

# NSWC Carderock Division's **VISITORS GUIDE**







# 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



# VISITING CARDEROCK

NSWC Carderock Division is located at 9500 MacArthur Blvd. in West Bethesda, Maryland, 20817. It's right outside the "Beltway" of I-495, and next to the Potomac River. The base itself is under the jurisdiction of Navy District Washington and is considered a Naval Support Activity. There is a main gate for all employees and visitors off of Clara Barton Parkway.



## Contact Information:

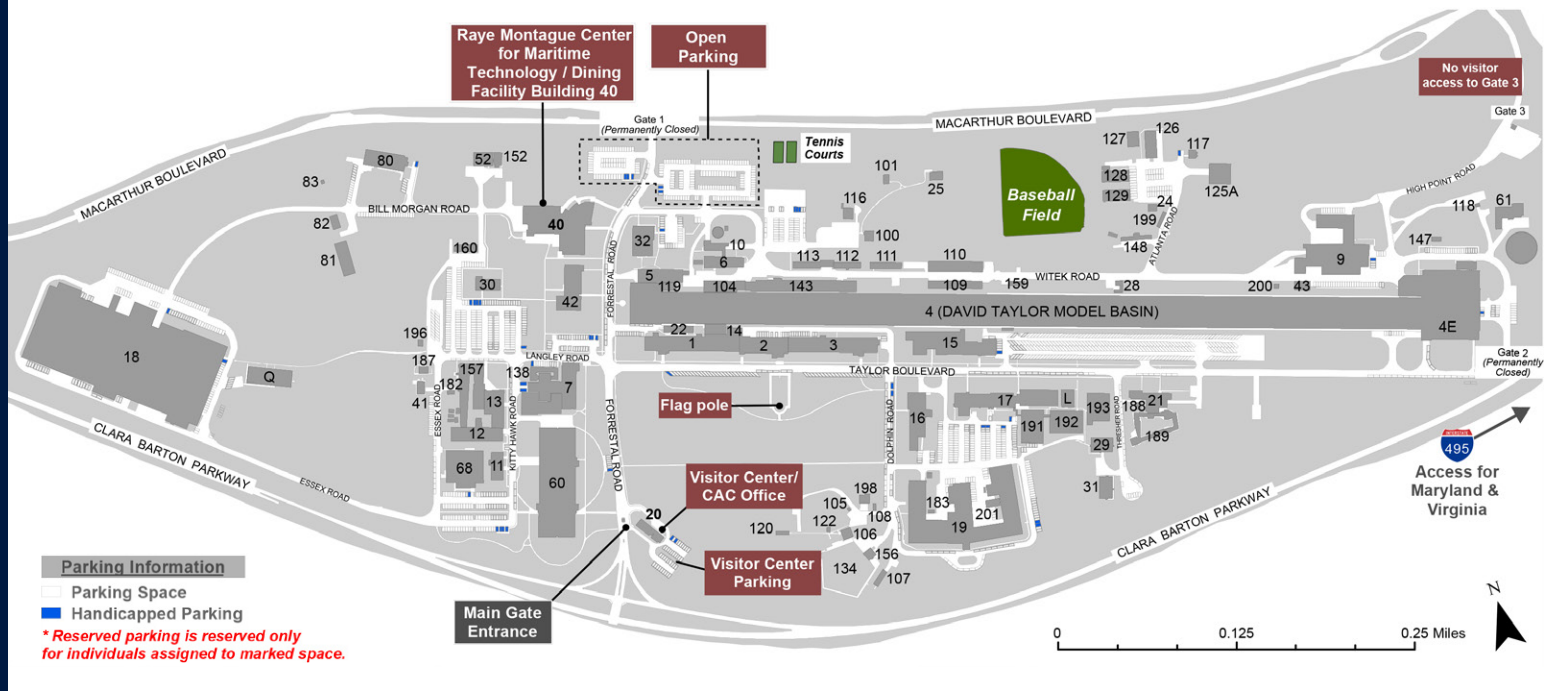
Visitor Center (Bldg. 20): 301-227-1500

Fire & EMS: 202-433-3333 | Police: 301-227-1502

Public Affairs: 301-227-4465

Raye Montague Center for Maritime Technology (Bldg. 40): 301-227-3688





*NOTE: the base mailing address is associated with closed gate 1. Entering "Taylor Boulevard, Potomac, MD" is recommended for mobile navigation app or GPS.*

