AMERICA'S FLEET STARTS HERE

NAVSEA
WARFARE CENTERS
Carderock

SCAN TO LEARN MORE

NAVAL SURFACE WARFARE CENTER

CARDEROCK DIVISION

TABLE OF CONTENTS

ABOUT

NSWC CARDEROCK DIVISION

Naval Surface Warfare Center (NSWC) Carderock Division is the Navy's center of excellence for ships and ship systems. For more than 100 years, NSWC Carderock Division has helped preserve and enhance the nation's presence on and under the seas. NSWC Carderock Division is the full-spectrum research and development, test and evaluation, engineering, and fleet support organization for the Navy's ships, submarines, military watercraft, and unmanned vehicles with insight into new concepts and diverse technologies for the nations' modern fleet. The Division's expertise includes naval architecture and engineering, electrical and mechanical engineering, computer engineering, Naval materials, structures, and physics, as well as several other maritime concentrations.

NSWC Carderock Division's unique laboratories, modeling and simulation facilities, at-sea-assets, and large-scale, land-based engineering and test sites at our headquarters in West Bethesda, Maryland, and seven detachment locations across the country contribute to the full-spectrum nature of our mission, allowing Carderock Division to continue to prioritize solving key operational problems to meet future fleet needs.

Navy and maritime communities have come to depend on our expertise and innovative spirit in developing advanced platforms and systems, enhancing naval performance, integrating new technologies, and reducing operating costs. For more than a century, NSWC Carderock Division has been at the forefront of technologies vital to the success of the U.S. Navy and Maritime Industry, and will continue to enable and empower tomorrow's fleet.

Mission

Carderock's mission is to conduct world-class ship design and engineering that protects our Sailors and Marines and allows them to deliver combat power at sea.

Vision

Our vision is to be the Navy's trusted partner for identifying and providing world-class, cost-effective and innovative technical solutions for advanced ships and ship systems, enabling the warfighter to execute their missions and maintain their technological edge.

Core Equities

Full-spectrum, life-cycle naval architecture and marine engineering for ship, submarines, boats, craft and unmanned vehicles.

- Ship Design and Integration
- Hull Forms and Propulsion Systems
- Structures and Material Systems
- Environmental Quality Systems
- Vulnerability and Survivability Systems
- Signatures and Silencing Systems

CARDEROCK
AT A GLANCE

Southeast Alaska Acoustic Measurement Facility
Ketchikan, AK

Acoustic Research Detachment
Bayview, ID

Carderock Division Headquarters
West Bethesda, MD

Puget Sound Detachment at Naval Submarine Base Bangor
Bangor, WA

Norfolk Detachment Combatant Craft Division
Norfolk, VA

Acoustic Trials Detachment
Titusville, FL

Memphis Detachment Dr. William B. Morgan Large Cavitation Channel
Memphis, TN

South Florida Ocean Measurement Facility
Dania Beach, FL

7 DETACHMENTS

WORKFORCE

3,004	Civil Service
1,867	Scientists & Engineers
177	Reservists
1	Military
548	Veterans

54% Scientists & Engineers with Advanced Degrees

34% Civilians with Advanced Degrees

TOP SPONSORS

- PEO Attack Submarines
- Office of Naval Research
- PEO Ships
- PEO Strategic Submarines
- PEO Unmanned & Small Combatants

TOP ENGINEERING FIELDS

- Mechanical Engineer
- Naval Architect
- Chemical, Computer, & Environmental Engineer
- Materials Engineer
- Electrical Engineer

DEPARTMENTS

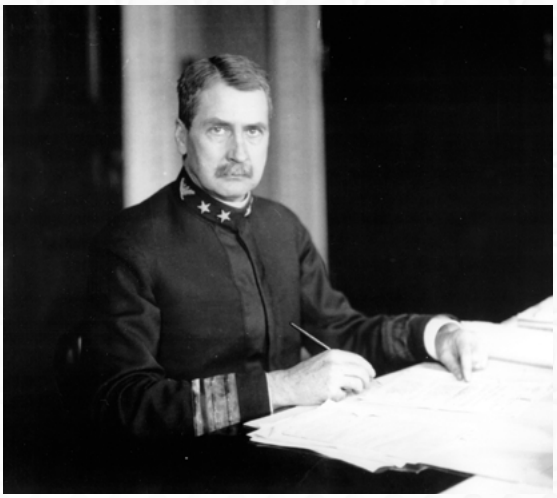
3 TECHNICAL **3 BUSINESS**

AVERAGE AGE 42

12 AVERAGE YEARS OF SERVICE

HONORING
A LEGACY

Rear Adm. David Watson Taylor, USN (March 4, 1864 - July 28, 1940) was a naval architect and engineer of the United States Navy. He served during World War I as Chief Constructor of the Navy, and Chief of the Bureau of Construction and Repair. Taylor is best known as the man who constructed the first experimental towing tank ever built in the United States.



The origin of NSWC Carderock dates back to the establishment of the U.S. Navy's Experimental Model Basin in 1898 by Rear Adm. David Watson Taylor. A naval architect and engineer of the U.S. Navy, Taylor formulated some of the basic principles of ship design.

Taylor was instrumental in convincing Congress of the value of tow tanks and model tests in support of our nation's defense mission. To pursue this, he designed and supervised construction of the Washington Navy Yard's Experimental Model Basin (EMB).

Taking charge of the EMB in 1899, Taylor undertook experiments to discover what characteristics of a ship's hull govern its resistance to being propelled through the water. By a method internationally known since 1910 as the Taylor Standard Series Method, he determined the actual effect of changing those characteristics, making it possible to estimate in advance the resistance of a ship of given proportions. His Speed and Power of Ships (1910), setting forth this knowledge, is still informative. For 15 years he remained in charge of EMB, during which time more than 1,000 ship designs for all Navy and many civilian vessels were tested.

In 1914, Taylor became Chief of the Bureau of Construction and Repair. Through World War I, Taylor supervised the creation of numbers of new ships for naval service. For this work the Navy bestowed upon him the Distinguished Service Medal, with the citation: "For exceptionally meritorious service in a duty of great responsibility as Chief of the Bureau of Construction and Repair."

The Navy broke ground on Sept. 8, 1937, for a new model basin, named in his honor, the David Taylor Model Basin, at Carderock in West Bethesda, Maryland. On Nov. 4, 1939, the Navy held the dedication ceremony with Taylor, by then confined to a wheelchair, in the company of his wife, daughter, and many friends and colleagues. This brilliant officer died in July 1940, having lived to see his vision become a reality. Research commenced several months after the dedication. By then, personnel had moved from the Washington Navy Yard to the new facility and sufficient equipment had been installed. Today's towing basin still retains his name at NSWC Carderock as a living memorial to this distinguished naval architect and marine engineer.

Throughout the following century, NSWC Carderock has earned a distinguished reputation as the birthplace of superior naval technology, addressing the full spectrum of applied maritime science and technology, from the theoretical and conceptual beginnings, through design and acquisition, to implementation and follow-on engineering.

TIMELINE
OF NOTABLE EVENTS

1896

Experimental Model Basin established at the Washington Navy Yard

1937

Carderock Site Approved (David W. Taylor Naval Ship Research and Development Center)

1967

First large-scale model submarine test vehicle delivered to Acoustic Research Detachment (ARD) Lake Pend Orielle, Idaho

1967

Combatant Craft Detachment established (Little Creek, Virginia)

2008

Twisted Bicone Arrays installed at STAFAC, SEAFAC

2013

Modeling and Seakeeping (MASK) basin renovated (West Bethesda, Maryland)

ABOUT NAVSEA

NSWC Carderock Division is one of 10 Warfare Center Divisions of the Naval Sea Systems Command (NAVSEA), which designs, builds, delivers and maintains ships, submarines and systems reliably, on-time and on-cost for the United States Navy. NAVSEA is comprised of command staff, headquarters directorates, affiliated Program Executive Offices (PEOs) and numerous field activities. Together, we engineer, build, buy and maintain ships, submarines and combat systems that meet the fleet's current and future operational requirements.

Roles of the Warfare Centers

- Make naval technical programs successful
- Provide a bridge between the technical community and the warfighter
- Determine and develop capabilities for the fleet
- Verify the quality, safety, and effectiveness of platforms and systems
- Design, develop, and field solutions for urgent operational fleet need

