



NAV  AIR RANGES  
Leaders in providing decision-quality data

## *Directed Energy T&E at Weapons Division*



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06 Aug 2009

# *Take - Aways*

- **NAVAIR operates full-service, highly instrumented ranges in realistic environments**
- **Customers are supported from all of the Services, many Agencies & beyond ...**
- **Risks are managed for a broad array of high hazard testing & training events**
- **Land & Sea Ranges have the experience & unique resources for HEL & HPM T&E**

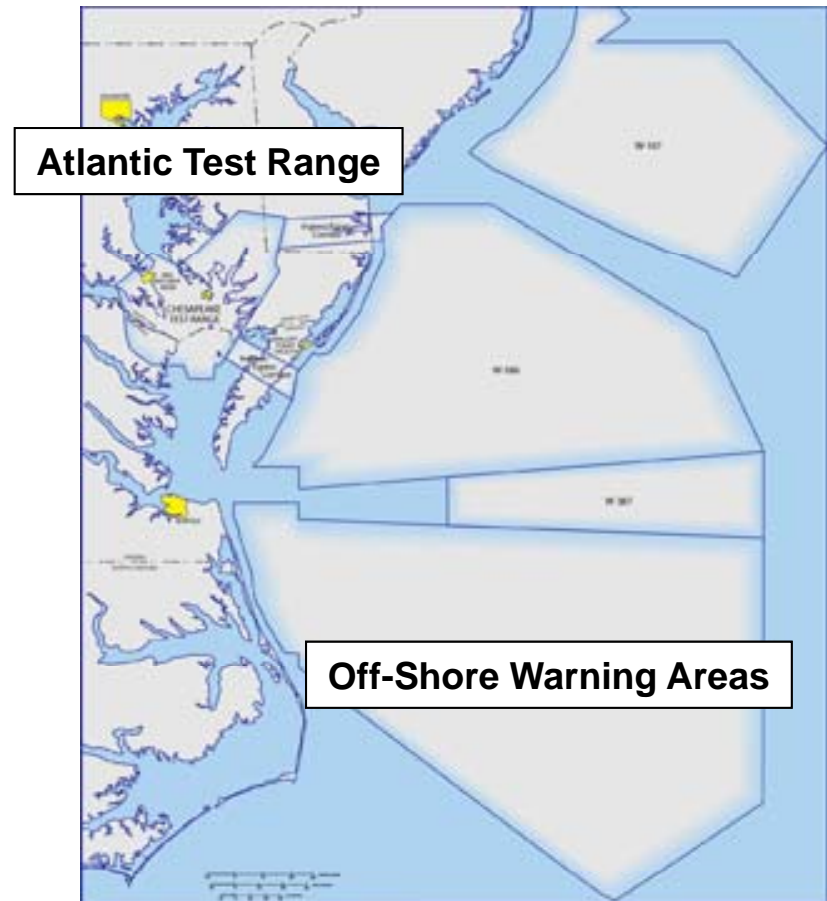
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# NAVAIR Ranges

## Weapons Division



## Aircraft Division



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# *Weapons Division Mission Support*



## **Surface-to-Surface**

Land attack: launch occurs on the Sea Range with impact at SCI, China Lake, or further inland



