeting of water program managers from the Navy's shipyards as well as a representative from NAVSEA headquarters to discuss the ongoing challenges associated with their efforts to manage stormwater runoff at their various facilities. As a result of this workshop, personnel from the Naval Surface Warfare Center Carderock, MD drafted an IDR to document these stormwater management challenges and propose R&D efforts that the NESDI program could sponsor to meet those challenges.
- **Toured the Puget Sound Naval Shipyard.** The NESDI program managers and members of the program's TDWG toured the Puget Sound Naval Shipyard to become more familiar with the shipyard's water-related environmental challenges.



Recycling of Acid Waste From Pipe Flushing on Submarines and Surface Ships

This NESDI project identified technology alternatives and selected a candidate pier side integrated system for recycling and reusing acid/heavy metal wastewater generated in submarine and surface ship pipe flushing operations and submarine missile tube cleaning. The use of this new technology will reduce the costs associated with the disposal of hazardous acid waste at the Navy's shipyards. Design specifications for a pre-production system will be provided to the user at Puget Sound Naval Shipyard.

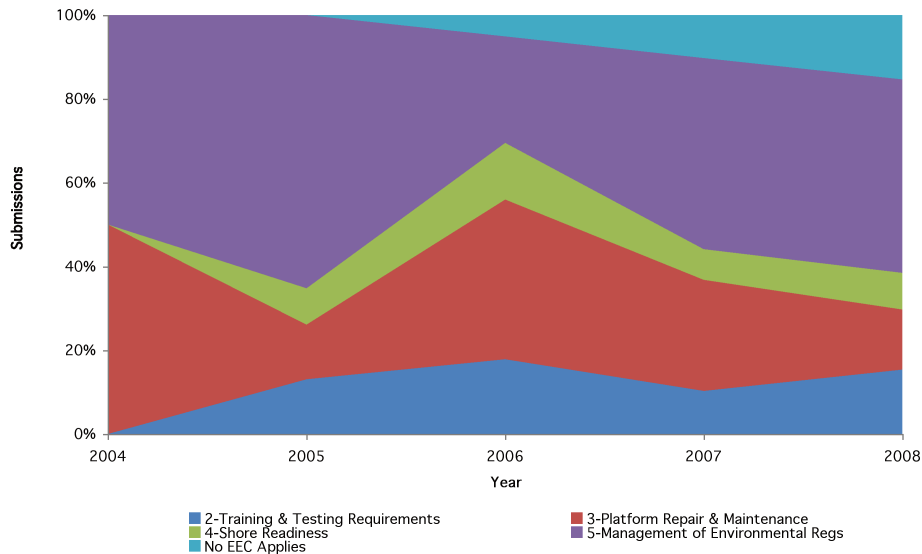
Needs Collection

In FY08, the NESDI program expanded the collection of needs and proposals to include more representation from the Fleet as well as the Navy's shipyard and range communities, resulting in the following 15 highly-ranked needs:

High Priority Fleet Needs

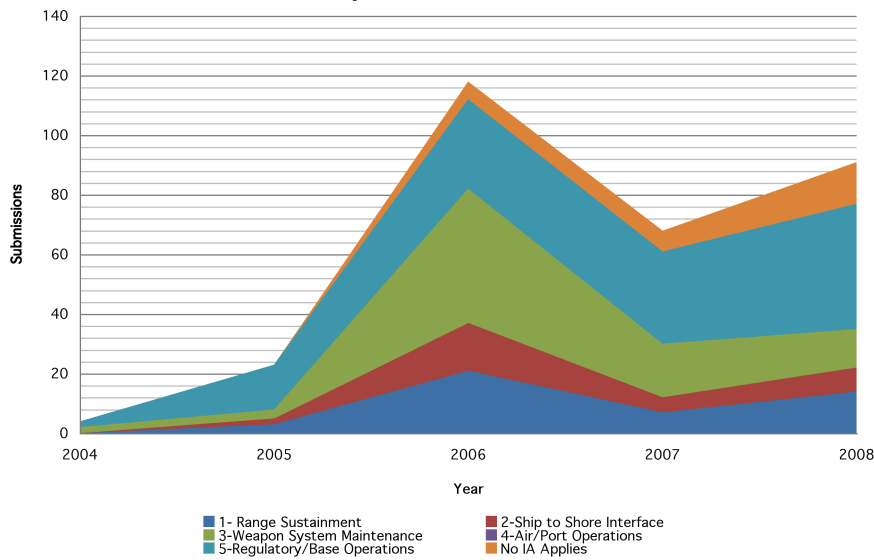
NO.	INVESTMENT AREA	REFERENCE	NEED
1.	Range Sustainment (EEC-2)	N-0575-08	Determining the Phototoxic Properties of Energetic Contaminants in Aquatic Environments
2.		N-0563-08	Optimizing Cable Routes at Navy Underwater Ranges to Minimize Installation Costs and Associated Environmental Impacts
3.		N-0560-08	Long-Term Monitoring Capabilities to Support Natural Resource Management on Navy and Marine Corps Installations and Ranges
4.	Weapon System Sustainment (EEC-3)	N-0544-08	Background Perchlorate Source Characterization at Navy Facilities and Ranges
5.		N-0590-08	Hull Bio-Fouling Cleaning/Removal
6.		N-0559-08	Evaluation of Solvent Extraction Methodologies for the Extraction of Polychlorinated Biphenyls in Shipboard Materials
7.		N-0514-08	Tools/Mitigation Measures for Coating Operations on Vessel Freeboard Areas
8.		N-0507-08	Chromate-Free Corrosion Inhibiting Conformal Coatings
9.	Ship-to-Shore Interface (EEC-4)	N-0501-08	Environmentally Friendly Alternative to FC-77 Electronic Liquid Coolant on the E-2C
10.		N-0588-08	Surface Cleaning of Dry Dock Floors
11.		N-0586-08	Reduced Generation of Shoreside Managed Waste from Pierside Supported Underwater Ship Husbandry Operations
12.		N-0572-08	Making Man-made Structures and Altered Habitats in Urban Areas of Navy Harbors More Habitable by Native Species Without Compromising Structural Integrity
13.		N-0581-08	Abiotic In Situ Treatment of 1,2,3-TCP to Protect Drinking Water Resources
14.	Regulatory and Base Operations (EEC-5)	N-0509-08	WtCE Project
15.		N-0502-08	Assessing Climate Change Related Impacts on U.S. Military Installations

Needs By EEC and Year



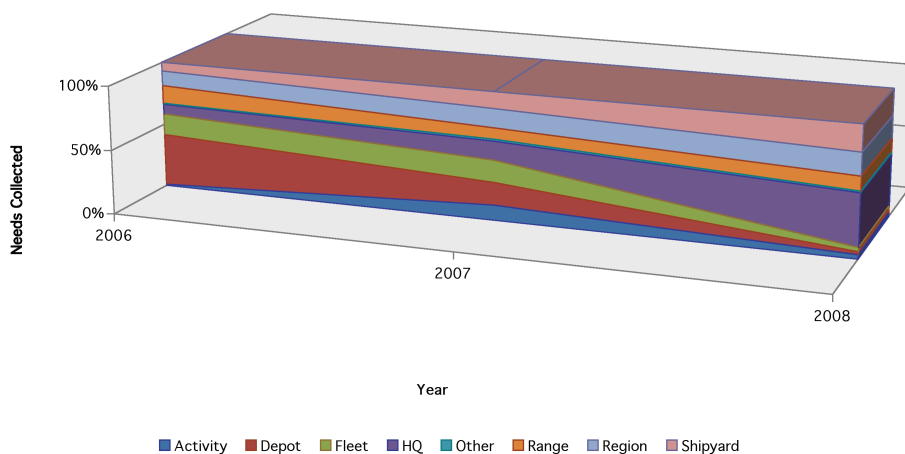
FY08 showed an increase in the needs collected in EEC-5. Almost half (46.15 percent) of the needs collected this year fell under this classification.

Needs By Investment Area & Year



In FY08, 42 needs were submitted in the Regulatory and Base Operations investment area – more than any other area.

Source of Needs Collected By Year (in percent)



The most dramatic change in the needs collected by the NESDI program from 2006 through 2008 resulted from increased participation from headquarters components and the shipyard community.