PROGRAMS

7,322 Ship/Submarine, Modernizations/Tech Insertions

145 Technical Capabilities

164+ Unique RDT&E facilities

18,672 Depot Refurbs/ IMA repairs

141,525 Technical/Logistic Hotline Call Responses

1,657 Fleet Fly-Away Teams Dispatched

443 Customers

$8.2B Contracted Annually

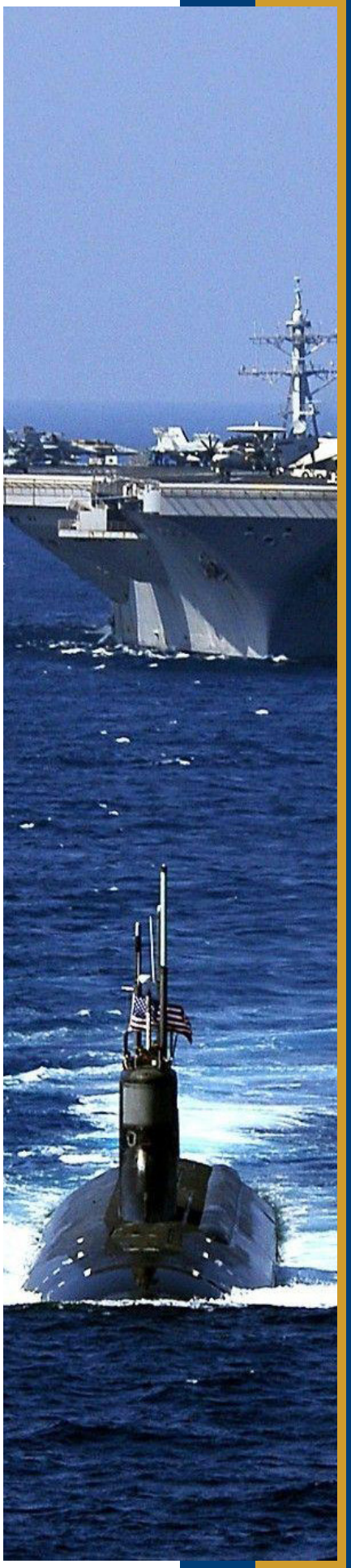
PERSONNEL

909 PhDs

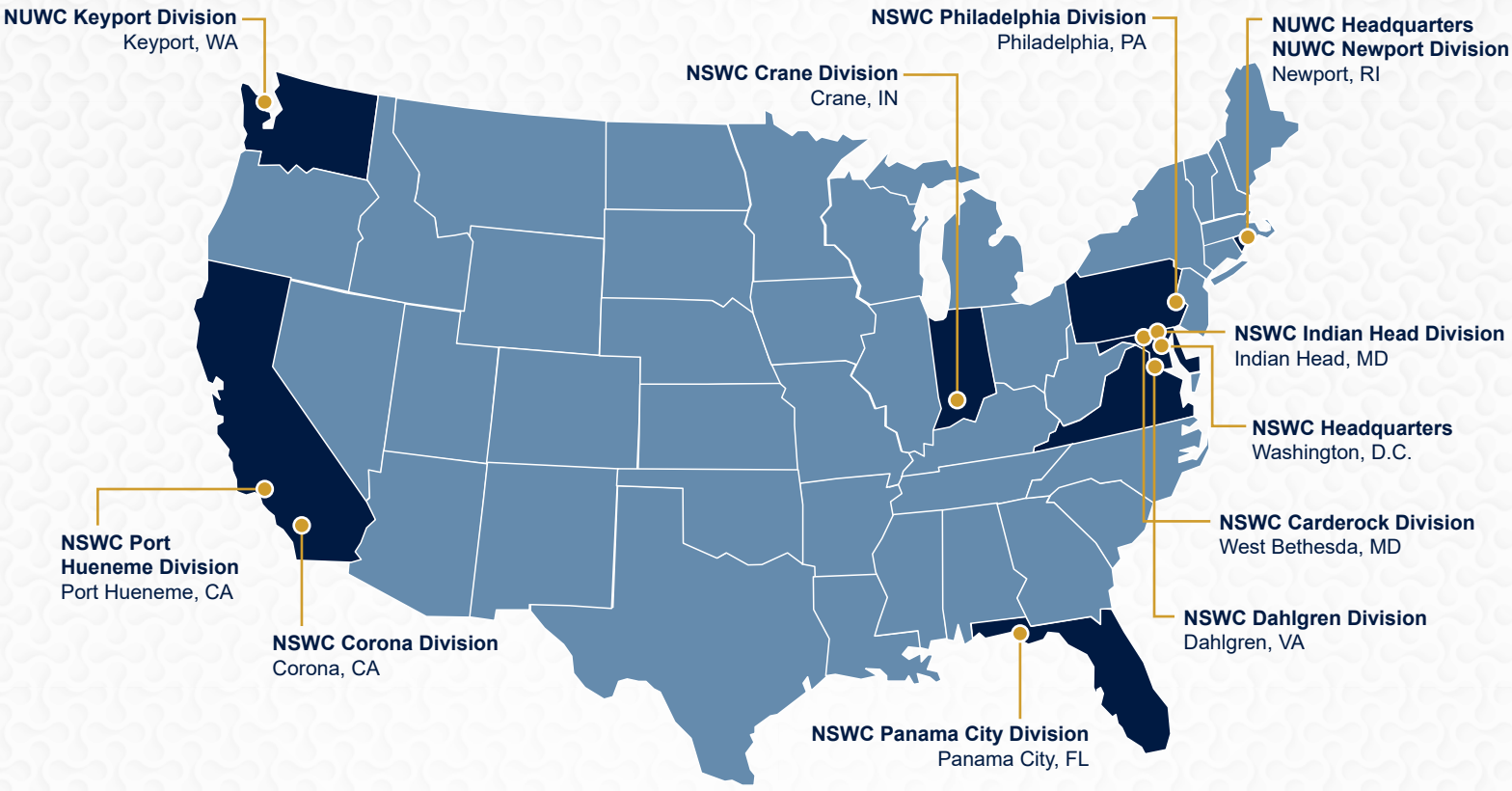
144 Patents Filed

6,820 Masters Degrees

15,721 Scientists & Engineers



NAVSEA
WARFARE CENTERS



10 Divisions - One Team

Delivering Readiness, Capability, and Capacity

Naval Surface Warfare Centers

- NSWC Carderock Division
- NSWC Corona Division
- NSWC Crane Division
- NSWC Dahlgren Division
- NSWC Indian Head Division
- NSWC Panama City Division
- NSWC Philadelphia Division
- NSWC Port Hueneme Division

Naval Undersea Warfare Centers

- NUWC Keyport Division
- NUWC Newport Division

CAPABILITIES

"CRADLE TO GRAVE" SUPPORT

Carderock Division's unique laboratories, modeling and simulation facilities, at-sea-assets and large-scale, land-based engineering and test sites at nine locations across the country contribute to the full-spectrum nature of our mission.

The Carderock Division has a very comprehensive set of technical capabilities to support its mission. These capabilities cover all aspects of surface ship and submarine mechanical, material, structural, signatures and vulnerability systems across the full life cycle. In essence, the Division supports ships from keel to masthead and from cradle to grave.

Ship Integration and Design

Specialized expertise for surface and undersea vehicle design including early concept development, assessment and selection of emerging technologies; integration of selected technologies into optimized total vehicle designs; and evaluation of those technologies and designs for cost, producibility, supportability and military effectiveness.

Environmental Quality Systems

Facilities and expertise for research, development, design, human system integration, acquisition support, in-service engineering, fleet support, integrated logistic concepts and life-cycle management resulting in mission compatible, efficient and cost-effective environmental materials, processes and systems for fleet and shore activities.

Naval Architecture, Including Hull Forms and Propulsors

Full-spectrum hydrodynamic capabilities (facilities and expertise) for research, development, design, analysis, testing, evaluation, acquisition support and in-service engineering in the area of hull forms and propulsors for the U.S. Navy.

Signature and Silencing Systems

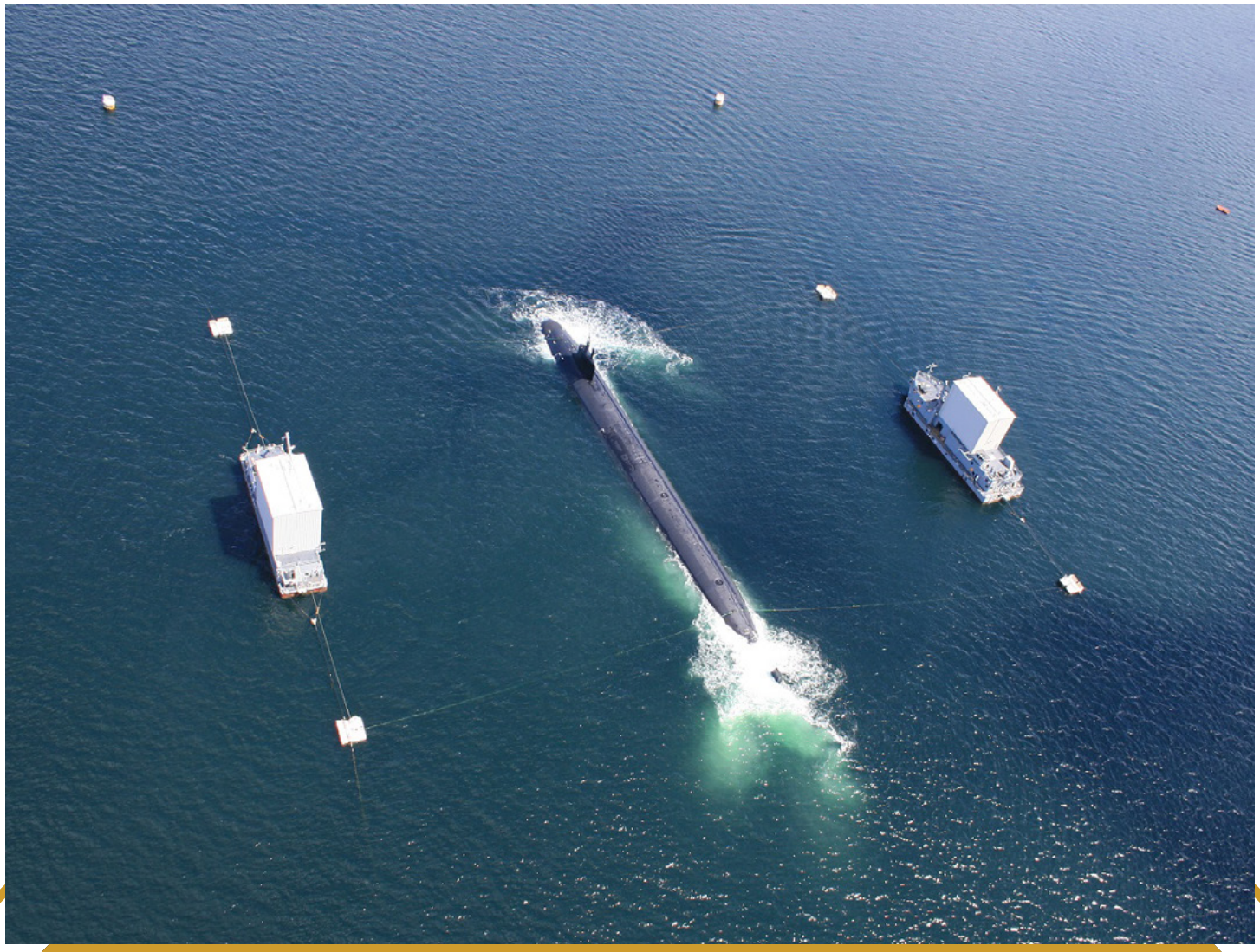
Research, development, design, testing, acquisition support, fleet guidance and training and in-service engineering for signatures on ships and ship systems for all current and future Navy ships and seaborne vehicles and their component systems and assigned personnel.

Structures and Materials

Specialized facilities and expertise for the full-spectrum of research, development, design, testing, acquisition support and in-service engineering in the area of materials and structures.

