

MISSION IMPACT REPORT

HIGHLIGHTS

“WHERE SCIENCE MEETS THE ART OF WARFARE”

SUMMER/FALL ‘24

BY THE NUMBERS

EDUCATION:

- Current Enrollment: 2,586
 - 1,846 Master’s; 639 Certificates & non-degree; 101 Ph.D.
- Quarterly [Graduations](#) (Summer/Fall):
 - 450 graduates
 - Navy: 149
 - USCG: 2
 - USMC: 52
 - DOD Civ: 103 (69 DL)
 - Army: 52
 - International: 54
 - Air Force: 38
 - (21 countries)

RESEARCH:

- 434 FY24 reimbursable projects
- 114 Naval Research Program projects
- Recent [Theses and Dissertations](#)
 - 21 classified, 96 CUI
- Active partnership agreements: 105
 - CRADA: 50
 - TSA: 4
 - MOA: 22
 - EPA: 5
 - MOU: 20
 - PIA: 4

INNOVATION:

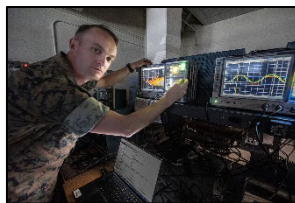
- 11 [new patents](#) issued, 21 submitted
 - 14 invention disclosures
 - 115 [patents for licensing](#)
- 2 [Joint Interagency Field Experimentations](#)
 - 325 participants, 31 experiments in multi-domain UxS and C5ISR
 - Next two JIFX events are:
 - 3-7 Feb: “Sustained Operations”
 - 12-16 May: “C2, Countermeasures”
- [Naval Innovation Center](#) at NPS: NAVFAC held an [NIC Industry Day](#) in Sept. for the NIC and modernization of NPS buildings with more than 100 industry participants.



SPOTLIGHT: Additive Manufacturing - 10 NPS warrior-scholars from the Navy, Marine Corps, and the Army, along with representatives from the school’s Consortium for Advanced Manufacturing Research and Education (CAMRE) conducted applied research at installations and aboard ships during the ’24 RIMPAC exercises with cutting-edge tech producing repair parts with real-world impact. Aboard USS Somers (LPD 25) the team repaired a reverse osmosis pump enabling the ship to stay at sea. [Read story.](#)



CNO NAVPLAN: U.S. Navy CDR Adam Arndt, a career MH-60R helicopter pilot, earned his master's in cyber systems and operations. Arndt's thesis applied new Messaging Layer Security protocol and cryptologic methods to improve aircraft secure UHF communications and speed at sea. **IMPACT:** Part of an ONR-funded research project under the Applied Cyber Resiliency program, the method can be adapted to meet naval-unique needs for ships, autonomy, and space systems. Arndt is headed to command Helicopter Maritime Strike Weapons School Pacific at Naval Air Station, North Island, CA. [Watch video.](#)



Commandant’s Planning Guidance: U.S. Marine Corps Capt. Colin Ball earned his master’s in electrical engineering and the AFCEA John McReynolds Wozencraft Award for Academic Excellence, as well as Outstanding Thesis. Ball’s research on electromagnetic interference (EMI) mitigation focused on optimizing the Navy Integrated Power Electronics Building Block (NiPEBB) funded by ONR. **IMPACT:** This portable power unit is crucial for supporting diverse shipboard operations to meet military EMI standards for fully electric ships and aircraft. [Ball was invited](#) to present his research at the prestigious IEEE Engineering Conference.