Other Technology Demonstration Programs

In FY08, the NESDI program continued to build on successful partnerships with other environmental 6.4 programs to leverage resources and expertise. Projects having joint service application initiated by the NESDI program are forwarded to the Strategic Environmental Research and Development Program (SERDP), the Environmental Security Technology Certification Program (ESTCP), and the Joint Group on Pollution Prevention (JG-PP). This ensures that each Service has identified the technical criteria for the solution and will be evaluated during the project. The result is to eliminate duplicative efforts and maximize the integration of technologies across the Services.



***Built Partnerships with
Other Technology
Demonstration Programs***

Collaborations with these other programs help to support the ongoing success of a number of the NESDI program's own projects. For example, the following NESDI projects have leveraged funds from other programs and agencies to expand the reach of their resultant technologies outside the Navy:

- HVOF Thermal Spray as an Alternative to Chromium Electroplating on Helicopter Dynamic Components, and
- No Foam System for Aircraft Hangar Fire Suppression System Foam Discharge Checks.

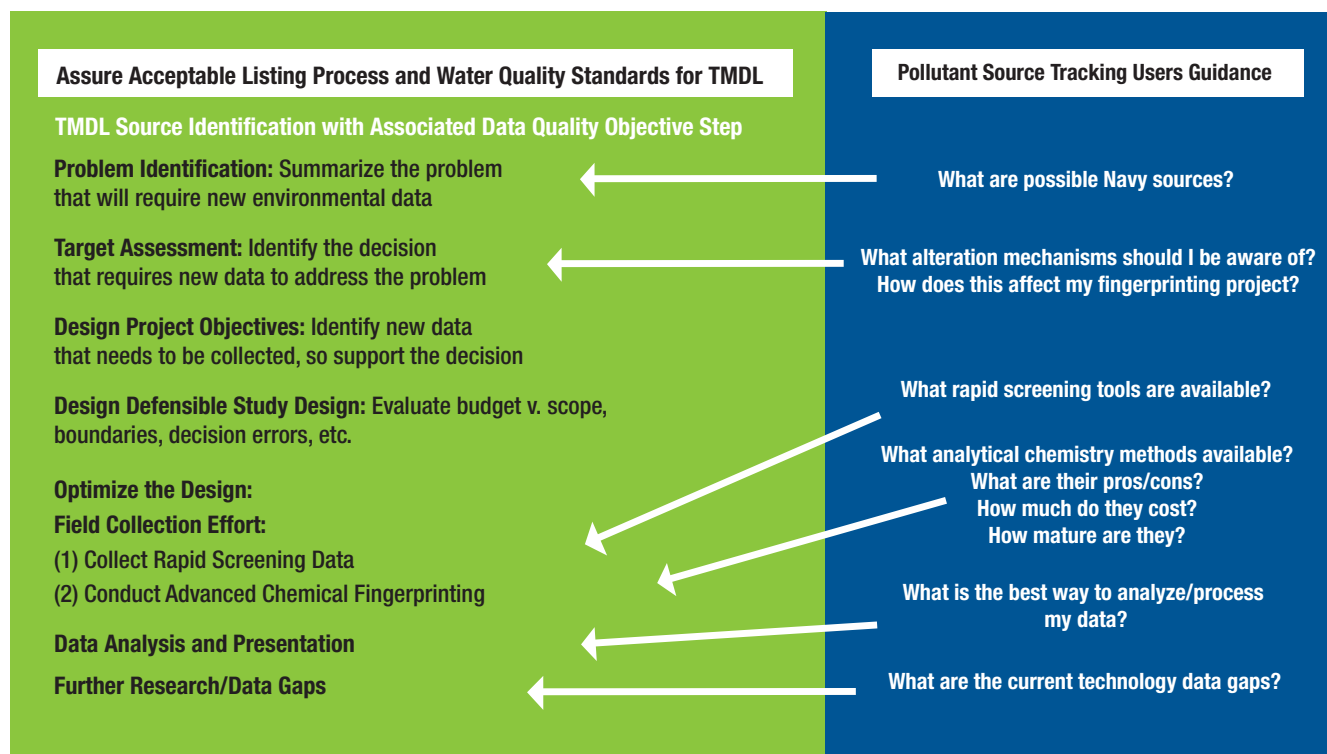
Wherever possible, the NESDI program reached into its user community and other program sponsors to leverage project resources appropriately. The results were impressive in FY08 with a total cost sharing of \$2.8 million. This is a testament to the need and urgency of the NESDI program's investments.

