

NSWC CARDEROCK DIVISION

NAVAL SURFACE WARFARE CENTER

FY2024 Highlights

- ❖ **Arctic Ops Assessment:** NSWC Carderock Division conducted a comprehensive assessment of the acoustic signature of a Virginia-class submarine operating in the challenging Arctic environment. This involved taking detailed measurements and comparing them with previous evaluations to understand how extreme cold-water conditions impact acoustic posture. The analysis from this assessment will be used to inform future operational guidance and submarine design.
- ❖ **Autonomous Systems:** NSWC Carderock Division successfully integrated government Autonomy Baseline (ABL) software and the Common Control System (CCS) onto a Global Autonomous Reconnaissance Craft (GARC) during trials at Naval Station Norfolk. This involved conducting 15 underway missions to test the GARC's autonomous capabilities over different communication paths. This effort directly supports the Navy's Unmanned Program and enhances the autonomy of critical reconnaissance platforms.
- ❖ **Validation of LHD Advanced Manufacturing Work Centers:** NSWC Carderock Division delivered advanced manufacturing work center equipment and validated proper function prior to deployment of USS Wasp (LHD 1) at Naval Station Norfolk. The team also completed follow-on equipment inspections aboard USS Bataan (LHD 5) after its deployment. The equipment installed on the ships are R&D thrusts related to Laser-Wire Directed Energy Deposition and continuous-fiber composite Material Extrusion Additive Manufacturing. These technologies increase capabilities for shipboard engineering repair actions.



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Naval Surface Warfare Center (NSWC) Carderock Division is the Navy's center of excellence for ships and ship systems. For over 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 Navy fleet of the 21st Century. NSWC Carderock Division's expertise spans from naval architecture and marine engineering, to electrical and mechanical engineering, to computer engineering and physics.

NSWC Carderock Division specializes in ship design and integration; environmental quality systems; hull forms and propulsors; structures and materials; signatures, silencing systems, and susceptibility; and vulnerability and survivability systems.

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.

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.

NSWC Carderock Division will continue to solve challenging engineering problems to meet future fleet needs.

Mission

To provide full-spectrum research and development, test and evaluation, analyses, acquisition, and fleet support for the Navy's ships, ship systems, and associated Navy logistics systems. Specific emphasis is to provide the core technical capabilities required for the integration of surface and undersea vehicles and associated systems, to develop and apply science and technology associated with naval architecture and marine engineering, and to provide support to the maritime industry.

Vision

To be the Navy's trusted partner for identifying and providing world-class, innovative, and cost-effective solutions for advanced ship and ship systems, for providing technical solutions to the warfighter, and to keep our fleet at sea.

Thrust Areas

- Ship, Submarine, and Unmanned Vehicle Design and Integrity
- Advanced Manufacturing
- Digital Strategy
- Signature Management
- Unmanned Mobility Systems

Technical Capabilities

- Ship and Submarine Design and Integration
- Ship and Submarine Acquisition Engineering
- Ship and Submarine Concepts, Analyses of Alternatives, and Design Tool Development
- Combatant Craft and Expeditionary Vehicles
- Unmanned and Maritime Intelligent Autonomous Systems
- Hull Forms and Fluid Dynamics
- Propulsors
- Surface, Undersea, and Weapon Vehicle Materials and Manufacturing Technology
- Surface and Undersea Vehicle Structures
- Alternative Energy and Power Sources Research & Development
- Surface, Undersea and Expeditionary Vehicle Vulnerability Reduction and Protection
- Surface and Undersea Vehicle Acoustic Signatures, Silencing Systems, and Susceptibility
- Surface and Undersea Vehicle Non-Acoustic Topside Signatures, Silencing Systems, and Susceptibility
- Ship Environmental Treatment Systems, Management, and Safety
- Surface and Undersea Vehicle Underwater Electromagnetic Signatures, Signature Mitigation Systems, and Susceptibility
- Fleet Signatures Systems
- Advanced Fabrication of Scaled Pressure Hulls and Scaled Models

Major Facilities

- David Taylor Model Basin — West Bethesda, MD
- Maneuvering and Seakeeping Facility (MASK) — West Bethesda, MD
- Deep Submergence Pressure Tank — West Bethesda, MD
- Anechoic Flow Facility — West Bethesda, MD
- Structure Evaluation Laboratory — West Bethesda, MD
- Explosives Test Pond — West Bethesda, MD
- Ship Materials Technology Center — West Bethesda, MD
- Magnetic Fields Laboratory — West Bethesda, MD
- Subsonic Wind Tunnel — West Bethesda, MD
- Acoustic Research Detachment — Bayview, ID
- Large Cavitation Channel — Memphis, TN
- Southeast Alaska Acoustic Measurement Facility (SEAFAC) — Ketchikan, AK
- South Florida Ocean Measurement Facility (SFOMF) — Fort Lauderdale, FL

Workforce Profile – FY24

- Total Government: 3,065
- Scientists & Engineers: 1,924
- Military: 19
- Total Contractors: 1,279

Advanced Degrees – FY24

- PhDs – 204
- Masters – 855

Patents and Publications (FY20-FY24)

- Patents Issued – 82
- Publications – 151

Technology Transfer (FY20-FY24)

- CRADAs – 319
- PIAs – 17

Total Annual Funded Program – FY24

- Total Obligation Authority: \$ 1.4 billion
- Contracts issued: \$557 million
- Total Obligated to Small Businesses: \$234 million / 44%

Carderock Division Leadership



Dr. Paul Shang
Technical Director (Acting)



CAPT Christopher K. Matassa
Commanding Officer

Carderock Division Sites