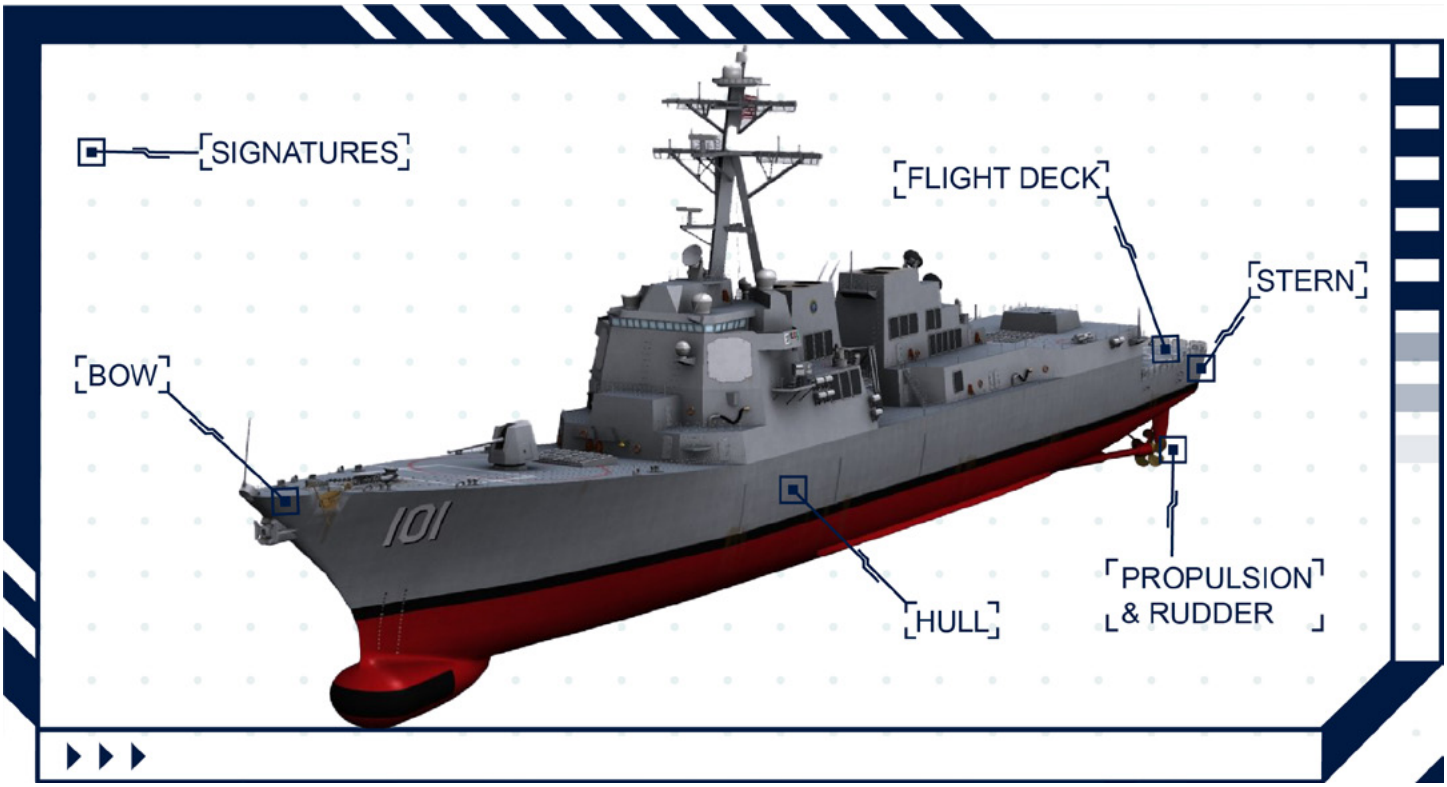
Vulnerability and Survivability Systems

Full-spectrum capabilities (facilities and expertise) for research, development, design, testing, acquisition support and in-service engineering to reduce vulnerability and improve survivability of naval platforms and personnel.

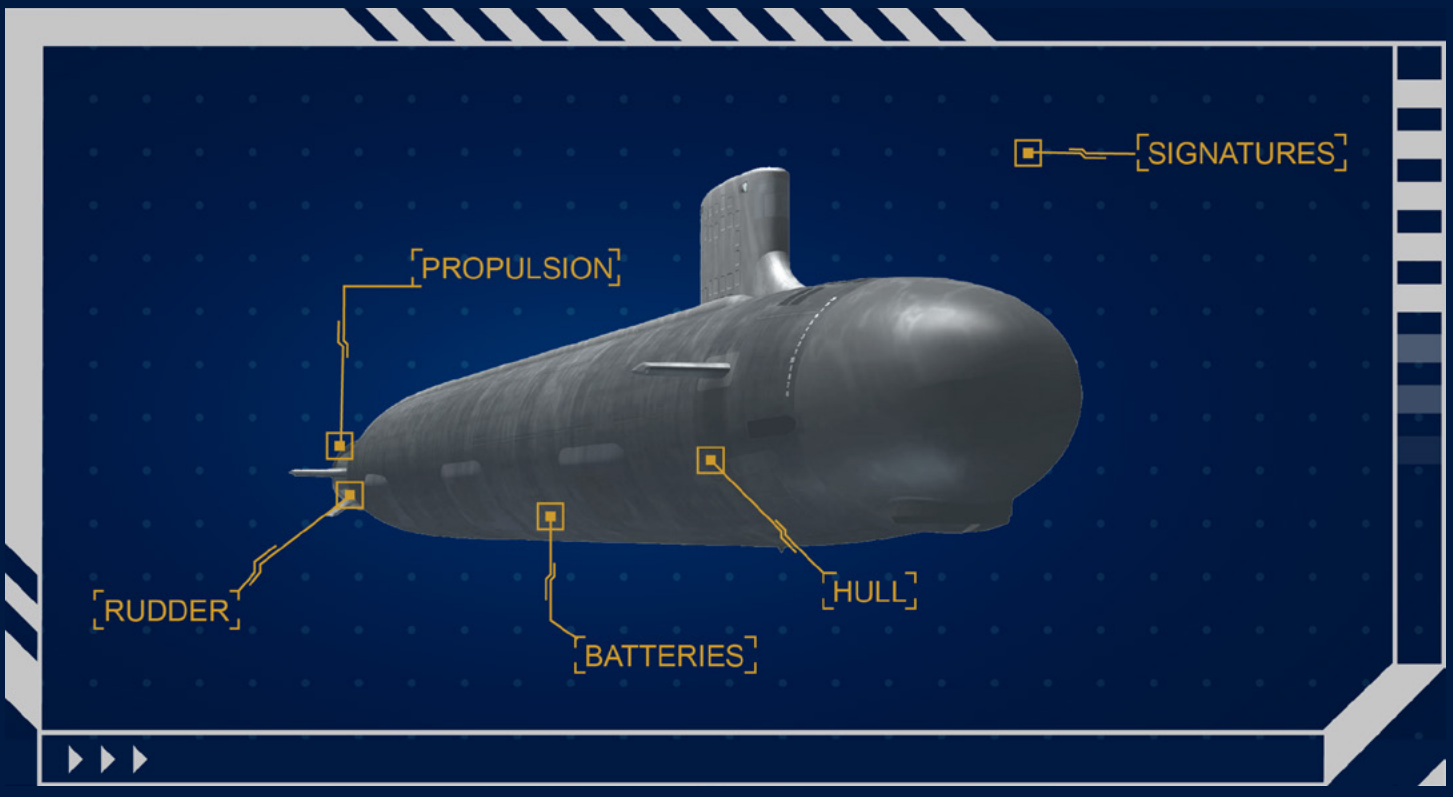


CONTRIBUTIONS

TO SURFACE SHIPS



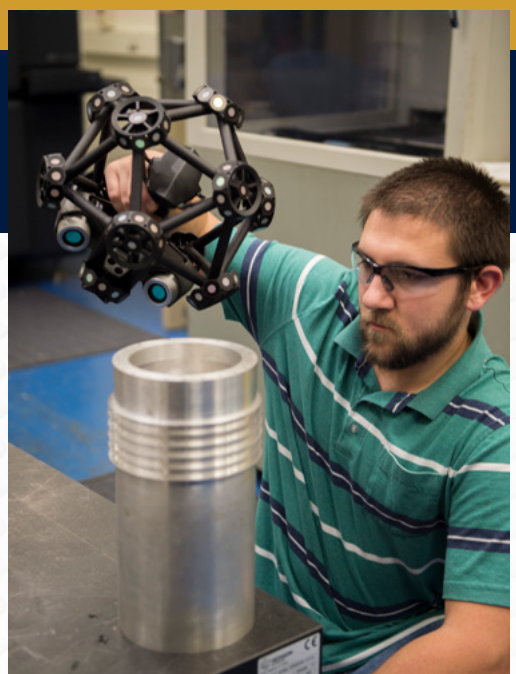
TO SUBMARINES

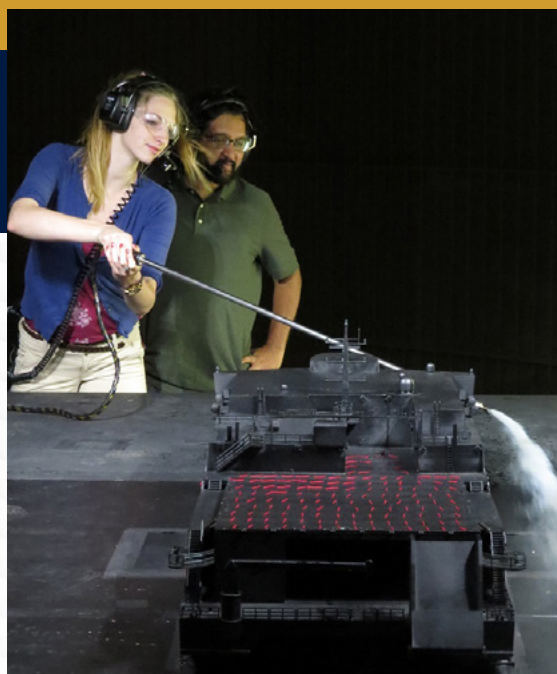


FACILITIES & LABS

The mission and workload of the Carderock Division requires extensive facilities. Work is performed across the life-cycle of naval vehicles and includes the full breadth of technologies associated with surface ships; submarines; boats and craft; unmanned vehicles, ranging from small models in laboratories to large models; and operational ships in the ocean environment. Many of the facilities needed to support the Division's mission are unique in the Navy, in the nation or in the world.

While analytical models and analysis techniques have been developed and are being continually refined, facilities are still needed to validate the models/techniques and to ensure that new ships meet performance specifications on delivery and operational units continue to perform as designed before going into the operational environment. Consequently, the Carderock Division is one of the Navy's most facility-intensive research and engineering activities.



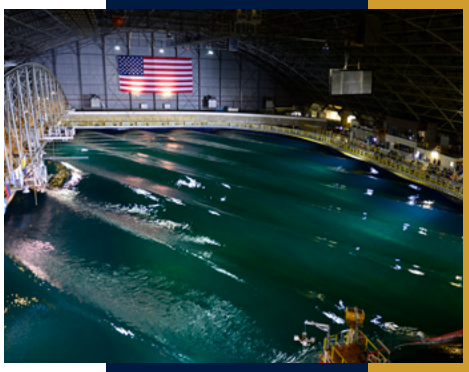


David Taylor Model Basin

The David Taylor Model Basin building is 3,200 feet long and houses the shallow-water basin, the deep-water basin and high-speed basin. Engineers use this basin to determine the seakeeping qualities and propulsion characteristics of models in either uniform or irregular waves using towing carriages. These carriages run along rails, which follow the curvature of the earth's surface, and are equipped with model power supplies, force measuring dynamometry, mini-computer data acquisition systems and photographic lights.

Maneuvering and Seakeeping Facility (MASK)

The MASK has a wave making capability which can simulate the ocean up to sea state nine, and is used to predict the full-scale performance of ships, platforms and mooring systems in realistic waves. It is 240-feet wide, 360-feet long, holds more than twelve-million gallons of water and has a depth ranging from 20-35 feet. Engineers evaluate the maneuverability, stability and control of surface ships and submarines in waves and smooth water using model-size ship designs.