## **Satellite and Strategic Missile Launch Support**



## **Surface-to-Air**



## **Air-to-Air**



## **Air-to-Surface**



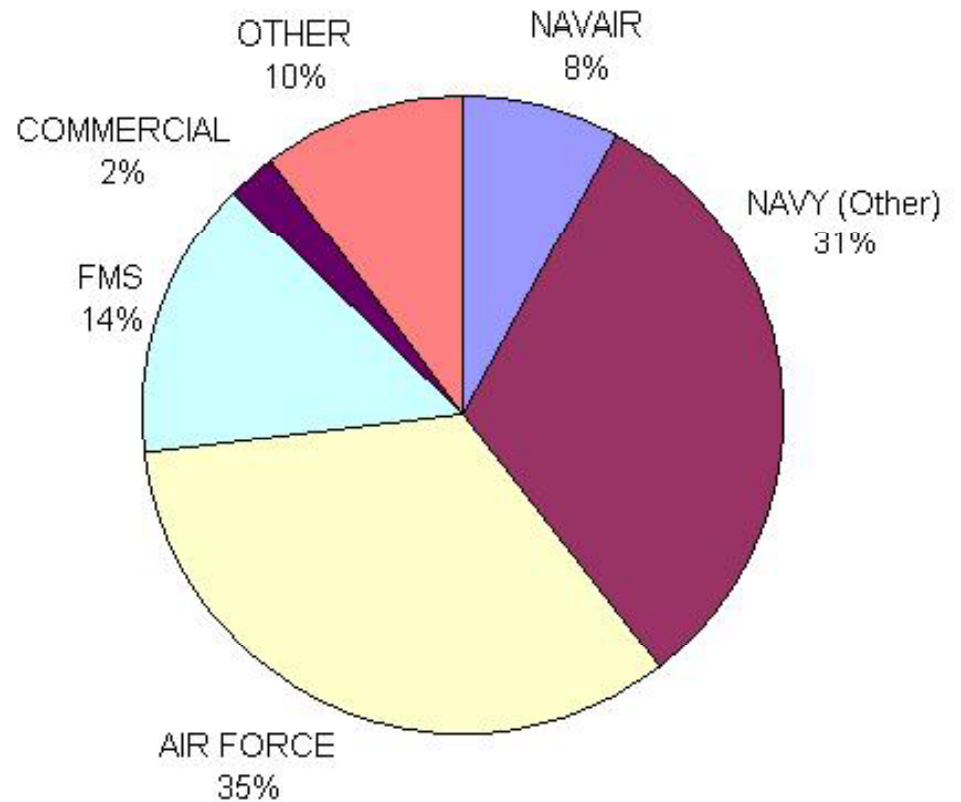
## **Electronic Warfare**



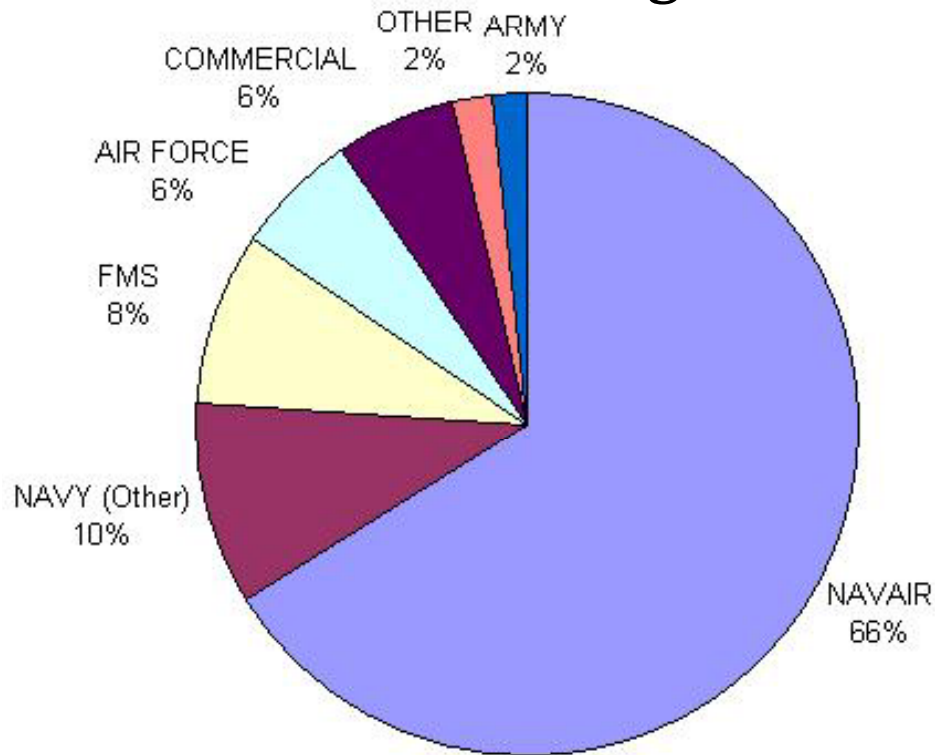
## **DE Weapons**

# We have a diverse customer base ...

## Sea Range



## Land Range\*



## Customer Base (FY07)

\* Does not include the Electronic Combat Range

# *Land Range Complex, China Lake*

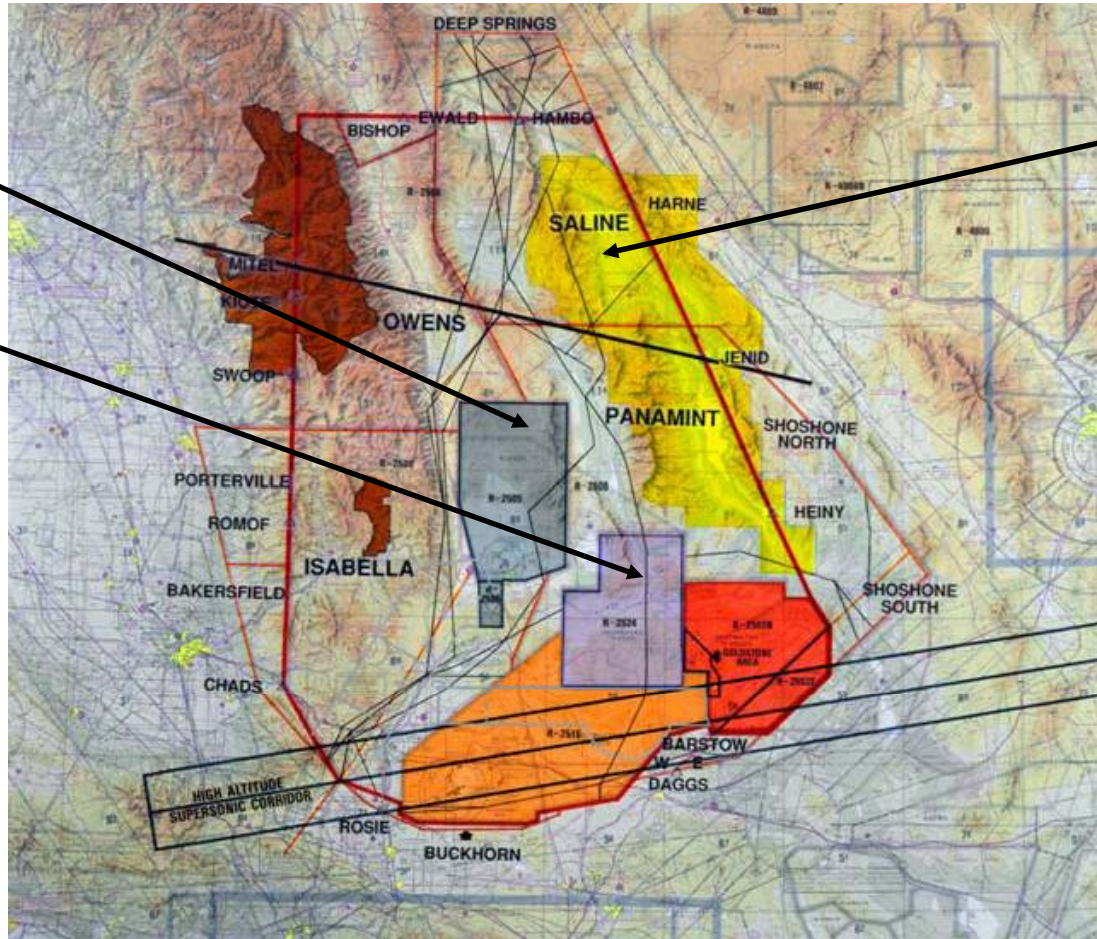


- Realistic air, land & electronic operational environment
- 1,722 sq mi of land space
- 20,000 sq mi of controlled airspace
- Comprehensive instrumentation set includes TSPI, telemetry, optical, communications, ...
- Air, land, & ARM targets
- Ordnance storage, handling, and assembly facilities
- Range safety, security, and environmental support
- Two major EOD groups for IED RDT&E support and training
- Proximity to Ft. Irwin, 29 Palms, Nellis AFB