## DIRECTIONS:

### From Reagan National Airport (15mi/24km):

Take George Washington Parkway (North) from the airport. Exit onto I-495N (Beltway). Stay in the right lane after getting onto I-495. After crossing the American Legion Bridge, take EXIT 41 onto Clara Barton Pkwy toward Carderock. Proceed approximately half mile to the off-ramp leading to the main entrance onto Carderock Division.

### From Baltimore-Washington International Airport (42mi/67km):

Take I-195 West to I-95 South. Exit onto I-495, take EXIT 41 onto Clara Barton Parkway toward Carderock. Proceed approximately half mile to the off-ramp leading to the main entrance onto Carderock Division.

### From Dulles Airport (19mi/30km):

Take the Dulles Access Road (267) to the I-495N exit toward Maryland (approximately 12 mi. from the airport). After crossing the American Legion Bridge, take EXIT 41 onto Clara Barton Parkway toward Carderock. Proceed approximately half mile to the off-ramp leading to the main entrance onto Carderock Division.

**Parking on base:** You may park in any non-reserved, non-numbered space. Request specific parking instructions from your host.





## Where to Stay

Being in the D.C., Maryland, Virginia (also known as the DMV) area, there are many options for lodging. The areas of **Tysons Corner, Virginia; Bethesda, Maryland; and Rockville, Maryland** are all within easy commuting distance to Carderock.

For government employees using the **Defense Travel System**, input **20817** for zip code to coordinate the best hotel at the government rate.

## Food Options

### ON-SITE OPTIONS:

#### Cafeteria:

Lann Sann Sushi and Noodle House is located inside the cafeteria of the Raye Montague Center for Maritime Technology (Bldg. 40). Business hours are from 6 a.m. to 3 p.m. during the week days.



### OFF-SITE OPTIONS:

#### MacArthur Plaza eateries (2.1 miles away):

**Fish Taco (Cabin John location):** <https://fishtacoonline.com/menu/>

**Market on the Boulevard:** <http://themarketon.com/sandwichmenu.html>

**Wild Tomato:** <https://wildtomatorestaurant.com/wild-eats/>

#### Old Anglers Inn (3.4 miles away)

**Old Anglers Inn:** (<https://oldanglersinn.com/>) *Open on Wed, Thurs, and Fri.*

Nice place for an after-hours social gathering/dinner. Online lunch orders are available.

