

NAWCWD Quick Facts

China Lake and Point Mugu, California (October 2015)



Naval Air Warfare Center Weapons Division (NAWCWD) • Center for Weapons and Armaments Technology Supporting Naval Aviation and Warfighter Requirements Since 1943 Providing Our Warfighters the Decisive Advantage

www.navair.navy.mil/navcwwd

Mission. To execute full-spectrum weapons and warfare systems research, development, acquisition, test, and evaluation (RDAT&E)

Vision. Provide innovative, integrated, and dominant warfighting effects for our naval, joint, and coalition forces

What We Do. Research & engineering, test & evaluation, weapons & weapon systems, weapons platform integration, system-of-systems integration, electronic warfare, energetics, survivability/vulnerability/lethality, modeling & simulation

Direct Fleet Support. Warfighter Response Center provides 24/7 access to subject matter experts, EW help desk, air launched weapons team, seaborne swarming threat, weapon system support activity, weapons readiness reviews, conventional ordnance deficiency reports, engineering investigations, mission planning systems, depot-level weapons support

- World leader in guided missiles, advanced weapons and systems, complex software integration on tactical aircraft, energetic materials, and subsystems
- Integrate weapons: AV-8B, EA-6B, EA-18G, F/A-18A-F, EP-3E, Joint Strike Fighter (JSF), Unmanned Systems (UGV, ScanEagle, Firescout), F-22, Helicopters (AH1, AH-1W, AH-1Z, UH-1Y), ships & submarines
- Operate the Navy's west coast Land and Sea Ranges
- Counter-Improvised Explosive Device (C-IED) technology

Scope of Operations (Fiscal Year 2015 Actual)

Annual Funding. Total Obligational Authority \$2.42 billion
Contracts. Labor, supplies, services \$825+ million
Personnel. Civil Service: 5,189 Military: 184
Contractors. 1,585 Total: 6,958

Intellectual Capital — Maintaining Technological Edge
Science and Eng. Professionals: 2,470 (48% of workforce)
PhDs: 131 **Masters:** 933 **BA / BS:** 2,239

Annual Test Events. 2,000+

Developmental Testing — Naval Test Wing Pacific

- VX-31 (China Lake) • VX-30 (Point Mugu)

Operational Testing

- VX-9 • Marine Aviation Detachment

Facilities and Ranges

Navy Region Southwest

China Lake. 150 miles NE of Los Angeles (desert)

Point Mugu. 50 miles N of Los Angeles (coast)

Land Ranges. 1.1 million acres (Navy's largest single landholding, 85% of Navy RDT&E lands, 52% of Navy lands worldwide)

Sea Range. 36,000 – 220,000 square miles

Air Complex. R-2508 includes 20,000 square miles, 12% of California's total airspace

Plant replacement value: \$3+ billion

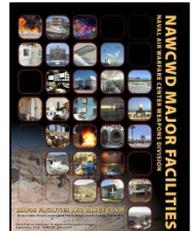
- 3 Airfields. 2 UAS strips. Buildings and facilities: 2,000+
- Unique world class facilities and ranges
- Optimal test environment — 350+ clear days per year

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Facilities and Ranges (Continued). Geographic diversity (vast ocean, deep water ports, islands, mountains, deserts, canyons, and forests) all within restricted air and land space

Major Facility and Range Guide. For details on WD's 36 major facilities, see the new 91-page book with hundreds of photographs. Includes equipment & facility descriptions, RDT&E work, mission, combat support, and scope of operations (Ad Pub 191). Also available in PDF format on the WD Public Website.



Direct Conflict Involvement (Examples)

NAWCWD has had a significant role in every U.S. military crisis beginning with World War II. Operation Iraqi Freedom quick-response topics: CH-53E, Cobra Dos, Low Collateral Damage Bomb, Electronic Warfare Database Support, GBU-24E/B Laser Guided Bomb, Improvised Explosive Devices, Countermeasures, Intrepid Tiger Pod, Jammer Technique Optimization, Joint Direct Attack Munition, Man Portable Air Defense Systems, MH-60R, Precision Strike Suite for Special Operations Forces, P-3C search capability, Rapid Attack Information Dissemination and Execution Relay, Shared Reconnaissance Pod. New technologies are now being developed for the ongoing war on terror.