EDUCATION – DEVELOPING LEADERS

- Graduations:** 450 graduates crossed the stage in King Hall during the [Summer](#) and [Fall](#) quarter ceremonies pushing the 2024 total to more than 1,000. The Honorable Leon Panetta, 23rd Secretary of Defense, was the [Fall Quarter graduation](#) commencement speaker in Dec. **IMPACT:** Graduates take their advanced degrees and applied research solutions back the operational force to relevant problems before they return to the operational force and staffs. Search student research theses: [Public](#) | [Restricted](#)
- PACOM:** NPS alumnus [ADM Sam Paparo](#), Commander U.S. Indo-Pacific Command, visited NPS in December to hear updates on priority student-faculty research, and gave an all-hands presentation/Q&A on the Indo-Pacific security outlook in the school's premier [SECNAV Guest Lecture series](#). **IMPACT:** Leadership met with the PACOM Commander to identify target needs/actions, and broader engagement with the entire student body is representative of how Fleet integration at NPS enhances education and mission outcomes.
- Indo-Pacific:** Three NPS warrior-scholar students returned from studying Systems Engineering at the [National University of Singapore](#) through a strategic partnership between NPS and NUS' [Temasek Defence Systems Institute](#). **IMPACT:** The unique exchange program enables qualified NPS students to earn degrees from both institutions strengthening alliances between the U.S. Naval forces and Singapore. NPS and TDSI are exploring ways to expand this vital Indo-Pacific strategic partnership [Full Story](#).
- Energy Ops:** The new [Master's of Operational Energy](#) combines three stackable graduate certificates focused on directed energy, refuel logistics, and unmanned systems persistence to provide a holistic view on operational energy (OE). **IMPACT:** Sponsored by the office of the Deputy Assistant Secretary of the Navy for Energy and the Director for Operational Energy office, the OE program is open to military, defense civilians, contractors, and select international students via [NPS Online](#).
- AI:** The Naval AI Hackathon at NPS kicked off in a curriculum-integrated, quarter-long course format that culminated in a 3-day intense capstone event during Finals Days in December. Led by [NPS Computer Science](#) associate professor Mathias Kolsch, the event was supported by [MCTSSA](#) as the project partner working for [MCCLL](#). **IMPACT:** Students and external organizations addressed real-world operational problems with their expertise and an "AI toolchest" of NPS-internal, DOD-wide, and public hardware and software.
- IW:** 10 students in the NPS [Advanced Information Warfare Systems](#) course assessed capabilities from the DOD Strategic Capabilities Office (SCO) for their technical and operational feasibility as well as addressed a classified problem core to one of PACOM's critical operational challenges. **IMPACT:** With input from First Marine Expeditionary Force (I MEF) Information Group (MIG) the students developed and delivered innovative and practical solutions that can be tailored for use to counter the PACOM specified threats.
- NAVEUR:** The first [NPS European Alumni Symposium](#) was held in Garmisch, Germany Sept. 29 to Oct. 3, with more than 100 international participants. In addition, Operations Research professor David Alderson and Elle Hancock from the NPS Center for Infrastructure Defense, delivered a NATO-sponsored course on [Critical Energy Infrastructure Protection](#) and Resilience in Bydgoszcz, Poland, for Ukrainian Military and Government. Also NATO's [Centre for Maritime Research/Experimentation](#) and NPS collaborated on the Climate Change and Security course. **IMPACT:** Strengthened alliances through relevant defense-focused education, research and engagement.





RESEARCH – SOLVING PROBLEMS

- Hypersonics:** U.S. Navy ENS Max Plum, who graduated from NPS in June with a master’s degree in Aerospace Engineering, recently [presented his groundbreaking research](#) in hypersonics, “Flow Characterization of the NPS Supersonic Wind Tunnel,” at the prestigious American Institute of Aeronautics and Astronautics Aviation (AIAA) forum. **IMPACT:** Plum’s work contributed to ONR-funded research and is now in the aviation pilot training pipeline with a massive head start in technical knowledge impacting the future of naval aviation.
- India:** For the 14th year, NPS National Security Affairs department co-hosted an annual U.S.-India Strategic Dialogue, July 30-31 in New Delhi, in partnership with the Observer Research Foundation and with sponsorship from the Defense Threat Reduction Agency (DTRA). **IMPACT:** This cooperation enabled joint research on areas that previously had been too sensitive, such as nuclear safety and security, and produced a definitive and free resource book, “[The Challenges of Nuclear Security: U.S. and Indian Perspectives.](#)”
- Directed Energy:** The NPS-CIRPAS Airborne Research Facility and its unique Twin Otter aircraft are helping Meteorology professor Qing Wang advance her research on improving the Navy’s ability to [predict the optical propagation environment](#) in the coastal region for directed energy applications. **IMPACT:** Through a linked tracking system with visible and midwave infrared cameras, the ONR-funded project will help gain a better understanding of the atmospheric scintillation and attenuation for electro-optical and infrared signals.
- MDA:** NPS Oceanography faculty associate Christopher Miller completed a six-week voyage in the Arctic aboard the Norwegian icebreaker KV Svalbard. **IMPACT:** Miller’s research deployed deep water moorings as part of an ONR-funded project for the [High Arctic Acoustic Tomography System \(HiAATS\)](#) and EU/NATO partners will also add gliders, ice station buoys and additional moorings to the monitoring network used in acoustic propagation modeling for Arctic naval applications.
- Quantum:** The [NPS Atomic Fountain](#) is nearing completion of its first phase by Physics professor Frank Narducci and U.S. Navy CDR Jens Berdahl, a doctoral student. The exceptionally precise instrument will be the largest of its kind in the world. **IMPACT:** Experimentation will open doors to a host of new defense application in quantum sensing concepts, namely for precision navigation and timekeeping in GPS-denied environments as well as detecting threats adversaries want to keep hidden.
- JIFX:** NPS hosted two quarterly Joint Interagency Field Experimentation (JIFX) events at Camp Roberts [5-9 Aug](#), and [4-8 Nov](#), bringing together more than 300 participants from across the DOD, NR&DE, industry, academia with NPS students/faculty. **IMPACT:** Supported by NavalX and OSD(R&E), the events enabled experimentation with cutting-edge technologies, and for the first time, Lake San Antonio is now open for testing with surface and underwater investigations thanks to a new partnership with Monterey County.
- Arctic:** NPS METOC students LCDR Colleen Wilmington and LCDR Taylor Hudson conducted their applied research in the Arctic operating environment to better understand the impact that a changing Arctic has on the Navy’s ASW and ISR missions. **IMPACT:** Primarily focused on underwater acoustics to enhance domain awareness and ability to detect and respond to threats, the data will refine NPS’ [Regional Arctic System Model \(RASM\)](#), an ice model with a six-month outlook – the only model that forecasts that far in advance.