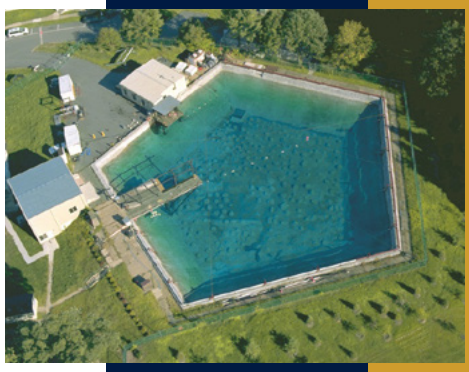


Rotating Arm Facility

The Rotating Arm Facility is a 260-foot diameter circular basin with a rotating arm, which pivots about a center post and tows models in circular paths. This facility is used primarily for propulsion evaluations in turns and captive model stability and control experiments. It's designed to measure hydrodynamic forces and moments during steady turns. Tests are conducted on both submarine and surface ship models.

Explosive Test Pond

The Explosive Test Pond was designed for use in conducting underwater explosive (UNDEX) shock testing of ship and submarine models and components. It is the only explosive-rated pond in the U.S. with the capability of providing high-speed underwater photography of UNDEX model response. The pond contains more than 3,000,000 gallons of water.



Structure Evaluation Laboratory

The Structure Evaluation Laboratory provides the facilities and expertise needed for testing large heavy structures like full-size ship components and sections. It is capable of developing loads necessary to test a 1/3-scale model of a destroyer to failure. Loads are applied to the test structure through hydraulic rams. Computer-controlled instrumentation is available to monitor loads and the response of test articles. Also part of this facility are various universal static load machines which cycle models at loads up to one million pounds of either constant or programmed amplitude loading.

Deep Submergence Pressure Tanks

The Deep Submergence Pressure Tank is a facility used to test the structural integrity of hulls and their ability to withstand the environment they operate in. This tank is 13-feet in diameter and 40-feet deep, with the ability to pressurize and simulate depths of the ocean. Scale models of submarines or submersible hulls are placed inside under pressure, in order to predict of how full-size submarines will react and handle the loads at different operating depths.

Model Fabrication Facility

The Model Fabrication Facility is used for ship and submarine model design and fabrication using Computer aided Numerically Controlled (CNC) machines, CNC programming, stereolithography manufacturing, wood and composite model fabrication, mission test support, and specialized manufacturing services.

Magnetic Field Lab

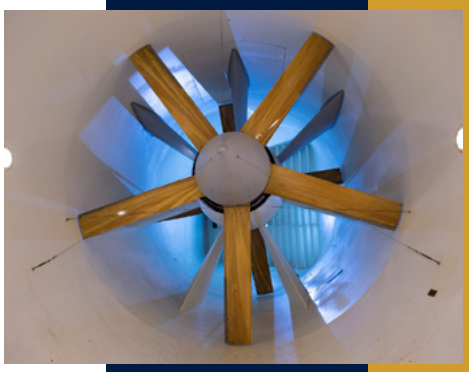
Carderock's Magnetic Field Lab was built almost entirely of nonmagnetic material, including its infrastructure and the features inside. A unique feature of this lab is its two sets of tri-axial magnetic field control coils, which enables scientists to replicate any magnetic field around the world and conduct precise magnetic measurements to see how U.S. Navy ships and submarines are going to perform. The base's magnetic facilities not only offer a unique advantage to a forward deployed Navy, but it also reduces risk to critical naval operations.

36" Water Tunnel

The 36" Water Tunnel is one of four variable pressure cavitation tunnels within the Division, necessary for testing and evaluating important technology in a controlled, but realistic environment. This facility is used primarily to determine the performance and cavitation inception characteristics of propellers and ship appendages.

Subsonic Wind Tunnel

The 8 x 10 ft Subsonic Wind Tunnel is a multipurpose test facility designed for a wide variety of fluid dynamic investigations. It is a continuous flow, closed circuit design with a closed jet test section. The wind tunnel has a speed range of 10 to 275 foot/sec in its 8 x 10-foot by 14-foot long test section. A six degree of freedom external balance allows independent measurement of forces and moments along each axis, and internal strain gauges and balances are the heard of the facility and one of its characteristics making the tunnel so unique.



Carderock Division Headquarters
West Bethesda, Maryland

NSWC Carderock Division's unique laboratories, modeling and simulation facilities, at-sea-assets, and large-scale, land-based engineering and test sites at our headquarters in West Bethesda, Maryland, and seven detachment locations across the country contribute to the full-spectrum nature of our mission, allowing Carderock Division to continue to prioritize solving key operational problems to meet future fleet needs.

Acoustic Research Detachment (ARD)
Bayview, Idaho

The mission of the Acoustic Research Detachment is to provide a signature advantage of U.S. Navy submarines, surface ships, and underwater vehicles through the use of unique, cost-effective acoustic test facilities.

VALUE ADDED TO THE U.S. NAVY

- Extremely Quiet Acoustic Test Facility
- World Class Acoustic Measurement Capabilities
- Large Scale Submarine Test Models
- Established Expertise in Support of Acoustic Testing
- Long History of Acoustic Signature Reduction

Acoustic Trials Detachment (ATD)
Titusville, Florida

The mission of the Acoustic Trials Detachment (ATD) is to provide a signatures advantage for U.S. Navy Submarines and Surface Ships through the use of unique, High Gain Measurement Systems located at the South Tongue of the Ocean Acoustic Measurement Facility (STAFAC); located at Andros Island, The Bahamas.

VALUE ADDED TO THE U.S. NAVY

- South Tongue of the Ocean Acoustic Measurement Facility (STAFAC)
- Depot Level Maintenance Facility -Titusville, FL
- World Class Acoustic Signature Measurement Capabilities
- Expertise in Support of Acoustic Testing

Detachment Puget Sound – Located at Naval Base Kitsap
Bangor, Washington

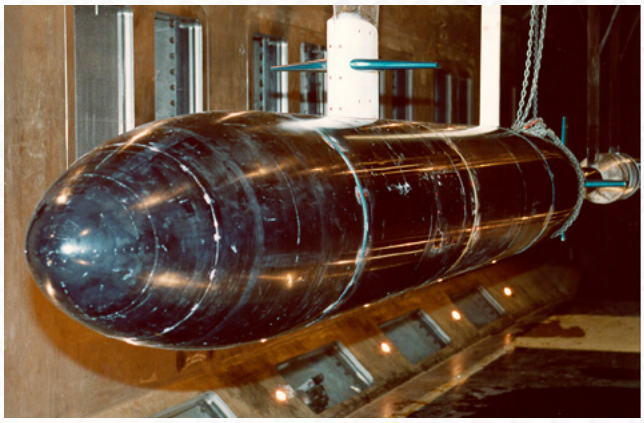
The mission of the Puget Sound Detachment is to provide signatures research, measurement system development, test and evaluation, data analysis & acquisition support, in-service engineering, and logistics & integration support of surface/undersea vehicles and associated systems.

VALUE ADDED TO THE U.S. NAVY

- Full-Scale Submarine and Surface Ship Testing & Measurement System Development
- Full-Scale Component Testing in an Ocean Environment
- Direct Support to the Submarine Force
- Continuing the Tradition of the Original Full-Scale Submarine Acoustic Measurement Facility

Memphis Detachment Dr. William B. Morgan Large Cavitation Channel
Memphis, Tennessee

The Large Cavitation Channel (LCC) is one of the world's largest and most technically advanced high-speed, variable-pressure water tunnel facilities. It is a world-class testing capability essential to the U.S Navy, which serves as a facility for testing and characterization of propulsor hydrodynamics and signatures at a scale unachievable elsewhere in the U.S.



VALUE ADDED TO THE U.S. NAVY

- Tests large scale models of advanced ship and submarine system designs, full-scale torpedoes and other Navy assets
- Capable of testing all types of ship and submarine propellers and propeller-hull interactions with model scales sufficiently large enough to match the largest towing and turning basins in the world.
- Sophisticated design permits the U.S. Navy to measure submarine and surface ship power, efficiency and propeller noise by using models in a controlled, but realistic environment.

Norfolk Detachment Combatant Craft Division (CCD)
Norfolk, Virginia

CCD's mission and responsibility to the U.S. Navy is to provide full-spectrum and full-life cycle total systems engineering for boats and combatant craft and associated systems.

VALUE ADDED TO THE U.S. NAVY

- New technologies and capabilities insertion
- Fielded watercraft meeting warfighter requirements through expert design and system engineering
- Delivery of actionable information through unbiased, data-driven objective laboratory and waterborne testing with subjective operational assessments
- Rapid development, testing, fielding, and insertion of autonomous unmanned/uncrewed surface vehicles and safe navigation solutions
- Safe and effective mission assurance through tailored integrated product support strategies and services
- Quick and responsive support to the Fleet through quality in-service engineering

Southeast Alaska Acoustic Measurement Facility (SEAFAC)
Ketchikan, Alaska

The Southeast Alaska Acoustic Measurement Facility is the Navy's west coast asset for making high fidelity acoustic signature measurements.

VALUE ADDED TO THE U.S. NAVY

- Full Scale Submarine and Surface Ship Testing
- Year-Round Dynamic and Static Measurement Capability
- Dedicated Shore Facility with Comprehensive Logistics Support

South Florida Ocean Measurement Facility (SFOMF)
Dania Beach, Florida

SFOMF provides a unique ocean environment, facility, operations, engineering, and logistical support to provide the Navy and the warfighter with the latest technological advantage

