



Photos from ANTX-Coastal Trident 2024

In the summer of 2025, the Naval Surface Warfare Center's Port Hueneme Division (NSWC PH) will lead execution of its Advanced Naval Technology Exercise. "ANTX-Coastal Trident 2025" will be conducted to support Naval Innovative Science and Engineering (NISE) research and accelerate identification, assessment, and implementation of leading-edge technologies to address gaps for the U.S. Navy and its interagency partners.

### WHAT IS ANTX?

ANTX is a resource that was developed for low barrier-to-entry technical demonstration and field experimentation by the Naval Research and Development Establishment (NR&DE), conducted to assist the naval and joint force in maintaining a competitive technical advantage.

The learning environments established during ANTX are intended to provide technologists with an understanding of the operational challenges faced by the warfighter and, complementing that, the warfighter with an understanding of developing and transitional technologies that might meet their needs. These events allow for collaboration among industry, academia, government research and development (R&D) organizations, and operational stakeholders. They also provide a testbed environment in which end users are able to assess the utility of technical innovations before decisions are made on investment and acquisition priorities.

The result is an acceleration of information exchange and reduction in risk for larger technology exercises, material transitions, future R&D, and a refined understanding of concepts of employment (CONEMP) and concepts of operation (CONOP).

### ANTX-COASTAL TRIDENT

NSWC PH's ANTX is encompassed within the architecture of an operational research program known as "Coastal Trident," which is conducted annually to examine capabilities of port and maritime security organizations to counter asymmetric threats to maritime forces, marine transportation and commerce, and critical port and maritime infrastructure.

ANTX-Coastal Trident is result of nineteen years of evolving collaboration between the Navy, the Port of Hueneme, interagency partners in port and maritime security, and technology subject matter experts (SME) in government, academia, and the private sector. The program has developed over this time to meet the needs of a wide variety of stakeholders, filling a unique niche in scenario-based assessment of capabilities representing key enablers and force multipliers.

In 2025, ANTX-Coastal Trident will be conducted to facilitate technical concept demonstrations and field experiments in the following priority areas:

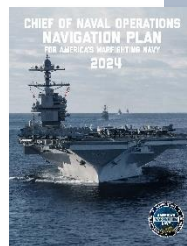
- Critical infrastructure security, threat mitigation, and incident response
- In-service engineering, maintenance, and sustainment of surface fleet and expeditionary combat systems
- Port and maritime domain awareness, data fusion, and decision support
- Augmented and virtual reality modeling, simulation, and digital engineering
- Unmanned systems applications, implementation, and countermeasures



"Our current system is too slow and too focused on acquiring systems not designed to address the most critical challenges we now face... the Department will instead reward rapid experimentation, acquisition, and fielding.

We will better align requirements, resourcing, and acquisition, and undertake a campaign of learning to identify the most promising concepts, incorporating emerging technologies in the commercial and military sectors for solving our key operational challenges."

- 2022 National Defense Strategy

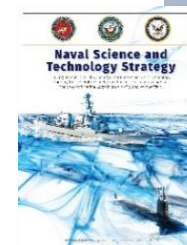


"Our adversaries are investing heavily in emerging technologies. In response, the Navy will adopt a more agile approach to experimentation and force modernization, leveraging partnerships with industry and academia.

We will promote a culture that embraces new concepts and prioritizes critical areas for investment, while also preparing to rapidly adapt—fast follow—in others.

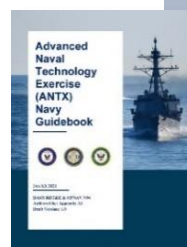
Working closely with allies and partners, we will expand our partnerships across the entire technology ecosystem. We will include Sailors early in the development process, listen to their ideas, and drive healthy feedback loops with the industrial and innovation base.."

- CNO Navigation Plan 2024



"Maritime warfare is unforgiving to those who lack agility and who do not adapt to new learning and technologies. Naval S&T must reduce warfighter risk by partnering earlier, experimenting more deliberately and ultimately scaling to put technology in their hands sooner ... We will better align our S&T approach to lower the barrier to collaborating and learn from the best of industry and academia."

- 2024 Naval Science and Technology Strategy



"Technologists need a better understanding of the operational challenges and context, and warfighters need a better understanding of what the technological innovations can do for them. To gain this interaction, innovative organizations across industry, academia and government need forums to allow for technical and operational exchanges.