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# Airspace Control - R2508

**Secured  
airspace  
in R-2505  
and  
R-2524  
from  
ground  
level  
up**



**Restricted  
airspace in  
R-2508  
from 20K ft  
and up**

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## *Land Range Role*

- **Weapons & weapons system RDT&E**
- **Have tested most of the U.S. air-to-air & air-to-ground tactical weapon systems & many from our Allies**
- **Heavily involved in air vehicle mission systems testing** (e.g., testing associated with the F-18 weapons sys S/W support lab)
- **Also test ground-launched systems including guns, artillery, & missiles**
- **Accomplish component level testing: rocket motors, fuzes, sensors, & warheads**



# *DE Testing at Land Range*

- **Environmental documentation is in place to support HEL & HPM testing**
- **HPM Experience**
  - **RF weapon survivability testing for OSD Live Fire T&E Office**
  - **Non-lethal HPM**
  - **Commercial infrastructure RF susceptibility testing**
  - **Counter IED Interoperability/Compatibility test site**
- **HEL Experience**
  - **Airborne Laser Lab & high energy laser damage effects testing**
  - **Demonstrated above-horizon laser engagement capability**

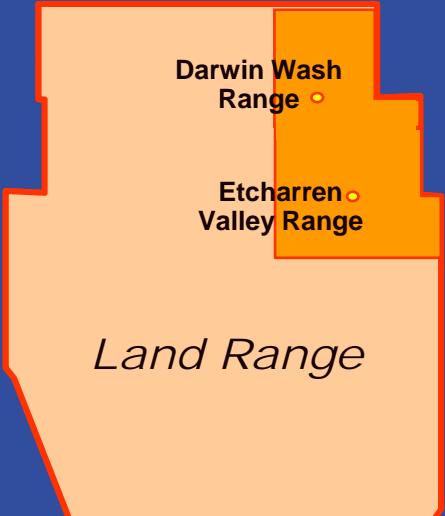
**Darwin Wash**  
Explosive-driven HPM T&E &  
Combat Mobility & Small Unit  
Tactics Training Range



*Land Range  
Complex  
DE T&E  
Venues*



**Etcharren Valley Range**  
High Power Microwave, GPS Anti-  
Jamming/Jamming, & Radar  
Cross Section T&E



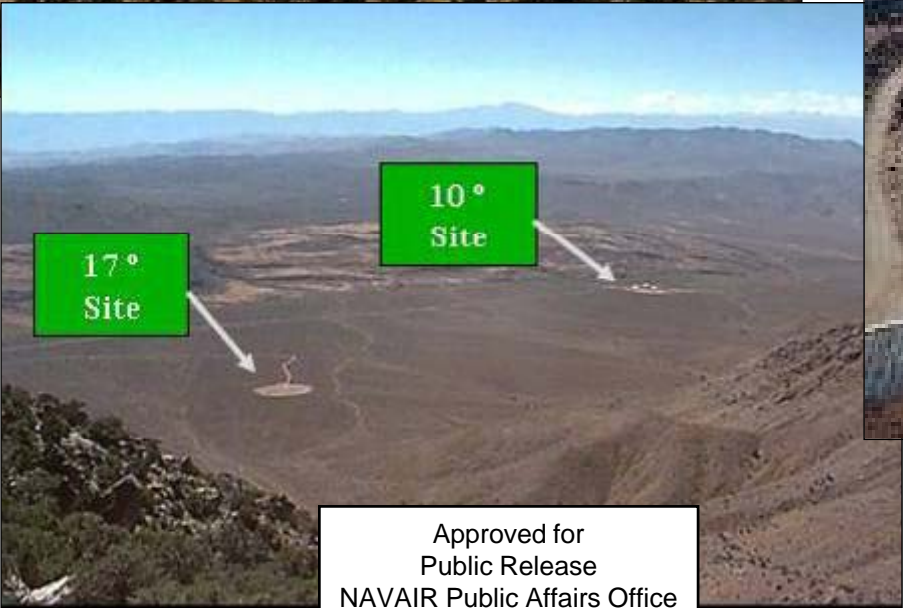
**Land Range**  
Aircraft Systems  
Integration, UAS,  
Kinetic Weapons,  
Laser T&E