VALUE ADDED TO THE U.S. NAVY

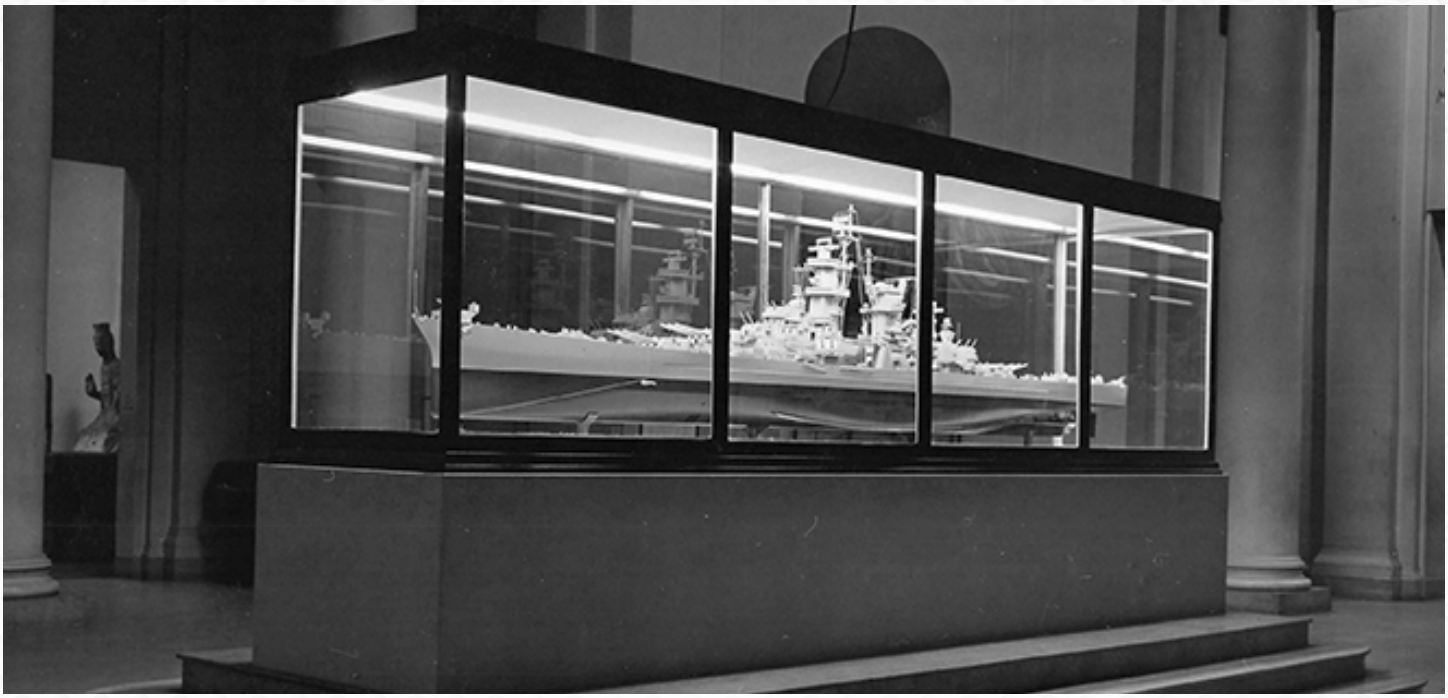
- Quick Access to Deep Water for Greater Testing Efficiency
- Well Characterized Offshore Environment
- Ocean System Design, Fabrication, Testing, and Installation
- World Class Underwater Electromagnetic Measurement Capabilities
- Realistic Assessments of Advanced Underwater Sensors and Systems
- Installation, Recovery and Surveying with ROVs Designed for High Current
- Year Round Operations in a Realistic Littoral Threat Environment

ALL FACILITIES & LABS

- Abusive Battery Test Laboratories
- Acoustic Data Analysis Center (ADAC); located in West Bethesda, Maryland.
- Acoustic Data Processing Center (ADPC); located in Silverdale, Washington.
- Acoustic Pulse Tube Facility
- Acoustic Research Detachment (ARD); located in Bayview, Idaho.
- Acoustic Signatures Technology Complex/Anechoic Flow Facility; located in West Bethesda, Maryland.
- Acoustic Trials Detachment (ATD); located in Titusville, Florida.
- Additive Manufacturing Fabrication Facility
- Additive Manufacturing Research Laboratories
- Advanced Ceramics Laboratories
- Advanced Nondestructive Testing and Evaluation Imaging Facility
- Alloy Development, Heat Treatment, and Metallic Materials Processing Laboratories
- Attritable Systems Laboratory
- AM Prototype and Production Lab
- Analytical Wet Chemistry Laboratory
- Ballast Water Research Laboratory (BWRL)
- Battery Cell and Small Battery Abuse Test Area
- Battery Electro-Chemical Temporary Storage Edifice
- Battery Inspection and Instrumentation Facility
- Battery Performance and Cycling Laboratories
- Bearing Grease Testing Laboratory
- Center for Innovation in Ship Design
- Circulating Water Channel (CWC)
- Craft Instrumentation and Calibration Lab
- Cold Spray Laboratory
- Composites Laboratory
- Craft Systems Integration Lab
- David Taylor Model Basins (5 basins)
- Deep Submergence Pressure Tank Facility
- Detachment Puget Sound Acoustic Data Processing Center (ADPC); located in Silverdale, Washington.
- Dimensional Metrology Lab
- Dosimetry Laboratories
- Dynamic Measurement Laboratories
- Expeditionary Power Systems and Experimentation Laboratory
- Explosives Test Pond Complex
- Hazardous Materials Control and Management Laboratory
- High Voltage Battery Test Area
- Hybrid Power Systems Test Area
- Infra-Red Measurement and Modeling Facility; located in West Bethesda, Maryland.
- Integrated Computational Materials Engineering Laboratory
- Large Cavitation Channel (LCC); located in Memphis, Tennessee
- Large Scale Grillage Test Facility
- Liquid Waste S&T Laboratory
- Low Observable Materials Laboratories
- Low Turbulence Wind Tunnel
- Machinery Automation and Controls Facility
- Magnetic Fields, Electrolytic & Deperming Facility; located in West Bethesda, Maryland
- Maneuvering and Seakeeping Basin (MASK)
- Manned Craft RDT&E Test Bed
- Marine Coatings Laboratories
- Marine Corrosion Control and Evaluation Laboratories
- Marine Organic Composites Laboratories
- Materials and Battery Fire Test and Evaluation Laboratories
- Materials for Hypersonic Vehicles RDT&E Laboratories
- MCM-1 Class Degaussing System Depot Repair Facility; located in Corpus Christi, Texas.
- Mechanical Metallurgy Laboratories
- Metal Forming and Cutting Facilities
- Mission Support Facility
- Network Integration and Fiber Optics Facility
- Noise Tested Bearings Facility
- Nondestructive Testing and Evaluation (NDT&E) Facility
- Non-oily Wastewater Laboratory
- Oil Pollution Abatement Laboratory
- Outboard Engine Test Center
- Physical Metallurgy and Magnetism Laboratory
- Polymer Science Laboratory
- Propeller Fabrication Tool Room (PFTR)
- Prototype Development Facility/Signature Trainers; located in West Bethesda, Maryland.
- Prototype & Model Fabrication Facility (GMAW, GTAW, SMAW)
- Radar Cross Section (RCS) Measurement, Processing and Modeling Facility; located in West Bethesda, Maryland.
- Radiation Detection Range and Test Facility
- Renewable Energy Test Facility
- Research Vessel Lauren
- Robotic Welding and Automation Laboratory
- Rotating Arm Facility
- Rubber Laboratory
- Sanitary Solid Waste Treatment Laboratory
- Science & Technology Battery Performance Test Area
- Ship Motion Simulator Land Based Test Site
- Ship Virtual Prototyping Laboratory
- Solid Waste RDT&E Laboratory
- Southeast Alaska Acoustic Measurement Facility (SEAFAC); located in Ketchikan, Alaska.
- South Florida Ocean Measurement Facility (SFOMF); located in Dania Beach, Florida.
- South Tongue of the Ocean Acoustic Measurement Facility (STAFAC); located in Andros Island, Bahamas.
- Steam Propulsion Support Facility
- Steam Propulsion Test Facility
- Structural Evaluation Laboratory
- Structural Health Monitoring (SHM) lab
- Subsonic Wind Tunnel
- Subtractive Manufacturing (Machine) shops
- Thermal Destruction Test and Evaluation Facility
- Torpedo Strikedown Lift System (TSLS) Land Based Test Site
- Undersea Vehicle Sail and Deployed Systems Facility
- Uniform National Discharge Standards (UNDS) Storage Facility
- USV Autonomy Lab and Integration Center
- USV RDT&E Test Bed
- Water Tunnels 36” Variable Pressure
- Welding and Allied Processes Laboratory
- Welding and Thermomechanical Processing Materials Simulation Laboratory
- Wet Chemistry & Battery R&D Laboratories
- X-Ray Photoelectron Spectroscopy (XPS) Laboratory

CURATOR
OF SHIP MODELS

The U.S. Department of the Navy (DoN) Ship Model Program collects, preserves, interprets, and displays scale models in federal museums and offices and in state and local public educational museums and facilities. Depicting the rich tradition, historical heritage, and technological development of the United States Navy from earliest times to the present, the DoN Ship Model Collection is recognized as a precious national treasure.



In 1883, the U.S. Navy's Bureau of Construction and Repair began a policy of constructing and retaining contemporary exhibition-type models of most new classes of warships. Since 1942, the program has been located at the David Taylor Model Basin in West Bethesda, Maryland. Under the auspices of the Bureau's successor, the Naval Sea Systems Command, the collection has grown to about 3,000 models.

The staff is composed of a curator and ship model conservators. There is a capacious workshop/laboratory outfitted for ship model research, conservation, and construction. Most of the 3,000 models in the collection are loaned to other institutions for display and few are in storage at the Model Basin. The program maintains paper, photographic, and electronic records concerning the condition, origin, history, and location of models in the collection.

The program does not have a museum dedicated to displaying the models. Models located at the West Bethesda office are chiefly those undergoing conservation or in transit. Relatively few are in storage. The Navy Museum in Washington, D.C., displays the largest numbers of the program's models. However, many other museums nationwide have borrowed and currently display elements of the collection.

The Ship Model Program is jointly sponsored by the Naval Sea Systems Command; the Navy History and Heritage Command; and the Naval Surface Warfare Center, Carderock Division.

DEPARTMENTS
TECHNICAL AND BUSINESS

NSWC Carderock Division is organized into several departments, referred to as “Codes,” based on the work they do to support the fleet.

Comptroller Department

The Comptroller Department provides fiduciary oversight for NSWCCD’s fiscal operations and is responsible for providing financial management and fiscal services including budget formulation/execution, accounting, travel and payroll support, audit (FIAR) and fiscal policy support.

- Budget
- Accounting
- Employee Services
- Support
- Operations

Contracting & Acquisition Department

The Contracting and Acquisition Department provides acquisition products and services that meet or exceed customer expectations while maintaining public trust and fulfilling public policy requirements.

- Acquisition Planning & Contact Award
- Contract Administration & Management
- Contractor Performance Assessment Reporting
- Contracting Officer’s Representative (COR) Oversight
- Government Purchase Card Program Oversight
- Policy, Compliance & Training
- ASCC Billing; ASCC Waiver / Reversal Process

Corporate Operations Department

The Corporate Operations Department provides timely and cost-efficient business, tactical and strategic services to Carderock Division and its technical departments.

- EEO Office
- Business Office
- Human Resources
- Infrastructure
- Corporate Communications
- ACIO/Information Technology
- Security
- Corporate Business Office
- Property Management

Code 60

Platform Integrity Department

Platform Integrity Department provides expertise in the overall design and integrity of naval ships as well as ship and weapon systems. This includes full-spectrum research, development, testing, and in-service engineering. We are the Navy's premier provider in survivability, structures, materials and environmental knowledge enabling the fleet and its warfighters to perform missions safely and effectively.