ANTXs allow for this type of interaction without much of the bureaucratic restrictions that typically limit interaction, speed to fleet, or stifle good collaboration."

- ANTX Navy Guidebook (DRAFT, February 2021)



ANTX- Coastal Trident 2019

## ALIGNMENT OF ANTX WITH COASTAL TRIDENT

Coastal Trident was established in 2007 to meet the security training and exercise needs of the Port of Hueneme, as well as familiarize law enforcement and emergency response partners with the unique challenges associated with port and maritime operations.

Coastal Trident provides opportunities for operational stakeholders at the federal, state, and local levels of government to train and exercise in relevant and timely scenarios. In 2025, these organizations have communicated the following objectives:

- Exercise of maritime interdiction and hazardous device response capabilities
- Exercise of maritime homeland defense and mine countermeasures capabilities
- Exercise of port security and critical infrastructure protection capabilities
- Exercise of underwater search, recovery, and threat detection capabilities

ANTX-CT has been aligned with Coastal Trident since 2017, which provides access to scenario-based, operationally relevant test environments with representative end users not typically accessible to experimenters. Engagement in these venues maximizes feedback on CONOPS, CONEMP, operational effectiveness and suitability, and provides access to interagency partners that can expand awareness of technical solutions to a more diverse set of stakeholders.



Coastal Trident 2013

## ALIGNMENT OF ANTX WITH FATHOMWERX

The NavalX Ventura Tech Bridge was established at the “FATHOMWERX” facility at the Port of Hueneme in 2018 in order to connect, reinforce, and sustain an ecosystem that supports innovation, collaboration, and accelerates adoption of technologies through the engagement of innovators across academia, industry, and government.

FATHOMWERX stakeholders provide unique access and a prototyping, demonstration, and experimentation venue to small businesses and low-technology readiness level technologies targeting operational gaps and limitations. These stakeholders include:

- Naval Surface Warfare Center-Port Hueneme Division
- Naval Air Warfare Center-Weapons Division (Point Mugu and China Lake)
- Naval Facilities Engineering and Expeditionary Warfare Center
- Naval Undersea Warfare Center Detachment San Diego
- Port of Hueneme
- Economic Development Collaborative-Ventura County and Matter Labs

ANTX-CT has been aligned with FATHOMWERX since 2018, which expands access to technology developers and innovators that might not be engaged with the Navy through traditional development pathways. Engagement in this venue maximizes understanding of the local technology ecosystem and leverages the efforts of the Tech Bridge to scan, source, and curate developing solutions to operational needs.



ANTX-Coastal Trident 2018



Coastal Trident 2014

## PROGRAM SCOPE

ANTX-CT25 activities will be conducted as a combination of scenario-based technical demonstrations, field experiments, and discussion-and operations-based exercises. These activities will focus on the examination of capabilities proposed by public and private sector stakeholders to address operational gaps in a variety of focus areas.

Program activities will be designed to include elements of “experiment” and “exploratory exercise” activities, in which capabilities can be assessed qualitatively in the context of “what is possible?” and “will this work?” These activities will be intended to stop short of detailed technical evaluations and operations-focused “how would we?” questions, which typically require relatively mature capabilities and higher levels of operational integration.

ANTX-CT25 assessments will be intended to provide actionable information to the Navy on disruptive, enabling, and force multiplying technologies, as well as inform developers where their products have or have not held value in the context of the missions of the Navy and its interagency partners. This feedback loop is an opportunity to adapt, improve, or shift priorities for development of new technologies to better meet the needs communicated by operational stakeholders and their program representatives.



ANTX-Coastal Trident 2019



ANTX-Coastal Trident 2022

## PROGRAM OUTCOMES

ANTX is intended to support the NR&DE in its ultimate goal – the timely delivery of relevant and suitable capabilities to the naval warfighter.

ANTX-Coastal Trident builds upon this goal by including interagency partners in port and maritime security to address the wide variety of asymmetric threats holding Navy forces at risk. Its contribution to the NR&DE is to establish a venue to accelerate knowledge associated with technological enablers and force multipliers of needed capabilities. Accordingly, the program culminates with an opportunity for the Navy to smartly progress, invest, or divest from the capabilities demonstrated.