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**Look Down Facility at over 8200 MSL**

*North 40*



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**Target Facilities at 5400 MSL**



# Sea Range, Point Mugu



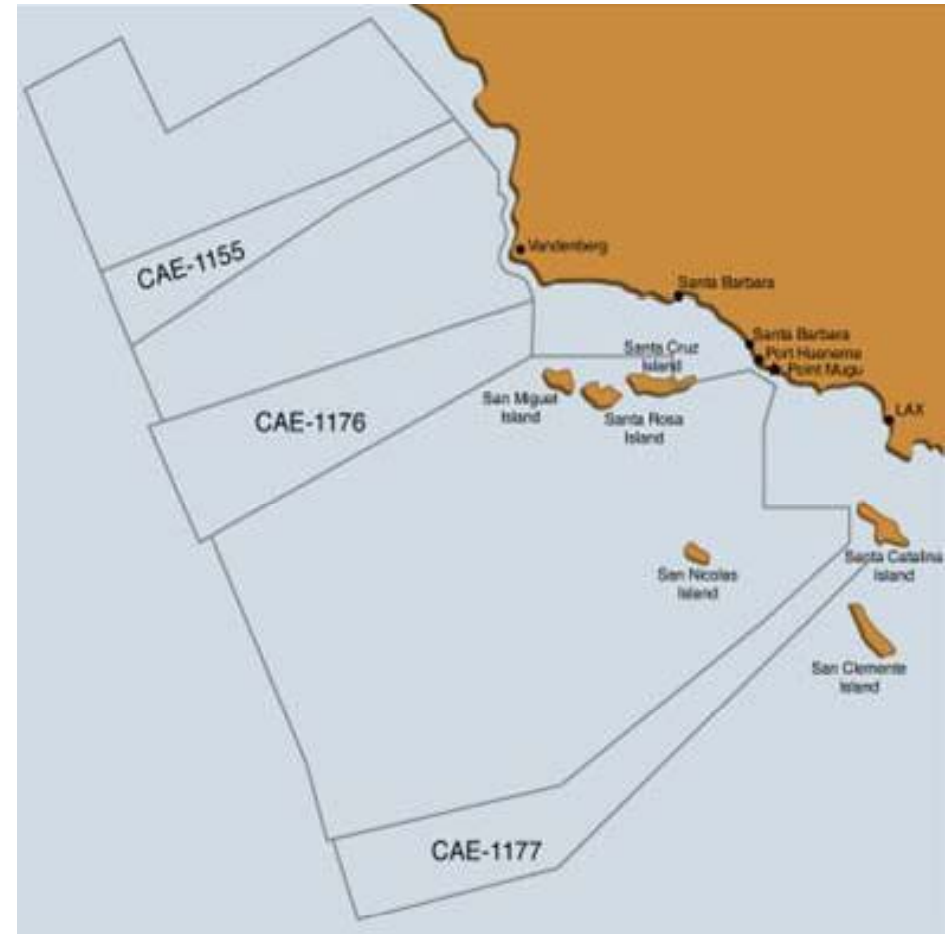
- Realistic maritime operational environment
- 36,000 sq mi of controlled sea / airspace
- Over 220,000 sq mi instrumented sea & airspace
  - TSPI, telemetry, communications, geophysics ...
- Operations & range control
- Data processing & display system
- Air, sea, littoral targets
- Ordnance storage, handling, and assembly facilities
- Range safety, security, & environmental support
- Aircraft support
- Adjacent to Port Hueneme & NAVSEA Self Defense Test Ship