Conduct RDT&E in areas of:

- Materials and Manufacturing
- Fabrication and Technical Support
- Environmental and Energy
- Structures and Composites
- Survivability and Weapons Effects

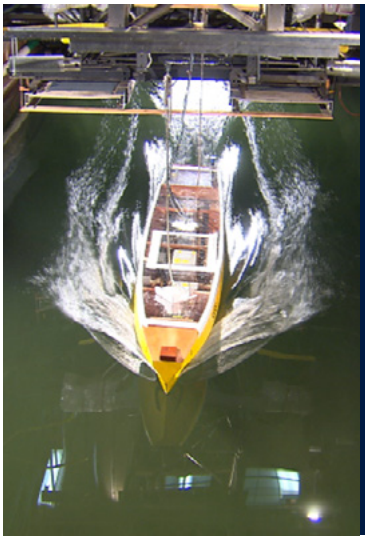
Code 70

Signatures Department

The Signatures Department provides technical solutions to the warfighter that ensure a signatures advantage for Navy submarines, surface ships, and small craft and keep our fleet at sea, capitalizing on the Navy's prior investments in stealth and attendant reduced susceptibility.

Ensuring the Stealth Advantage via:

- Acoustic Signatures Technology
- Electromagnetic Signatures Technology
- Full Scale Signatures Measurement and Analysis
- Signatures Measurement and Management Systems
- Tactical Decision Aids and Signature Trainers
- Other Emergent Signatures



Code 80

Naval Architecture & Engineering Department

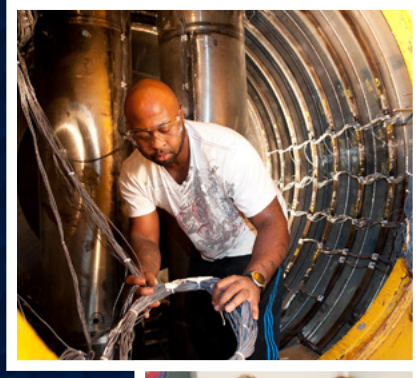
The Naval Architecture & Engineering Department provides naval design, engineering and hydromechanics expertise.

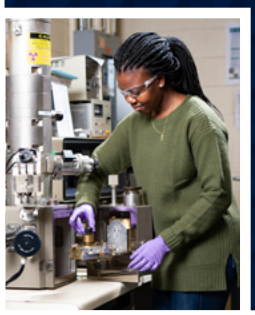
Conduct RDT&E in areas of:

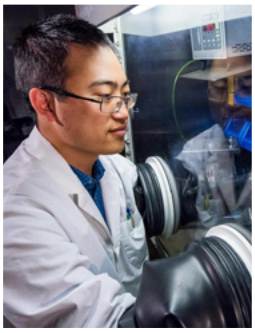
- Ship, Sub and Unmanned Systems Acquisition Engineering
- Future Concepts & Design Integration
- Combatant Craft
- Naval Architecture & Engineering
- Surface Ship Hydromechanics
- Submarine Maneuvering & Control
- Computational Fluid Dynamics & Propulsors
- Maritime, Aviation, & Unmanned Systems
- Modeling & Simulation of Autonomous Systems

Major Programs Supported

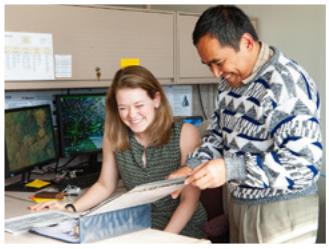
VIRGINIA Class, COLUMBIA Class, SEAWOLF Class, DDG 1000/ DDG 51, Stiletto, Littoral Combat Ship, Unmanned Surface Vessels, Large Surface Combatant, SSN(X), LDUUV/ XLUUV



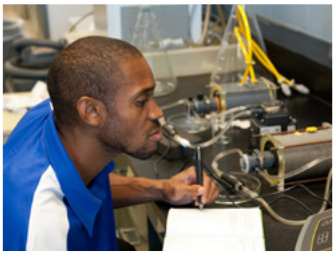



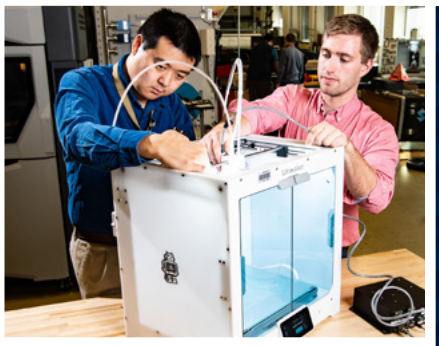










OUR WORKFORCE

Carderock Division houses world-class facilities and laboratories and employs scientists, engineers, and support personnel working in more than 40 disciplines. We offer innovative and meaningful work in supporting U.S. Navy ships and submarines, and the Department of the Navy provides competitive salaries, benefits, and extensive professional development and training.

Our dedicated and talented workforce is recognized for their outstanding work and achievements, providing world-class, cost-effective, and innovative technical solutions for the fleet. The careers and opportunities to make a difference at Carderock are endless!

62% of our workforce are scientists and engineers

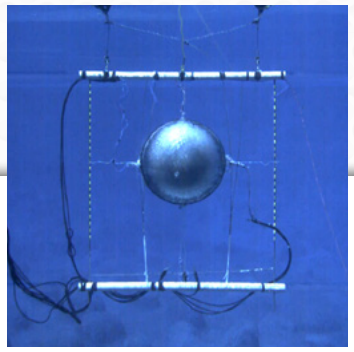
54% of scientists and engineers have advanced degrees

12 YEARS is the average length of service

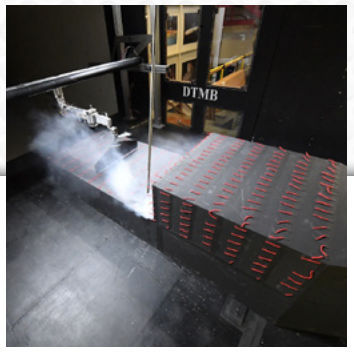
24% of the workforce are military reservists or veterans

TECHNOLOGY
IN ACTION

A model goes through a variety of seakeeping and propulsion tests in the David Taylor Model Basin



Underwater explosive (UNDEX) shock testing conducted at the Explosive Test Pond

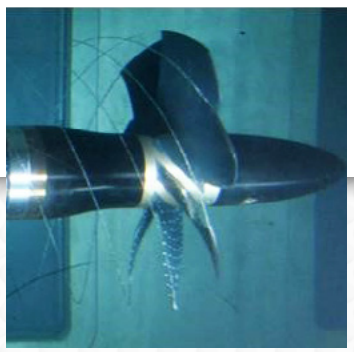


Testing fluid dynamic investigations on scale models inside the Subsonic Wind Tunnel

Full Ship Shock Trials (FSST) conducted on the LCS6 to validate operational survivability after exposure to underwater shock

Full scale submarine acoustic signature measurements at our Southeast Alaska Acoustic Measurement facility

Cavitation test to evaluate propulsor performance



SCIENCE & ENGINEERING

NSWC Carderock Division employs scientists and engineers in a variety of disciplines, who provide critical support to the U.S. Navy's ships and submarines, and the future fleet.

Naval Architects

Naval Architects – and engineers in related technical fields – provide quality naval architectural and ship design services to Navy and non-Navy customers by developing and maintaining ship design tools; researching, developing, and assessing ship concepts and related technologies; and supplying ship design products.

Materials Engineers

Materials Engineers cover the full-spectrum from research, concepts, development, and testing to application of metallic and non-metallic materials for Navy ships, submarines, and Marine Corps ground vehicles and weapon systems.

Physicists

Physicists apply fundamentals of physics, including mechanics, sound, optics, heat, electricity, and magnetism toward the design, development, and evaluation of naval and systems and the solutions of Navy, industrial, and maritime problems.

Software Developers

Software Developers combine real-world physics modeling, real-time high-performance computing, leading edge software design, and sophisticated simulations to produce immersive training and tactical systems for the U.S. Navy.

Mechanical Engineers

Mechanical Engineers apply math and science skills to plan, design, build, operate and maintain Navy systems and ships. They improve and modernize ship and submarine capability including testing ship systems and manage technician teams.

Environmental Engineers

Environmental engineers work in programs supporting the design, development, and testing of state-of-the-art equipment and systems for efficient and effective use within the constraints of the unique shipboard operating environment; integrating the latest in chemical and physical processes for the management and treatment of wastes and materials technology and fabrication methods.

Electrical Engineers

Electrical engineers develop and evaluate power and energy technologies to be used in applications requiring portable power, and coordination of and expertise with battery safety and power generation technologies for Navy systems.

Other Engineering Fields

- Industrial Engineering
- Ocean Engineering
- Civil Engineering
- Aerospace
- Chemical Engineering
- Systems Engineering

BUSINESS & TECHNICAL

In addition to three technical departments, NSWC Carderock Division has business and finance departments, command staff, and skilled trade workers which provide a wide variety of support functions and services.

Comptroller Department

The Comptroller Department provides fiduciary oversight for fiscal operations; fiscal advice and consultation to the command leadership, department heads, and managers; and a full-spectrum of financial management and fiscal services.

Contracting & Acquisition Department

The Contracting and Acquisition Department provides acquisition products and services that meet or exceed customer expectations while maintaining public trust and fulfilling public policy requirements.

Corporate Operations Department

Corporate Operations provides timely and cost-efficient business, tactical and strategic services to the Division and its technical departments. This department includes: EEO & Diversity Office; Human Resources; Infrastructure; Corporate Communications; ACIO/Information Technology; Security; Corporate Business Office; and Property Management.

Cybersecurity

Cybersecurity professionals design and build secure systems as well as identify, analyze, and mitigate threats to information technology (IT) systems and tactical systems. Individuals in this field work on state-of–the art afloat integrated systems, data analysis systems, data archiving and retrieval systems, immersive training systems, and research and development networks.

Command Staff

NSWC Carderock Division command staff includes: Strategic Planning office; Technology and Innovation office; Quality Management; Office of Counsel; Small Business Office; STEM and Outreach Support; and others.

Skilled Trades

The work at NSWC Carderock Division requires all levels of skilled workers in specific trades, such as:

- Metal Workers
- Machinists
- Technicians

EMPLOYEE

BENEFITS

Make an impact and get more than just a paycheck. Our success starts with investing in a dedicated and talented workforce. That's why we're committed to helping you grow with advanced training, ongoing career opportunities, family-friendly flexibilities, and excellent pay and benefits.

Competitive Compensation

Naval Sea Systems Command (NAVSEA) Warfare Centers were designated as a Science and Technology Reinvention Laboratory (STRL). As a STRL Personnel Demonstration Project, compensation is based on broad banding, also referred to pay banding, which allows greater flexibility in setting pay. The overall goal of the Personnel Demonstration Project is to facilitate mission execution.

Work Scheduling / Telework

Flexible work options are available.