While program activities will vary in their efforts to engage with end users in the field, evaluate performance, and collect technical data, each project was conducted with the objective of providing an observed, or “qualitative,” assessment of the technical concepts demonstrated.

At the conclusion of ANTX-CT25 activities, project outcomes will be assessed for “high-value opportunities.” SME assessments, project team self-assessments and after action reports (AAR), as well as written and verbal feedback by operational stakeholders will be compiled and projects highlighted according to their ability to meet near-term technical needs serving as leading edge enablers or force multipliers.

High-value opportunities will be identified, based on these observations and assessments of project activities, with the objective of facilitating progress in one of the following potential engagement areas:

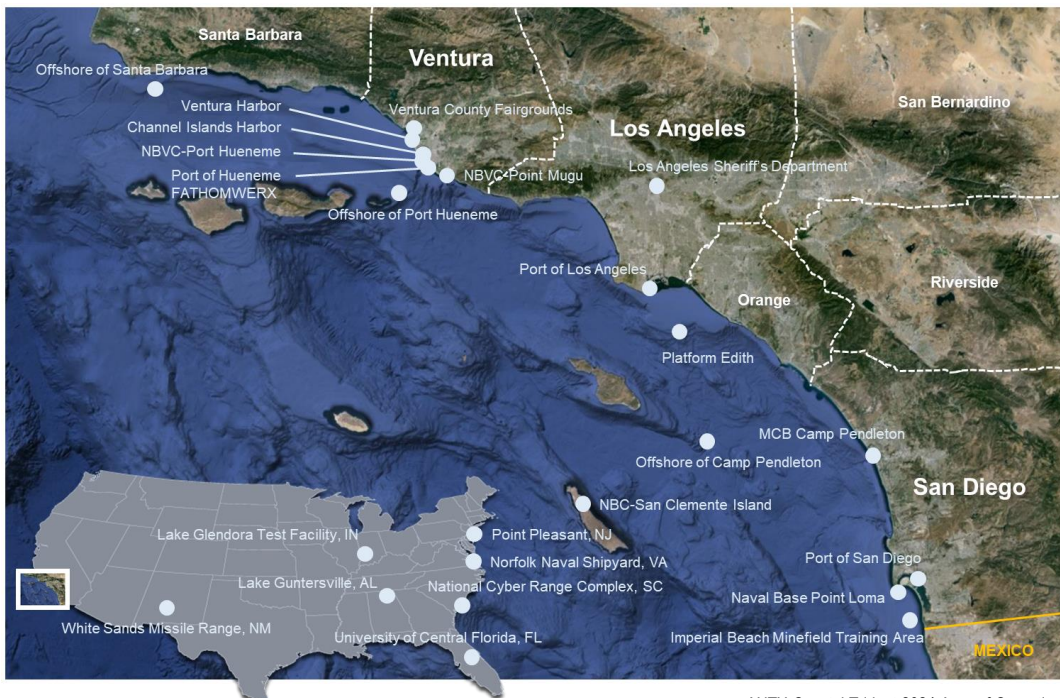
- Conduct a disruptive opportunity exploration (e.g., technology prize challenge)
- Participate in a more formal fleet experiment or exercise (e.g., Trident Warrior)
- Transition into a collaborative S&T project (e.g., CRADA or EPA)
- Transition into a new NR&DE maturation project (e.g., Warfare Center “Mega-project”)
- Transition into program of record or fleet inventory (e.g., contract or OTA procurement)

Some projects will not warrant recommendations to these transition pathways and will thus not be identified as high-value opportunities. It is expected that ANTX stakeholders will either recommend these project re-engage with follow-on demonstrations, field experiments, align with another field experimentation program, or divest of these proposals.

## PROGRAM VENUES

ANTX-Coastal Trident planners leverage relationships established over two decades of planning and executing operational research programs to access land-based test ranges, sea test ranges, ports and water front facilities, offshore facilities, specialized laboratories, and support vessels throughout Southern California and other regions across the United States. These venues enable the planning team to design diverse, realistic, and challenging scenarios in which participants can increase proficiency in port and maritime security operations, demonstrate and assess technical and operational capabilities, identify high-value opportunities, and set priorities for improvement.

