Command Overview

CAPT Rich Blank  
Commanding Officer, NSWCCD

Dr. Joseph T. (Tim) Arcano, Jr.  
Technical Director, NSWCCD
Carderock Division…

We envision the future Fleet, create it, and help sustain it.
Carderock – where the Fleet begins.

Carderock has pushed the envelope in naval science and technology for more than 100 years…
…it all starts with an idea.
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.

• Providing technical capabilities for surface / undersea vehicles and associated systems
• Developing and applying S&T associated with naval architecture / marine engineering
• Supporting 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.
Collaborating across NAVSEA, Warfare Center divisions and the Naval Research and Development Establishment (NR&DE) to place innovative solutions in the hands of the Fleet.
Warfare Center

Quick Facts

- ~22,060 diverse and highly educated employees focused on innovation (~14,700 scientists, engineers, and technicians with ~600 Ph.D.s)
- 128 unique Technical Capabilities (TCs) across 10 Divisions
- Operates under the Navy Working Capital Fund (NWCF) business model
- Disciplined process for accepting and assigning the right work to the right WC Division based on TCs

Part of the Naval Research & Development Establishment (NR&DE)

- Size of the workforce is based on the funded workload
- Performs work our industry partners can’t, won’t or shouldn’t do.
- Maintains more than 164 unique RDT&E facilities

Distribution Statement A: Approved for Public Release; distribution unlimited.
Quick Facts

- Diverse and highly educated workforce with 25,000 scientists, engineers, and technicians (with more than 2,000 Ph.D.s)
- 20 commands across the NAVAIR/NAVSEA Warfare Centers, SPAWAR Systems Centers, ONR and NRL
- Conducts RDT&E for the DoN to discover, develop, transition and field technologically superior naval warfighting capabilities.
- Unique Naval RDT&E facilities including laboratories, test facilities and test ranges
- Serves as principal R&D agents for Navy and Marine Corps Program Executive Offices
- Aggressive Research, Development, Test & Evaluation for reliable real world solutions.

Organizationally aligned to Naval Systems Commands and ONR
- Naval Sea Systems Command (NSWCs, NUWCs)
- Naval Air Systems Command (NAWCs)
- Space and Naval Warfare Systems Command (SSCs)
Carderock Sites

Where We Work

Southeast Alaska Acoustic Measurement Facility (SEAFAAC)
KETCHIKAN • ALASKA

Puget Sound Detachment at Naval Submarine Base Bangor
BANGOR • WASHINGTON

Memphis Detachment
Dr. Wm. B. Morgan Large Cavitation Channel
MEMPHIS • TENNESSEE

South Florida Ocean Measurement Facility (SFOMF)
FT LAUDERDALE • FLORIDA

South TOTO Acoustic Measurement Facility (STAFAC)
ANDROS ISLAND • BAHAMAS

Carderock Division HEADQUARTERS
WEST BETHESDA • MARYLAND

Norfolk Detachment
Combatant Craft Division
NORFOLK • VIRGINIA

Acoustic Research Detachment
BAYVIEW • IDAHO
Unique Facilities

- Explosives Test Pond
- Anechoic Flow Facility
- Structural Mechanics Lab
- David Taylor Model Basin
- 36” Water Tunnel
- Ship Materials, Structures & Survivability
- Model Fabrication Facility
- Coatings Facility
- Electromagnetic Facility
- Subsonic Wind Tunnel
- Maneuvering & Seakeeping (MASK) Basin
- Maritime Technology Information Center
- Center for Innovation in Ship Design (CISD)
- Curator of Ship Models
- Signature Trainer Development Facility

Naval Surface Warfare Center
Carderock

Distribution Statement A: Approved for Public Release; distribution unlimited.
Carderock Naval Surface Warfare Center

Major Customers & Budget

Business Consists of:

Cost reimbursable and direct cite:

NAVSEA PEO SUB
NAVSEA SEA07
NAVSEA SEA05
NAVSEA PEO LCS
NAVSEA PEO SHIPS
NAVSEA SEA21
NAVSEA PEO IWS
NAVSEA PEO CV
NAVSEA SEA06
NAVSEA SEA04
NAVSEA OTHER

$100M $200M

$765 Million

DIRECT LABOR

$495 Million

CONTRACTS

$270 Million

Distribution Statement A: Approved for Public Release; distribution unlimited.
Survivability, Structures, Materials and Environmental Department

Signatures Department

Naval Architecture and Engineering Department
## Major Programs Supported

- **Ohio-Class Replacement**
- **Virginia-Class**
- **Littoral Combat Ships (both variants)**
- **Amphibious and Auxiliary ships**
- **DDG 1000 / DDG 51**
- **Carriers**
- **Combatant Craft**
- **Unmanned Systems**
Our Workforce & Engineers

**TOTAL EMPLOYEES**
- 2,008

**SCIENTISTS & ENGINEERS**
- 1,315

**EDUCATION**
- Bachelors: 899
- Masters: 569
- Doctorate: 160

Distribution Statement A: Approved for Public Release; distribution unlimited.
Before Entry, There’s Outreach

20 to 25 Year Development Timeline

Entry
Developmental Programs
Training
Mentorship
CISD
Rotations
Project Teams
OJT

Journey
Adv Degrees
Certifications
Career Dev

Expert
Tech Authority/
Warrant
SME
HQ Experience

Executive Management Leadership

Along the way – and especially before retirement – there’s Knowledge Transfer by MENTORING!
Coordinated Educational Outreach Programs

- Summer faculty
- Student internships and volunteer programs
- Naval Engineering Education Consortium (NEEC)
- K-12: Sea Perch, MATHCOUNTS, FIRST Lego, Sea Glide, Sea Plane, calculator-controlled robots, field trips, summer STEM camps, Summer STEM teacher institutes

Impact

- 200 schools (MD, VA, DC, ID)
- 7,744 students (K-12)
- 8 Science, Mathematics and Research for Transformation (SMART) students
- 26 Summer faculty
- 101 Science and Engineering Apprenticeship Program (SEAP) students
- 122 Naval Research Enterprise Internship Program (NREIP) students
- 40 student volunteers

International Human-Powered Submarine Races

- Biennial event
  - 24 teams in 2015
  - 6 international
• **NISE – Section 219 Funds**
  – Major innovation catalyst
  – Technical Director’s Innovation Challenge; Disruptive Technology Lab; High-Energy Weapon integration; Additive Manufacturing (3D Printing); Power and Energy

• **Naval Research & Development Establishment Collaboration**
  – 28 WFC projects, 43 other DoD, 41 academia

• **FY16 - $7.9M**

• **39 Technical Papers Generated in FY15**

• **21 Conference or Society Papers in FY15**

• **18 advanced degrees in process in FY15 with 4 graduate degrees completed**
Principal investigator Phil Dudt and summer intern Dante Dobbins research the use of Elastomeric Armor for Combat Helmets to mitigate traumatic brain injury.

Experimental helmets incorporating this coating are being subjected to explosive blast. Output of pressure and acceleration sensors embedded in mannequins are analyzed to determine effectiveness. Findings showed coatings significantly decreased the intra-cranial impulse and acceleration linked to Traumatic Brain Injury.

Work is part of a CRADA between Carderock and DuPont Corporation. U.S. Navy photo by James Contreras.
• Support Our Deploying Forces

• Improving Acquisition Program Outcomes

• Cutting-edge Innovations

We envision the future Fleet, create it and help sustain it.

NSWC Carderock Division –

Where the Fleet Begins