#### Potomac Village eateries (5 miles away):

**Vie de France bakery (Potomac, MD location):** <http://www.viedefrance.com/>

**Starbucks (River Road, Potomac, MD location):** <https://www.starbucks.com/>

**Chipotle (River Road, Potomac, MD location):** <https://www.chipotle.com/>

**Five Guys (Falls Rd, Potomac, MD location):** <https://restaurants.fiveguys.com/9812-falls-rd>

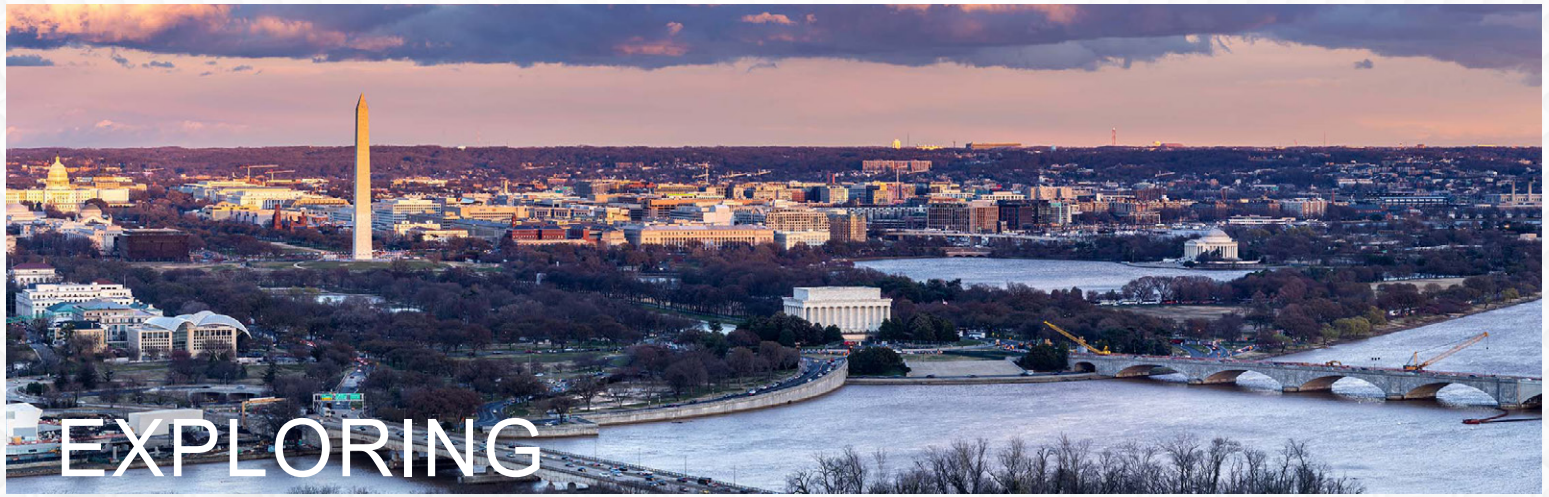
**Moby Dick House of Kebabs (Potomac, MD location):** <https://www.mobyskabob.com/>

**Potomac Pizza (Potomac, MD location):** <https://www.potomacpizza.com/>

**Bagels 'n Grinds (Potomac, MD location):** <https://www.bagelsngrinds.com/>

**FireWok@Potomac:** <https://www.firewokmd.com/>



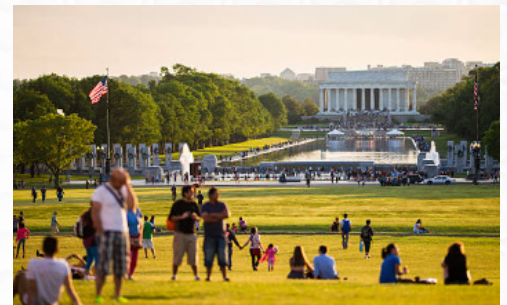


# EXPLORING THE DMV

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.



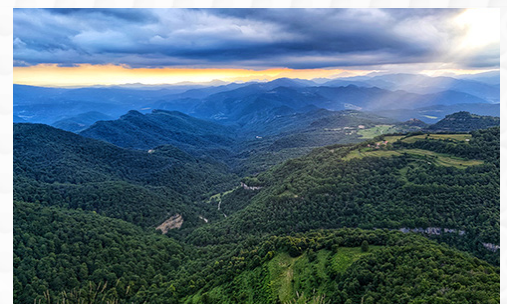
## Maryland

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.