A modular construction, where venues and supporting resources match project needs and when technical readiness matches venue availability, permits the planning team to stretch the art-of-the-possible in operating locations. In 2024, ANTX Coastal Trident was conducted in 32 different venues, spanning 200 coastal miles in Southern California and extending offshore into international waters, as well as remote facilities in seven states.



ANTX-Coastal Trident 2024 Area of Operations



Naval Base Ventura County (NBVC), CA



Platform Edith offshore of San Pedro, CA



Lake Glendora Test Facility in Sullivan, IN

## ADDITIONAL PROGRAM INFORMATION

### How will ANTX-CT25 be conducted?

ANTX-CT25 will be conducted as a series of technical demonstration, field experimentation, and exercise activities, according to the unique objectives and operational, administrative, and support needs of each project.

The ANTX-Coastal Trident program incorporates a modular design that serves to align resources, control interactions between program elements, and minimize artificiality in exercise architecture. This modularity is intended to limit technical and operational risk, addressing the potential that delays in technical readiness or withdrawals associated with one activity might impact successful execution of the program. It also allows for participants with differing priorities, operational proficiency, or technical maturity to concurrently utilize program resources and learning environments.

Under this modular construct, projects are aligned administratively where there is a common focus. This alignment assists the planning team in coordinating reviews, approvals, documentation, and communicating program scope.

Operationally, however, ANTX-Coastal Trident projects break from the administrative construct, with the planning team “plugging-and-playing” activities where participating organizations, operational scenarios, and supporting resources are common. Projects might also be separated in time and place to establish a more focused training environment, assure information (INFOSEC) or operational security (OPSEC), or facilitate experimentation that allows technologies to be pushed to failure without risk to other participants.

### Where and when will ANTX-CT25 be conducted?

ANTX-CT25 activities will be conducted where venues and supporting resources match project needs and when technical readiness matches venue availability. For these reasons, there will not be specific locations and dates for execution identified until later in the planning process.

Planning milestones, however, have been established by the planning team:

- Concept Development Meeting ... November 13, 2024
- Project Proposals Due ... January 8, 2025
- Initial Planning Meeting ... January 15, 2025
- Mid-term Planning Meeting ... March 12, 2025
- Final Planning Meeting ... May 14, 2025
- Project Execution ... June through September 2025

### Why should I participate in ANTX-CT25?

ANTX-CT25 assessments are intended to provide actionable information to the Navy on promising technologies, as well as inform developers where their products have or have not held value in the context of the missions of the Navy and its interagency partners.

The diverse environments for technical demonstration and experimentation provided through ANTX offer distinct benefits for stakeholders and participants:

- **Fleet and Interagency Partners** – Obtain “hands-on” or “over-the-shoulder” exposure to developing technical solutions, a voice in the value and suitability of new technologies, and an opportunity to explore new tactics and operational concepts enabled by emerging technologies.
- **Warfare Centers and Government Labs** – Collaborate with industry and inform technical development, gain insight into warfighter and end user needs, and obtain early access to industry and academic research to facilitate technology transfer and transition.
- **Program Offices and Resource Sponsors** – Assess novel concepts and technical applications, allowing for a preliminary “test drive” of potential solutions to near-term needs and a venue to inform and prioritize technical investment.
- **Industry and Academia** – Gain unfiltered exposure and visibility with end users and program representatives. A low-risk, consequence-free learning environment allows for direct feedback, representing a unique opportunity to align development efforts with communicated needs.

## POINTS OF CONTACT

ANTX-Coastal Trident activities are planned and conducted by NSWC Port Hueneme’s Office of Technology, in partnership with the Port of Hueneme and FATHOMWERX.



For additional information about the program, please contact the ANTX-CT25 Principal Investigator:

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For information about FATHOMWERX capabilities and technical engagement, please contact our partners at Matter Labs:

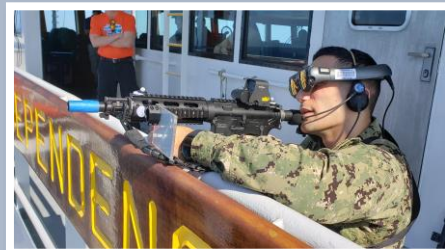
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ANTX-Coastal Trident 2020



ANTX-Coastal Trident 2019