Pollutant Source Tracking

The objective of this project is to accurately quantify Navy contaminant loads by identifying, reviewing, demonstrating and validating contaminant source tracking technologies and developing a technical framework for Navy water program managers that enables them to:

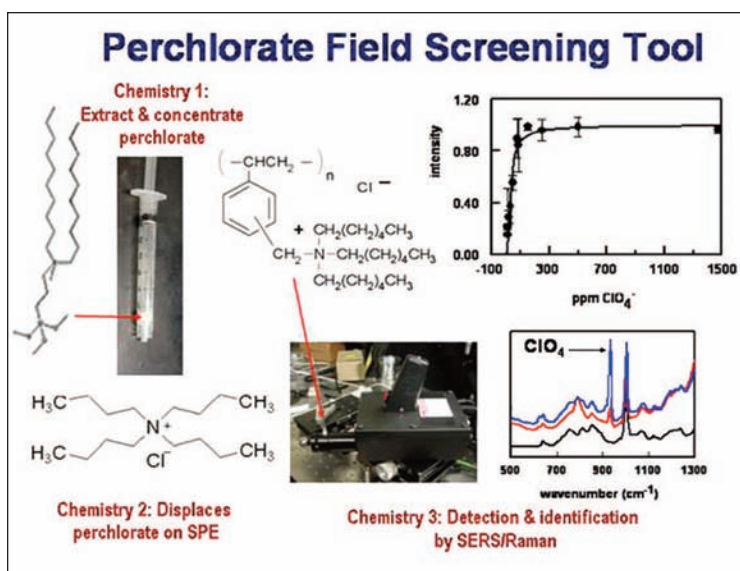
1. Attribute existing contamination loads to support compliance programs,
2. Clearly understand the suite of tracking technologies currently available, and
3. Use this scientific approach and tools to prevent arbitrary and burdensome regulatory decisions and actions that negatively impact the Navy.

A guidance document is being generated and will be available on-line. Results and methodologies will also be disseminated to Navy water program managers through training, written summaries, guidance and other web-based information.



Direct-Push and Point-and-Detect In Situ Sensors for Perchlorate

This NESDI project demonstrated and validated the field use of a direct push and point-and-detect sensor systems for measuring perchlorate either for rapid screening and monitoring purposes or for contaminant source characterization of perchlorate in groundwater or surface waters. Direct push sensor systems have been shown to save approximately 30-50 percent of the cost of site investigations for typical large sites. A direct push sensor for perchlorate will provide a cost effective means of delineating perchlorate at Navy sites. This technology will be transitioned via commercial service providers who will facilitate widespread availability of the technology and ensure that practical issues important for the commercial viability of a technology are considered.



Key Performance Metrics for the NESDI Program in FY08

1. 91 needs were collected from Fleet operational personnel and acquisition community members.
2. 15 high priority Fleet operational needs were identified.
3. 3 semi-annual program reviews were held.

A direct push sensor for perchlorate will provide a cost effective means of delineating perchlorate at Navy sites.



METRICS

The NESDI program assesses its progress using performance metrics in the following three areas:

1. Project Execution. These metrics capture the degree to which the NESDI program effectively executes individual projects.
 - a. Fleet Needs. The number of needs collected from the Fleet each year. [In FY08, 91 needs from Fleet operational personnel and acquisition community members were collected.]
 - b. Address High Priority Needs. The number of needs ranked as “high priority” by program personnel each year. [In FY08, the program identified 15 high priority Fleet operational needs. The FY09 project new starts address some of these high priority needs.]
 - c. Performance-Based Evaluation. Each project is evaluated based on cost, schedule and performance to determine how efficiently individual projects are executed. Projects are adjusted based on regular evaluations conducted by program personnel. [The NESDI program sponsored three semi-annual program reviews in FY08 to reevaluate project cost, schedule and performance objectives.]
2. Technology Integration. This metric deals with the program’s ability to effectively integrate technologies into Navy operations. Project buy-in is obtained from end users, approval authorities and procurement stakeholders prior to project funding. Integration objectives are reviewed and approved by the TDWG at the onset of each project (a “go/no-go” decision). No project is funded until objectives are approved. Integration objectives and accomplishments were reviewed semi-annually. Products integrated are evaluated again after one year to:
 - a. Ensure that goals are met,
 - b. Address unanticipated barriers, and
 - c. Update associated Return on Investment (ROI)/cost avoidance numbers.