- Flexible Work Schedule - Employees work during the pay period with flexible work hours
- Compressed Work Schedule - A compressed schedule included eight nine-hour days and one eight hour day with one day off every two weeks
- Employees who are telework eligible may discuss telework with their supervisor

Advancement Opportunities

- Graduate Education Program
- Scientists and Engineering Development Programs

Financial and Life Planning

- NSWCCD is an eligible employer for the Public Service Loan Forgiveness (PSLF) program. For more information https://studentaid.gov/pslf/
- Eligible retirees receive Federal Government Pensions
- Supplemental 401K equivalent with agency matching up to 5% through the Thrift Savings Plan (TSP)
- Flexible Spending Accounts which allows you to save money for health care expenses. A savings account that helps you pay for items that typically aren't covered by your Health Plan

Leadership Development and Education

- Scientist and Engineer Development Program (SEDP)
- Internal project proposals – have a great idea? Get funding and resources to make it a reality
- Internal and External DoD rotations
- Graduate education assistance

Life Insurance

- Most civilian employees are eligible to participate in the Basic Life and other additional options
- Basic insurance premiums are shared by the employee and the government based on the insurance amount

Health Insurance

- Nationally recognized model offering 200+ health plan options throughout the United States
- Most employees pay only one-fourth of total health benefit costs, depending on the plan selected
- Annual "open season" periods permit enrollment changes
- For more information on the Federal Employees Health Benefits Program visit: https://www.opm.gov/healthcare-insurance/healthcare/

Civilian Navy Perks

- Access to Navy Federal Credit Union
- Transportation subsidy - employees taking public transportation/carpools in some locations may be reimbursed for transportation costs
- Dependent care - the U.S. Navy has outstanding childcare programs and referrals to federal childcare centers: https://public.militarychildcare.csd.disa.mil/mcc-central/mcchome
- "Meet the Fleet" opportunities to visit shipyards and get on-board ships
- Discounted tickets to your favorite places including: local events, museums, and attractions, as well as amusement parks such as Universal Orlando Resort and Walt Disney World.

Flexible Spending Accounts

- Elect pre-tax salary dollars to save money on a variety of eligible health care and dependent care expenses
- Benefits based on length of service and salary
- For more information on Flexible Spending Accounts visit: https://www.fsafeds.com

Length of Service Annual Leave Earned Annual Rate

Leave accrual is based on your years of service:

4 Up to 3 years earns 4 hours/pay period (13 days/year)

6 3 to 15 years earns 6 hours/pay period (20 days/year)

8 15 years or more 8 hours/pay period (26 days/year)

11 Paid Holidays

13 Days of Sick Leave

Retirement Coverage

- Retirement pension for life
- Benefits based on length of service and salary
- Military service may be credited toward retirement (deposit required)
- Vesting after 5 years of creditable civilian service
- Eligibility for survivor and disability benefits after 18 months of civilian service
- Earn Social Security Benefit

Thrift Savings Plan (TSP)

- Tax-deferred retirement savings and investment plan
- Employees offered same type of savings and tax benefits that many private corporations offer employees under 401K plan
- By participating in the TSP, employees have the opportunity to save part of their income for retirement
- Receive matching agency contributions which reduces current taxes in TSP
- All federal employees covered by FERS are eligible to participate in the TSP when hired
- Once eligible to participate in TSP, there are three types of contributions that may be made to their account: (1) agency automatic 1% contributions (2) employee contributions (3) agency matching contributions

Continued Education Support

- Activities may pay all (or part) of the necessary expenses of training – including the costs of college tuition for training and education – to improve an employee's performance of his or her official duties

Public Service Loan Program

- Carderock is an eligible employer for the Public Service Loan Forgiveness Program (PSLF)
- The PSLF Program forgives the remaining balance on your Direct Loans after you've made the equivalent of 120 qualifying monthly payments under an accepted repayment plan, and while working full-time
- For more information visit: https://studentaid.gov/pslf/

DONCEAP – Department of the Navy Civilian Employee Assistance Program

- Provides a wide range of employee assistance and work/life services to employees and their families: https://magellanascend.com/

Work Life and Wellness

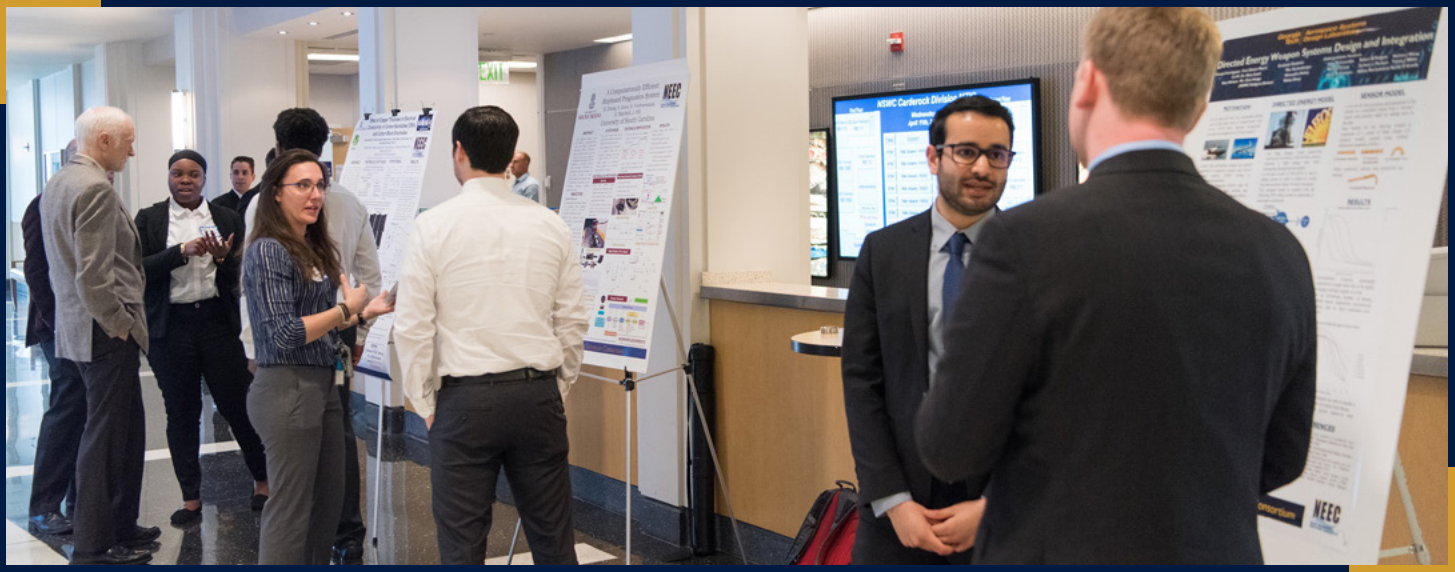
- Flexible Work Environment
  - Compressed schedules
  - Telework
- Paid Overtime
- Paid Holidays, Vacation & Sick Leave
- 11 Paid Holidays per year
- 13-26 days of vacation (annual leave) per year and carry-over up to 30 days into the next year
- 13 days Sick Leave per year – unlimited accrual
  - Federal workers can earn 13 days of sick leave per year at a rate of four hours every two weeks
  - Unused sick leave can be carried into subsequent years and accumulated during the entire year of employment
  - Portion of accumulated sick leave will be calculated into retirement as years of service
- Annual Leave
  - Depending on time in service, federal workers earn between 13 and 26 days of Annual Paid Leave per year
  - Carry up to 30 vacation days into the next calendar year

Paid Parental Leave: Family and Medical Leave Act provides qualifying federal employees up to 12 weeks of paid parental leave for the birth or placement of a child

Family and Medical Leave Act (FMLA) allows up to 12 weeks per year of unpaid leave caring for a sick family member

- Leave sharing programs allow co-workers to transfer leave to others in need
- Nursing Mothers' Room
- Intramural/Team Sports: Volleyball, Ultimate Frisbee, Softball, Cycling, Climbing, Hiking, etc.
- On-site fitness centers

RESEARCH
OPPORTUNITIES



The development of the current and future naval workforce is a primary goal of the command. Numerous programs are available to students, academic faculty and naval scientists and engineers. These programs include internships and mentorships, as well as professional development opportunities.

Summer Faculty Research Program

NSWC Carderock Division is a regular participant in the Office of Naval Research (ONR) sponsored Summer Faculty Research Program. This program provides an opportunity for faculty members to participate with engineers and scientists at NSWC Carderock Division in research of mutual interest. The visiting faculty members are able to take the experience of working with Carderock engineers and scientists in a professional environment back to their home institutions at the end of the program. Learn more: http://onroutreach-summer-faculty-research-sabbatical.com/summer-faculty-research-program

Sabbatical Leave Program

The Sabbatical Leave Program provides fellowship appointments to science and engineering faculty members from institutions of higher education to participate in research of mutual interest to the faculty member and peers at U.S. Navy Laboratories. You can find more information here: http://onroutreach-summer-faculty-research-sabbatical.com/sabbatical-leave-program

Naval Engineering Education Consortium (NEEC)

The Naval Engineering Education Consortium (NEEC) cultivates a world-class naval engineering workforce through student participation in project-based research conducted at colleges and universities. Directed by NAVSEA Warfare Center headquarters and implemented at 10 Divisions across the country, NEEC projects target the Navy's most relevant technology needs. Learn more: https://www.navsea.navy.mil/Home/Warfare-Centers/Partnerships/NEEC/

INTERNSHIP OPPORTUNITIES

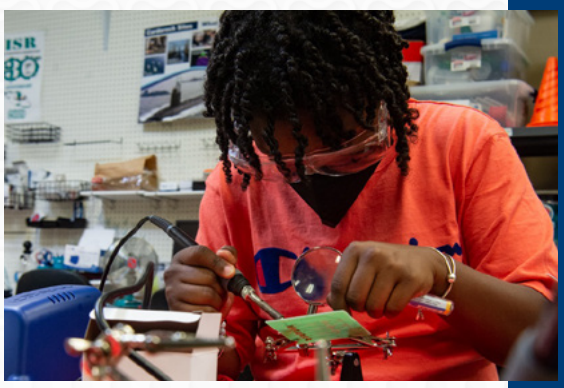
We are always looking for bright, motivated future naval architects, engineers, and scientists to help us deliver innovative and creative technical solutions. Summer interns are provided the opportunity to participate in meaningful technical research, development, test and evaluation to solve real world fleet issues. As part of the internships, students integrate into project teams to conduct research, advance mission capabilities or solve fleet issues. Students are also exposed to local research and operational commands through lab tours and site visits to broaden their understanding of the Navy's mission and future opportunities.

Naval Research Enterprise Internship Program (NREIP)

NREIP is a 10-week paid summer internship program that provides an opportunity for undergraduate and graduate students to participate in research at a Department of the Navy laboratory during the summer. Additional information for NREIP can be found at: https://www.navalsteminterns.us/nreip/.

Science and Engineering Apprenticeship Program (SEAP)

SEAP is an 8-week paid summer internship program that provides an opportunity for high school students to participate in research at a DoN laboratory during the summer. Additional information for SEAP can be found at: https://navalsteminterns.us/seap/.