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# Airspace Control

- **NAVAIR WD is scheduling authority for Sea Range airspace, including Restricted Airspace over SNI**
- **Can close CAE-1177 for continuous air & sea operations between Sea Range and SCORE Range**



An aerial photograph of the United States, showing the coastline and inland terrain. Overlaid on the map are several colored lines representing operational areas: a blue rectangle in the Pacific, a yellow rectangle extending from the coast, a purple area near the coast, and a red area further inland. The text 'Sea Range operational footprint expands to meet program needs' is written in white, italicized font across the top left. The text 'Demonstrated Operational Areas' is written in white, italicized font in the bottom left. A white box with black text is in the bottom left, and the NAVAIR RANGES logo is in the bottom right.

*Sea Range operational footprint expands to meet program needs*

*Demonstrated Operational Areas*

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# *San Nicolas Island*

*"Cornerstone of the Sea Range"*



- Under Navy ownership since 1933
- 3.6 miles wide X 9 miles long
- Highest point = 907 ft
- 65 miles from Pt Mugu, 85 miles from L.A.
- 10,000 foot airfield with daily passenger & logistics flights
- High Bandwidth fiber optic comm to Pt Mugu & other DoD ranges



- Secure facility / hanger
- Inert impact area
- Beach landing areas
- Nearing completion of an Environmental Assessment for conducting HEL ops
- SNI can be used as a backstop for laser energy



# *Sea Range Role*

- **Support the T&E of a wide variety of weapons, ships, aircraft & specialized systems for a broad spectrum of military, Homeland Defense, NASA, foreign Allies, & private sector programs**
- **Almost every weapon system in the Navy's inventory has been tested or used at the Sea Range, including those launched from aircraft, surface vessels, & submarines**
- **Coordinated air, surface, & submarine operations including carrier strike group exercises**
- **Long-range, large hazard pattern weapons T&E & experimental vehicle testing**
- **Support ICBM, missile defense, & Polar-orbit satellite launches**
- **Multi-service, multinational T&E & training exercises**