Shipyard Environmental Sustainability Initiative

The NESDI-funded shipyard environmental sustainability IDR documents current challenges and defines potential environmental investment areas to maintain shipyard productivity and compliance. Naval Sea Systems Command environmental management and policy division and shipyard environmental divisions water program managers from the four naval shipyards (Norfolk, Pearl Harbor, Portsmouth and Puget Sound) provided information on needs, guidance on envisioned solutions (e.g., technologies or policy) and priority (e.g., immediate need or forward looking). Thirty-five original needs were narrowed to twelve high priority needs. Further details on regulatory and performance drivers along with potential integration pathways gauged NESDI specific relevance. Resulting from this IDR, fiscal year 2009 NESDI investments in drydock floors surface cleaning and hull coating application using motion assisted environmental enclosure technology aim to improve environmental compliance while increasing or maintaining current shipyard productivity.

3. Cost/Environmental/Operational Benefit. These metrics pertain to the benefit achieved by the Navy through the integration of innovative products and services and fall into three categories:
 - a. Cost avoidance,
 - b. Current and future regulatory compliance status, and
 - c. Increased Fleet readiness. In this area, the NESDI program is tracking the following indicators:
 - User ROI/cost avoidance (greater than 2.5),
 - Quantify environmental benefits,
 - Reduced emissions and/or waste generated,
 - Reduced environmental liability,
 - Informed decision-making,
 - Reduced worker exposure,
 - Reduced cost of compliance,
 - Reduced Notice of Violations,
 - Quantify operational readiness benefits,
 - Reduced operation & maintenance costs,
 - Reduced maintenance time,
 - Reduced turn around time, and
 - Program management costs (5 percent).





FINANCIAL REVIEW

The NESDI program has prioritized investments in various EECs based on their potential risk to the Navy mission. The NESDI program has aligned its investment portfolio based on priority, urgency and operational requirement. The table below highlights the approximate breakdown of program investments by EEC.

EEC	NAME	FY08	FY09	FY10 (PROJECTED)
EEC-1	Evaluate & Minimize Environmental Constraints on Platform Operation and Force Projection	0.0	0.0	0.0
EEC-2	Maximize Training & Testing Requirements Within Environmental Constraints	1.5	1.2	1.2
EEC-3	Platform Repair & Maintenance with Minimal Environmental Impact	2.4	1.2	.5
EEC-4	Support Shore Readiness Within Environmental Constraints	1.8	1.8	1.5
EEC-5	Cost-Effective Management of Environmental Regulatory Requirements	1.9	2.4	1.8

in millions of dollars

The NESDI program has prioritized investments based on potential risk to the Navy mission.

Organizations Participating in the NESDI Program

Over the years, a range of organizations from across the Navy and elsewhere have supported the NESDI program in one way or another. Personnel from the following organizations have participated in the program by:

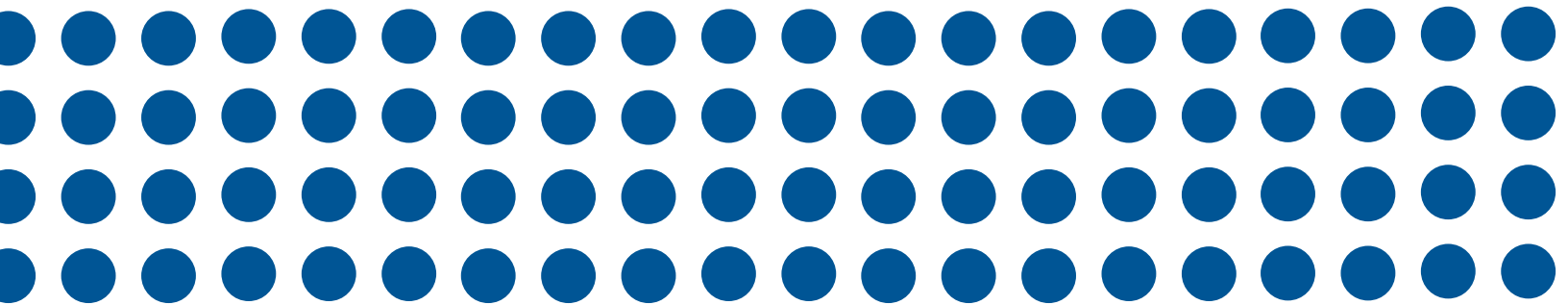
- Attending an IPR,
 - Submitting or ranking a need,
 - Submitting or ranking a pre- or full proposal, and
 - Providing ad hoc advice and guidance.
-
- | | | |
|--|---|--|
| • Applied Research Laboratory | • Naval Air Station Fallon, NV | • Naval Undersea Warfare Center Newport, RI |
| • Pennsylvania State University | • Naval Air Station Patuxent River, MD | • NAVFAC Atlantic |
| • Chief of Naval Operations Environmental Readiness Division | • Naval Air Systems Command | • NAVFAC Hawaii |
| • Commander, Navy Installations Command | • Naval Air Warfare Center – Aircraft Division Patuxent River, MD | • NAVFAC Mid-Atlantic |
| • Commander, Navy Region Mid-Atlantic | • Naval Air Warfare Center - Aircraft Division Lakehurst, NJ | • NAVFAC Northwest |
| • Commander, Navy Region Southwest | • Naval Air Warfare Center – Weapons Division China Lake, CA | • NAVFAC Southeast |
| • Commander, Pacific Fleet | • Naval Facilities Engineering Command | • NAVFAC Southwest |
| • Engineering Field Activity Northeast | • Naval Facilities Engineering Service Center | • NAVFAC Washington |
| • Engineering Field Division South | • Naval Facilities Marianas | • Navy Region Southwest |
| • Environmental Security Technology Certification Program | • Naval Sea Systems Command | • Norfolk Naval Shipyard |
| • Explosive Ordnance Disposal Mobile Unit Three | • Naval Support Activity Crane, IN | • Office of the Secretary of Defense |
| • Fleet Assistance Support and Technology Transfer Team | • Naval Support Activity Panama City, FL | • Pearl Harbor Naval Shipyard |
| • Fleet Forces Command | • Naval Surface Warfare Center Carderock, MD | • Portsmouth Naval Shipyard |
| • Fleet Readiness Center East | • Naval Surface Warfare Center Dahlgren, VA | • Public Works Department Kingsville, TX |
| • Fleet Readiness Center Southeast | • Naval Surface Warfare Center Philadelphia, PA | • Puget Sound Naval Shipyard and Intermediate Maintenance Facility |
| • Fleet Readiness Center Southwest | • Naval Surface Warfare Center Washington, DC | • Southeast Regional Maintenance Center |
| | | • Space and Naval Warfare Systems Command |
| | | • SPAWAR Systems Center Pacific |
| | | • Strategic Environmental Research and Development Program |