# MORE ABOUT CARDEROCK





# 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.

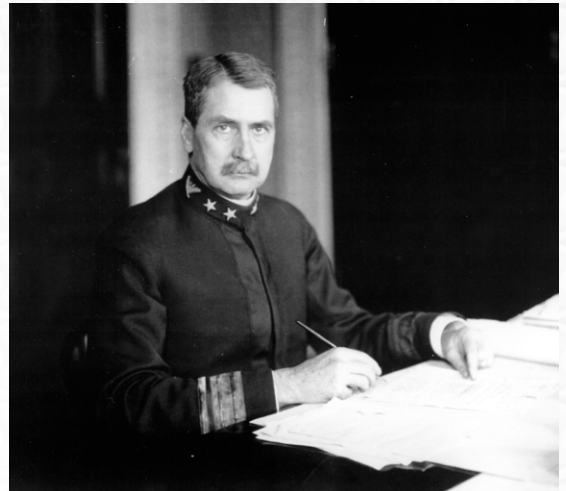
Taylor was instrumental in convincing Congress of the value of tow tanks and model tests in support of our nation's defense mission. To pursue this, he designed and supervised construction of the Washington Navy Yard's Experimental Model Basin (EMB).

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

1896

Experimental Model Basin established at the Washington Navy Yard



1937

1937

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



1967

1967

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



1967

1967

Combatant Craft Detachment established (Little Creek, Virginia)



2008

2008

Twisted Bicone Arrays installed at STAFAC, SEAFAC



2013

2013

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

# 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.

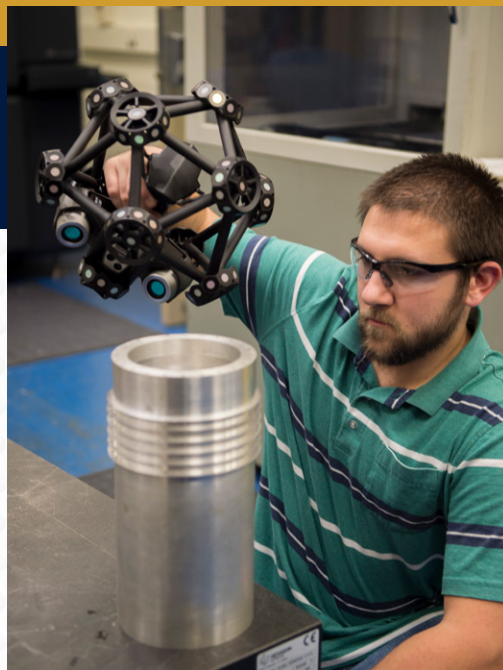




# FACILITIES & LABS

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.

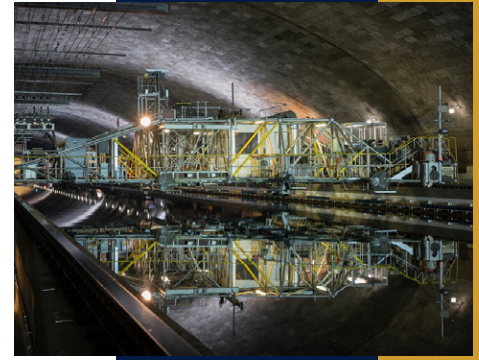
While analytical models and analysis techniques have been developed and are being continually refined, facilities are still needed to validate the models/techniques and to ensure that new ships meet performance specifications on delivery and operational units continue to perform as designed before going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





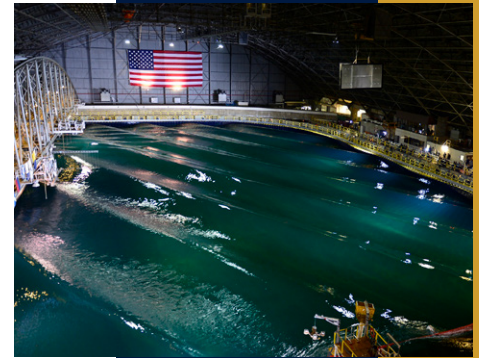
## David Taylor Model Basin

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.