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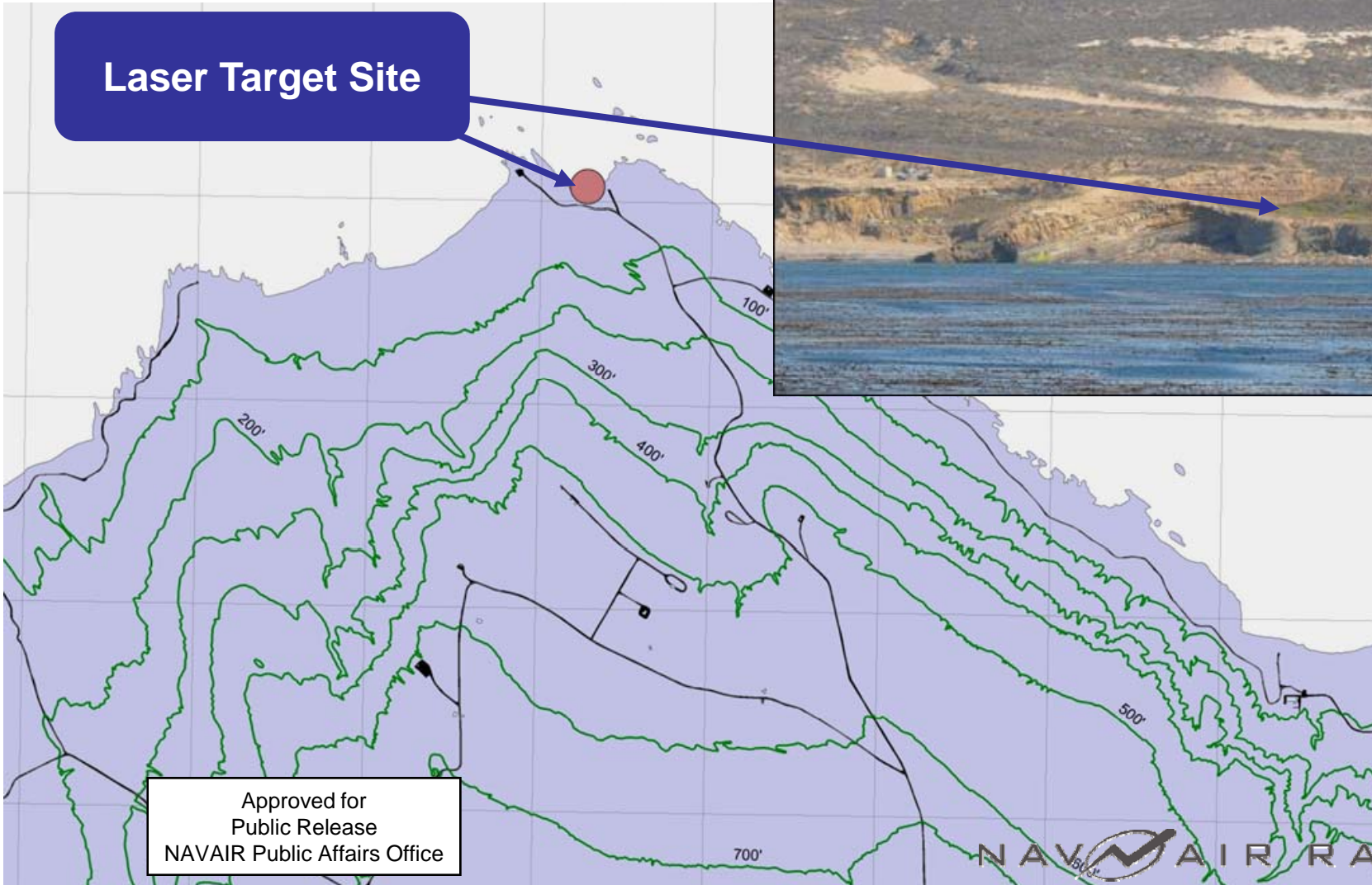
# *DE Testing at Sea Range*

- **An Environmental Assessment is nearing completion that will permit laser testing/training in general**
  - Will be able to execute a wide variety of events, including surface-to-surface, surface-to-air, air-to-air, & air-to-surface
  - Broad range of wavelengths, & power levels to 1 mega watt, supported
- **Airborne Laser is testing under their own EIS, including target launches from San Nicolas Island**
- **What's unique?**
  - Maritime/Littoral environment
  - Ability to use San Nicolas Island, as a test venue & as a backstop for laser energy to help mitigate safety issues
  - NAVSEA's Self Defense Test Ship (SDTS) can host laser systems & can provide an at-sea, remotely controlled, T&E platform for the conduct of advanced self defense combat systems & weapons evaluation without risk to personnel