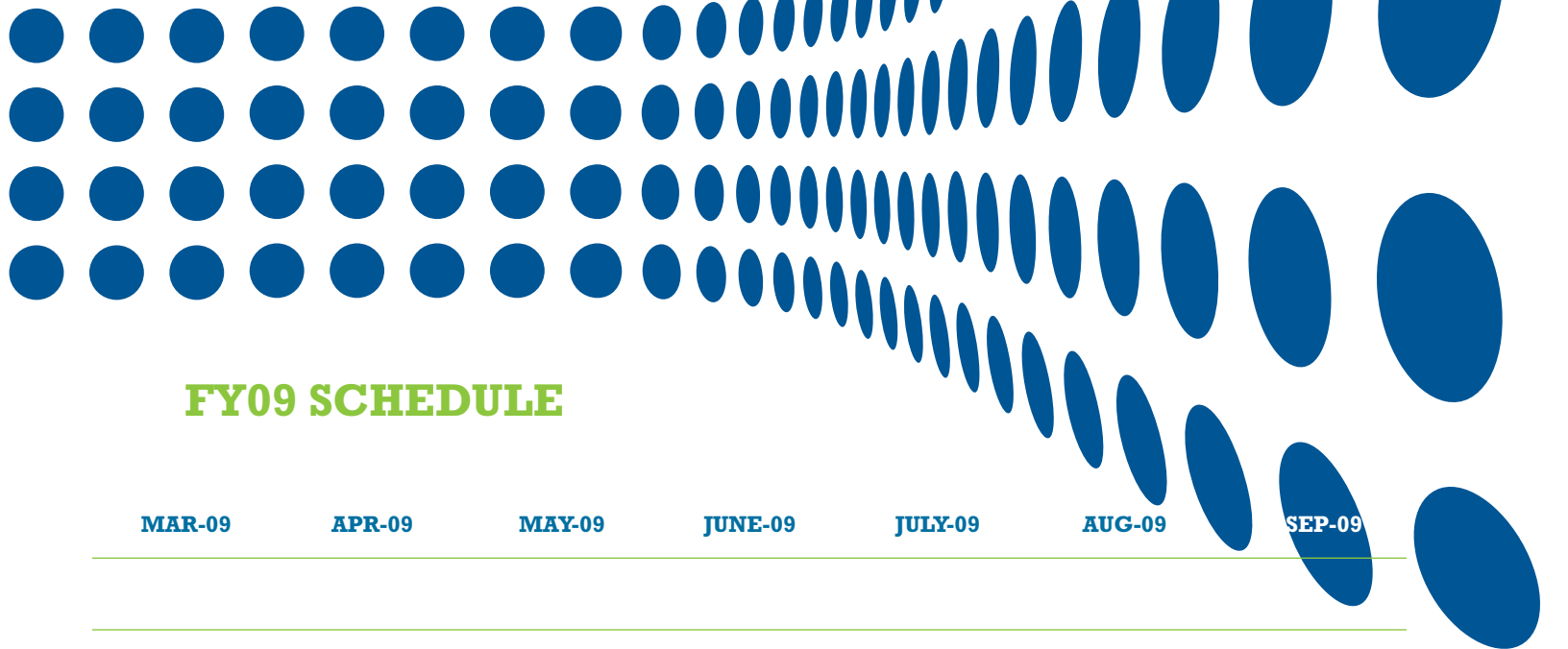
THE ROAD AHEAD: PLANS FOR FY09 & BEYOND

In FY09, the NESDI program will concentrate its resources and personnel in the following areas:

1. *Expand Outreach Efforts to the Fleet.* In FY09, the NESDI program will redouble its outreach efforts to the Fleet to:
 - a. Coordinate the collection of requirements, especially those that pertain to the ongoing successful management of the Navy's operational and training ranges,
 - b. Support the integration of the program's innovative technologies into the hands of Fleet artisans, and
 - c. Incorporate perspectives from Fleet users into the planning and execution of individual NESDI projects to ensure a more complete integration of those projects.Many of these objectives will be accomplished by adding a Fleet representative to the program's TDWG.
2. *Assess Future Environmental Risks to the Navy's Operational and Training Capability.* In FY09, the NESDI program will dedicate significant resources to identify and assessing the potential impacts of future environmental requirements on the Navy's operational and training ranges.
3. *Concentrate on Project Completion and Integration.* In FY09, the NESDI program will:
 - a. Incorporate a more regimented process to ensure that projects are completed in a timely fashion and within designated budgets,
 - b. Conduct the financial analyses necessary to obtain a better sense of the return that the program is achieving on its investments,
 - c. Better understand the potential and realized benefits of program-sponsored projects,
 - d. Dedicate the resources required to ensure that projects are successfully integrated, and
 - e. Enhance the program's various planning, execution and reporting functions to guarantee a better return on program investments.



WHAT	OCT-08	NOV-08	DEC-08	JAN-09	FEB-09
Announce Needs Solicitation	15 Oct				
Review New Starts & Go/No Go Decisions				16 Jan	
Complete Needs Collection Process				20 Jan	
Evaluate Needs					17-20 Feb
Request Pre-proposals					
Close Pre-proposal Collection					
Collect Comments on Pre-proposals					
Evaluate Pre-proposals					
Request Full Proposals					
Collect Full Proposals					
Comment on Full Proposals					
Evaluate Full Proposals					
Announce New Starts					
Semi-Annual Status Reports					
Interim Program Reviews	14 Oct	REVIEW: 4 Nov			



FY09 SCHEDULE

MAR-09	APR-09	MAY-09	JUNE-09	JULY-09	AUG-09	SEP-09
2 Mar						
13 Apr						
11 May						
18-22 May						
26 May						
13 July						
3 Aug						
10-14 Aug						
16 Sept						
13 Apr	REVIEW at IPR		REVIEW at IPR			
	West: 18-22 May		East: 27-31 July		Range: 12 Aug	