STEM Student Employment Program (SSEP)

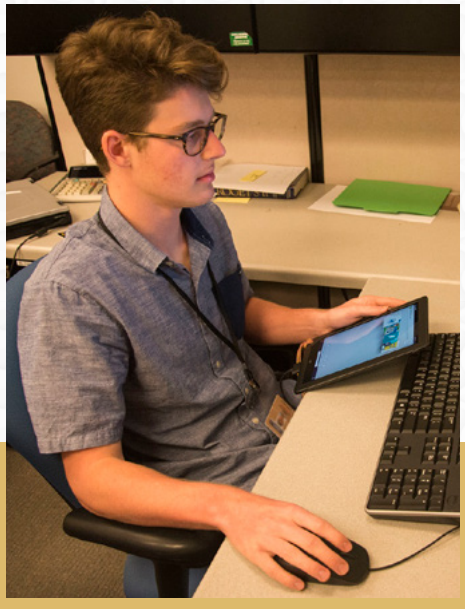
This is a paid internship program for undergraduate and graduate degree seeking students enrolled in STEM majors. Students gain work experience directly related to an academic field of study, and an opportunity for conversion to a permanent employee upon completion of the program. Applications are accepted year-round. Interested applicants can find the PAACTSEP Application on our internship page: https://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Carderock/STEM/Internships-University-Engagement/.

Science, Mathematics and Research for Transformation (SMART) Scholarship

The SMART Scholarship for Service Program is an opportunity for students pursuing an undergraduate or graduate degree in science, technology, engineering, and mathematics disciplines to receive a full scholarship and be gainfully employed upon degree completion. Carderock selects several SMART applicants each year. Additional information for the SMART Scholarship can be found at: http://www.smartscholarship.org/.

Professional, Administrative, Assistant, Clerical and Technician Student Employment Program (PAACTSEP)

This is a paid internship program for undergraduate and graduate degree seeking students interested in Administrative/Technical and General Support positions. Students gain work experience directly related to an academic field of study, and an opportunity for conversion to a permanent employee upon completion of the program. Applications are accepted year-round. Interested applicants can find the PAACTSEP Application on our internship page: https://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Carderock/STEM/Internships-University-Engagement/.



STEM PROGRAMS

Naval STEM creates an inclusive science, technology, engineering, and mathematics (STEM) culture that pioneers innovation and propels the Department of the Navy and Nation's workforce forward. Our mission is to deliver Naval STEM education and outreach opportunities that inspire curiosity and shape a generation of talent prepared for future global challenges

Operation Carderock: FIRST LEGO League Competition

NSWC Carderock Division employees sponsor local elementary and middle school students as part of the FIRST LEGO League robotics program. Carderock-mentored FIRST teams are invited to participate in Operation Carderock, a competition modeled after the FIRST LEGO League.

Carderock Math Contest

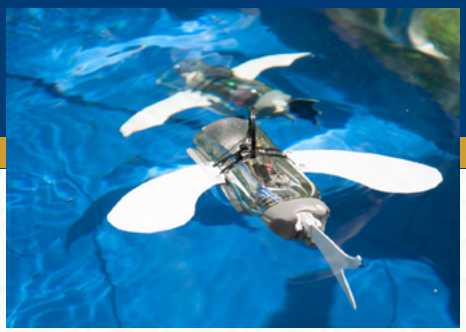
A mathematics competition for middle school students (Grades 6-8) to test their math capabilities for speed, critical thinking and teamwork. It's a day-long event featuring a MATHCOUNTS-style competition, interactive tours and a presentation aimed at encouraging middle school student interest in STEM-based career fields.

SeaPerch

SeaPerch is a hands-on, project-based engineering program which allows students to build their own remotely operated underwater vehicle, with national competition components run by the Office of Naval Research (ONR). Students can visit Carderock to test their self-made submersibles in preparation for regional competitions.

SeaJelly

Build your own free-swimming biomimetic platform with help from the Navy's first soft robotics STEM initiative. The SeaJelly project includes open-source CAD and PCB designs, Arduino code, build instructions, and reference materials. It is a great way to learn new concepts, gain hands-on experience, and encourage creativity.



SeaGlide

NSWC Carderock Division engineers teach middle and high school students how to design and build their own SeaGlide, an autonomous underwater gliders. As part of this program, students learn about buoyancy, electrical circuits and electronic sensors, as well as how to build and program a robotic controller.

Seaplane Challenge

The Challenge was created at NSWC Carderock to teach and excite students about aviation, aerodynamics, hydrodynamics, engineering, history, and design. Small teams of students are challenged to build a model glider. They then use the glider to learn about testing, success and failure and compete to see whose glider can fly the farthest.

> "As one of the oldest DoD STEM competitions, ISR advances the opportunities students have with hands-on application in the world of naval engineering. Events like these expose aspiring engineers to careers with the U.S. Navy and DoD enterprise."

International Submarine Races

NSWC Carderock Division is host to the International Human-Powered Submarine Races. Teams representing universities and high schools from across North and South America, Europe and the Middle East build human-powered submarines. The week-long contest, held in NSWC Carderock Division's David Taylor Model Basin, inspires and encourages students to display their talents and problem-solving capabilities in submarine and hull design challenges. Students design and build their own "wet" human-powered submarine, where contestants breathe SCUBA from onboard air supply.

Seaworthy STEM™ in a Box

Seaworthy STEM™ in a Box is a Navy initiative to provide enhanced Naval-relevant, standards-aligned, hands-on activities to K-12 teachers and students. Learn more: https://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Carderock/STEM-Outreach/Seaworthy-STEM-In-a-Box/

Educator Training

The Seaworthy STEM™ in a Box kits were designed to support teachers as they select content, acquire materials and implement more hands-on STEM activities in their classrooms. The activities are grouped by themes and grade level to ease integration into educational environments and streamline training for volunteers.

The various themed and standard-aligned resources allow teachers to develop their own curricular units to fit different learning environments (e.g. traditional classroom vs. homeschool, single grade level vs. multiple grade levels, one-hour instruction vs. multiple hour instruction, etc.), student developmental needs, and schedules.

Components of this program include: Open-source and free documentation for all activities; NGSS-aligned activities connected to real-world context from Navy scientists and engineers; and free educator workshops for each kit led by educators and engineers.

Student Engagement

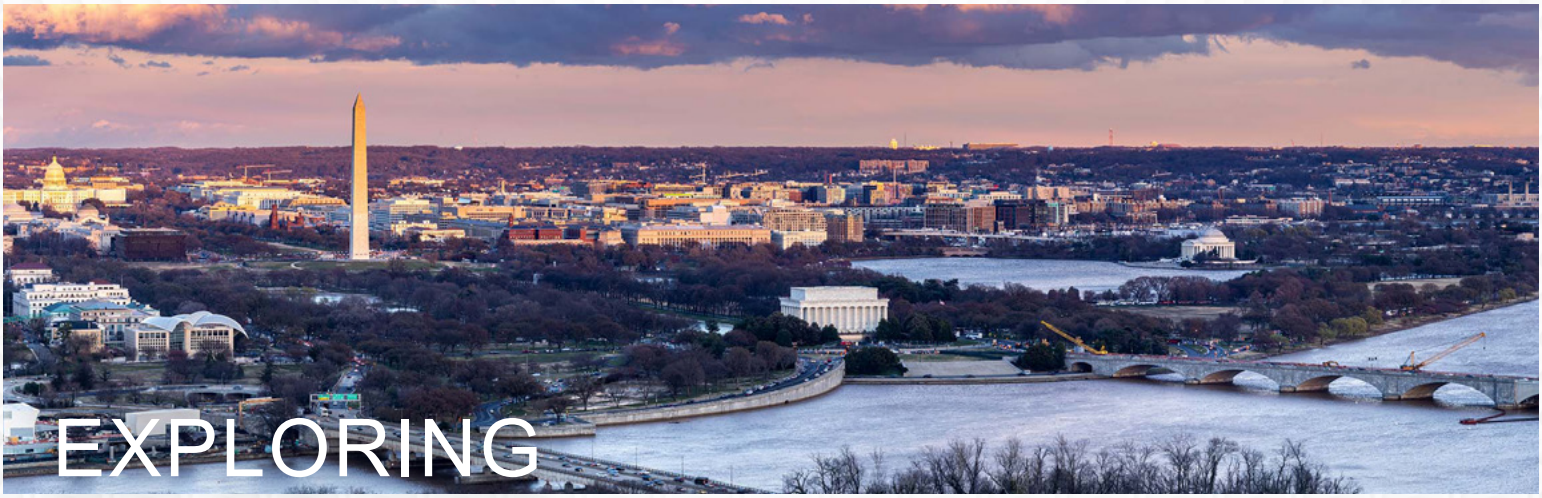
The Seaworthy STEM™ in a Box kits were designed to guide students through scientific inquiry-based theory and the engineering design process.

Any activity in the Seaworthy STEM™ series can be done as a stand-alone event, or alongside other similar activities.

The current themed kits target four distinct grade bands: K-2nd, 3rd-5th, 6th-8th and 9th-12th.

- Ocean Creations (Grades K-2)
- Naval and STEM Connections (Grades 3-5)
- Density and Buoyancy (Grades 6-8)
- Innovative Engineering Design (Grades 9-12)

SEAWORTHY STEM IN A BOX



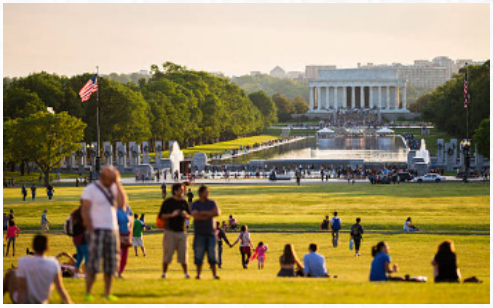
EXPLORING

THE DMV

The National Capital Region, locally known as the DMV (District of Columbia, Maryland, and Virginia), is the metropolitan area centered around Washington, D.C. It's an exciting area with a plethora of things to do and see, with a little bit of everything including cities, mountains, beaches, museums, national parks, award-winning restaurants, and more!

Washington, D.C.

D.C. is a vibrant and diverse city with its own blend of culture, dining, and entertainment. From the iconic monuments and museums along the National Mall to the diverse neighborhoods full of culinary delights and vibrant street art, there's something for everyone. No matter if it's sightseeing, sports, or culinary delights, Washington, D.C. promises an unforgettable experience for any one.



Maryland

Maryland is where bustling cities meet picturesque coastlines and waterways. Step into the maritime charm of Annapolis, home to the prestigious U.S. Naval Academy, or immerse yourself in the dynamic energy of Baltimore, the cultural heartbeat of the region. Maryland is home to a thriving arts scene and boasts numerous festivals, events, sporting spectacles, and outdoor recreation.

Virginia

Virginia has a captivating blend of historic landmarks, scenic landscapes, and vibrant urban centers. From the natural beauty of the Blue Ridge Mountains to the historical charm of Colonial Williamsburg, and the beach front entertainment in Virginia Beach, there's something here for everyone. Whether you're exploring quaint small towns or bustling city streets, Virginia offers culture, history, and natural wonders.

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