# *SNI Altitude Contours*



**Laser Target Site**

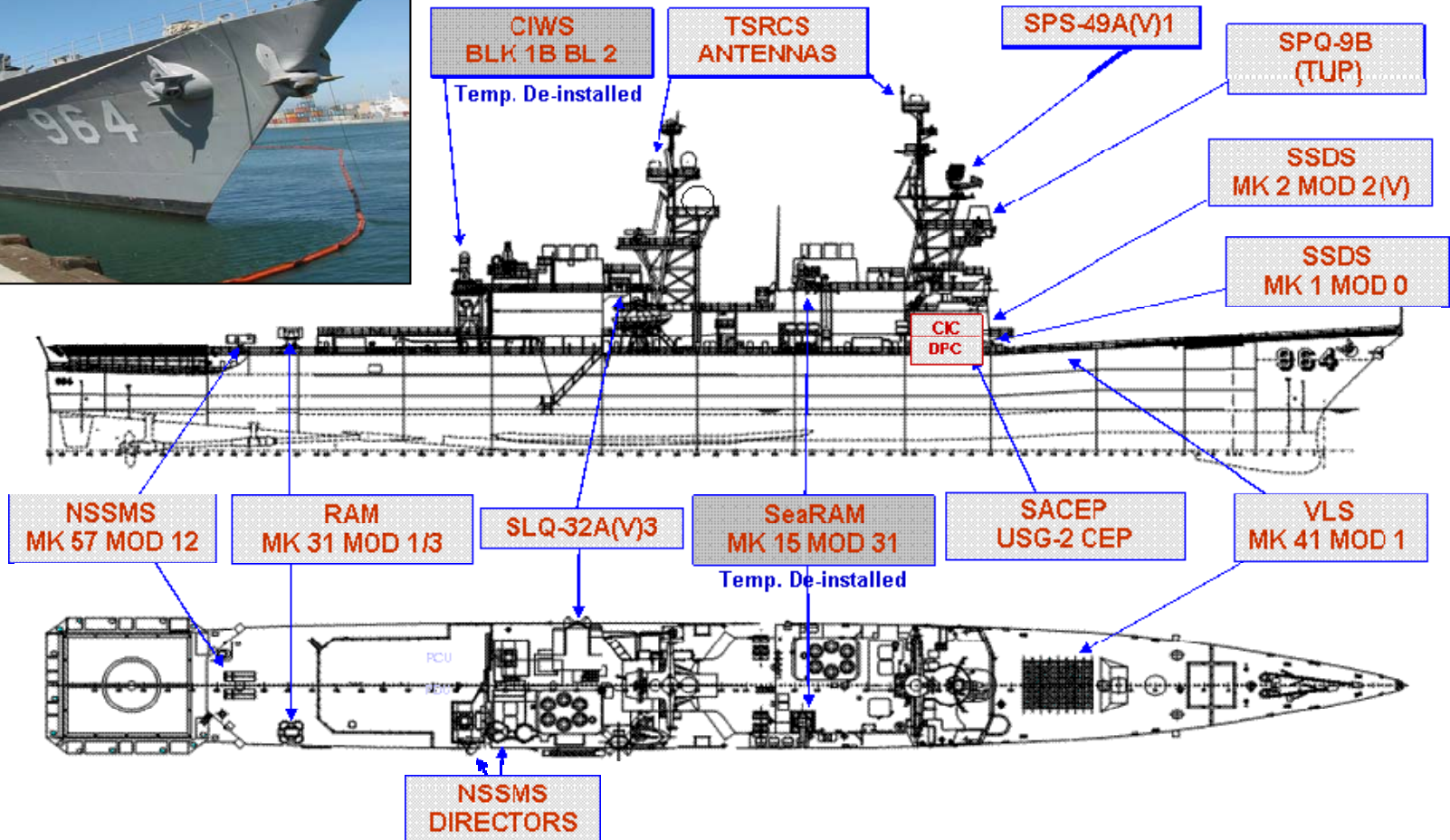


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# Self Defense Test Ship



Formerly the  
**USS PAUL F. FOSTER**  
(DDH 964)





# *Self Defense Test Ship*



- **Ample shipboard real estate**
- **Manned or unmanned operations at-sea and/or in-port operations**
- **Speed: Capable of 33 Knots (typically < 15 Knots to conserve fuel)**
- **Sea State: No Limits**
- **Electric Power**
  - 8,000kW/440V/60Hz
  - 450kW/440V/400Hz
- **Chilled Water**
  - Three Chilled Water Plants x 500 GPM
- **Ordnance handling & storage, Secure operations**
- **At-Sea passenger embarkation/disembarkation**
- **Berthing/messing/laundry, 100 ship-riders (34 crew)**



# *Environmental Stewardship*



- 1.1 million acres
- 4,500 acres of coastline and wetlands
- 650 species of plants
- 340 species of animals
- 40 species of marine mammals
- Coso Rock Art National Historic Landmark
- San Nicolas Island historic sites
- Point Mugu lagoon and estuary



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