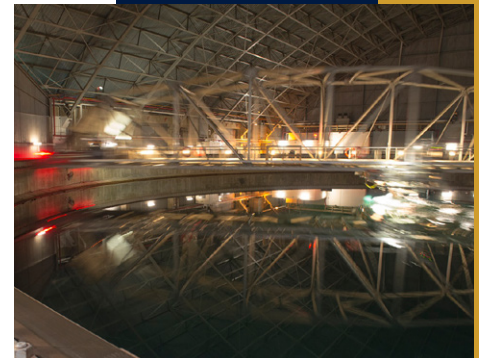
## Maneuvering and Seakeeping Facility (MASK)

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.



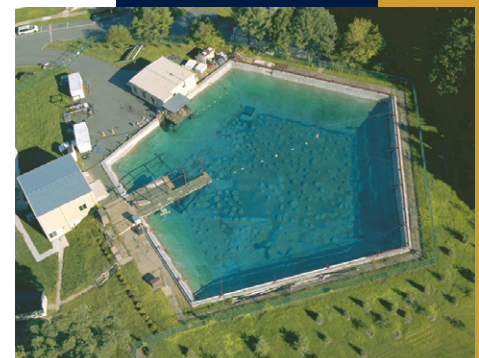
## Rotating Arm Facility

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.



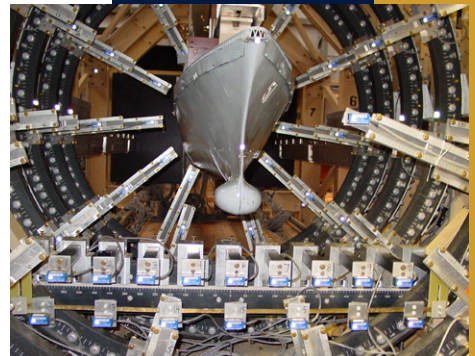
## Model Fabrication Facility

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.





# 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.



Code 01

### 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



Code 02

### 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



Code 10

### 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.

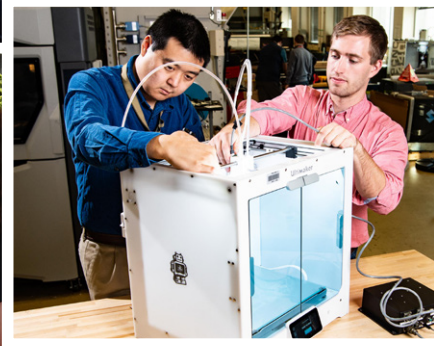
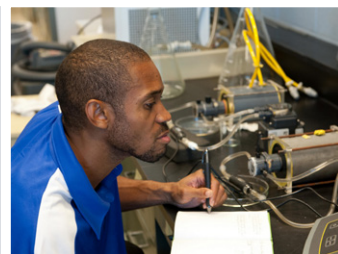
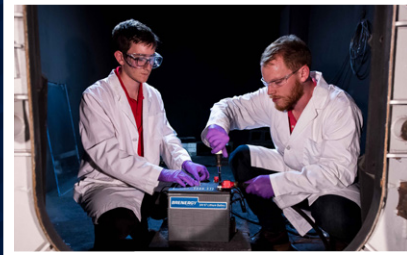
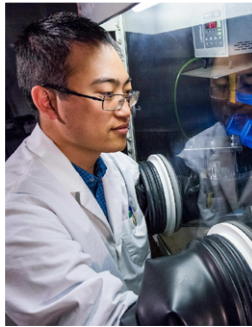
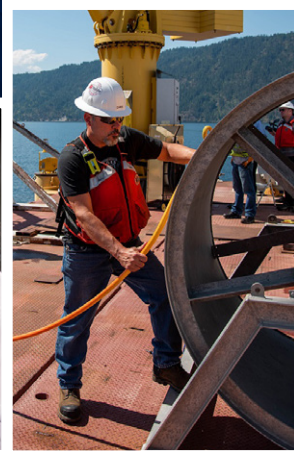
Conduct RDT&E in areas of:

- 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)







# 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



SCAN TO  
LEARN MORE



<https://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Carderock/>

*Approved for Public Release*