INNOVATION – DELIVERING SOLUTIONS

- Wargaming:** NPS hosted a bilateral planning conference for the NWPAC '25 Wargame, with academic and industry partners, the U.S. Navy, Marine Corps, Coast Guard, Air Force, and Space Force, alongside counterparts from Japan's Maritime Staff Office, Self-Defense Fleet, Western Army, and Maritime Command and Staff College. IMPACT: Enhances NPS student education through real-world wargaming, while advancing interoperability, coordination, and integration of emerging technologies to [wargaming applications](#).
- Warfare Innovation Continuum:** During FY24, NPS students examined Integrated Naval Campaigning during the latest cycle of the NPS WIC, which supports the advancement of naval concepts and capabilities in the Naval Innovation Center operating process. IMPACT: The theme was requested by OPNAV N72, and the results were presented at the CNO's Futures Wargame, providing alternative force designs to their program. [Full Story](#). FY25 theme is [Non-Permissive Global Sea Control](#).
- C6F:** Under Project Kraken, 16 NPS students and 8 faculty advanced classified research solutions for Robotic Autonomous Systems (RAS) and innovative acquisition processes to strengthen Joint All Domain Operations for [NAVEUR/C6F's Task Force 66](#). IMPACT: Results include operational concepts, decision-quality analysis, [student theses](#), technology transition strategies and insights shaping future force design discussions. FY25 efforts will focus on standardization and scaling UxS integration for allied and coalition partners.
- Space Summit:** [Held in July at NPS](#), key leaders from the U.S. Navy, Marine Corps and Department of Defense gathered at NPS for the second annual Naval Space Summit. IMPACT: Advancing the state of the art in space-based capability is fundamental to advancing our maritime advantage. NPS alumnus VCNO Admiral James Kilby said, "This also requires a deep bench of talented naval leaders who understand the technologies and can develop new concepts of operations for how we fight – this is happening at NPS."
- GenAI:** Applying Lean Launchpad methodology, [NPS Defense Management](#) students developed a Generative AI solution that streamlines and delivers more efficient acquisition strategies. IMPACT: USMC Capt. Paul Carney, GySgt Alyssa Falge and LTJG Danielle Naldoza demonstrated their prototype solution to the Executive Director, PEO IWS who exclaimed it "an absolute game changer for leveling up their acquisition workforce" and is "looking forward to scaling the student's work and deploying it across the PEO." [Watch video](#).
- AI:** [NPS partnered with NVIDIA](#) on use of cutting-edge AI and simulation technologies to enhance education and research applications through their AI Technology Center Program. IMPACT: A foundational partner for the Naval Innovation Center at NPS, AI-based technologies will fuel advanced modeling and simulation applications. The first project will focus on 'Non-Physics Modeling and Scenario Generation' to create a tool for mission planning purposes specific to naval end-user domain requirements.
- SDREN:** NPS gained Authority to Operate the Secret Defense Research and Engineering Network (SDREN). IMPACT: SDREN is a key component of expanded classified research at NPS enabling NPS faculty and students access to create and collaborate in research areas such as Live Virtual Constructive (LVC) spaces. [Modeling Virtual Environments and Simulation](#) (MOVES) Institute, home to NPS' modeling/simulation research and master's and Ph.D. programs, will be a major beneficiary.