Weapons (Examples)

Advanced Anti-Radiation Guided Missile, Advanced Medium-Range Air-to-Air Missile, Advanced Precision Kill Weapon System, Bombs, Evolved SeaSparrow Missile, Free-Fall Weapons, Harpoon, Hellfire, High-speed Anti-Radiation Missile, Joint Direct Attack Munition, Joint Standoff Weapon, Laser-Guided Bombs, Low-Cost Guided Imaging Rocket, Miniature Munitions, Rolling Airframe Missile, Sidewinder, Sparrow, Standard Missile, Standoff Land Attack Missile-Expanded Response, Tomahawk, Trident

Programs/Projects/Systems (Examples)

Active Electronic Scanned Array, Airborne Early Warning Ground Integration System, Airborne Laser Test Bed Automatic Radar Periscope Detection and Discrimination, Distributed Ground-Based Threat Detection System, EW Systems, Joint Helmet-Mounted Cueing System, Hercules Airborne Weapons Kit (HAWK) Tool, High-speed Weapons, Infrared and Electronic Countermeasures, Link-16, LITENING Pod, Multifunctional Information Distribution System, National Aeronautics and Space Administration (NASA) Parachute Development Verification Strike Accelerator, Tactical Aircraft EW, TIGER Pod



China Lake Land Ranges and Point Mugu Sea Range



China Lake Land Ranges: 1.1 million acres — larger than the state of Rhode Island • R-2508 airspace — 20,000 square miles
Point Mugu Sea Range: 36,000 – 220,000 square miles • World's largest instrumented over-water range

Latest Technologies

Unmanned Systems (UxS). UxS work is a top-four strategic thrust area. NAWCWD conducts RDAT&E on 25+ systems and is a technical lead for platforms, payloads/sensors, and control systems. Current programs engaged in the ongoing war on terror include Shadow, Small Tactical Unmanned Aircraft System (STUAS), Fire Scout, and Scan Eagle.



Innovative Weapons and Systems (Examples)

Spike. Small, 5-pound, accurate, inexpensive shoulder- or platform-launched guided missile. Perfect standoff precision engagement weapon with minimal collateral effect.

Low-cost Guided Imaging Rocket (LOGIR). A low-cost, precision-accuracy enhancement kit for rockets, able to hit large numbers of small moving targets in a single sortie quickly with reduced pilot exposure.

Thermobaric Hellfire. Metal augmented charge (MAC) warhead is highly effective against enemies in caves, bunkers and hardened multi-room complexes. Developed and fielded in the Hellfire AGM-114N missile, MAC has been a huge success with our warfighters.

Distributed Ground-Sensor-Grid Threat Detection System
Automated missile warning system designed to provide reliable, timely, and accurate missile location information of shoulder-launched surface-to-air missiles (SAMs).

Low Collateral Damage Bomb. Highly effective precision-guided capability that minimizes collateral damage in urban environments.

Directed Energy Weapons. Conducting R&D of high-energy laser (HEL) technology.

Automatic Radar Periscope Detection and Discrimination. Significant maritime radar upgrade allows ships to spot tiny enemy periscopes even in very rough seas.

NASA / Jet Propulsion Lab (JPL). Working with NASA on the recovery parachutes and splashdown coverage for the launch of Orion Multi-Purpose Crew Vehicle. Also working with JPL on the Supersonic Inflatable Aerodynamic Decelerator and parachutes for Mars Lander.



Private Industry & Academia. Patents with high commercial use potential: chinalaketechnologies.org/techlicensing.html

- **Total NAWCWD Patents Awarded:** 1,700+
NAWCWD applies for an average of 60 patents per year.
- **Past Technology Transfer.** CL-20 (most significant energetic material in 50 years) • Auto air-bag sensors • Ultrasonic scanning • Stop-action video • Chemiluminescent light sticks • Continuous emissions monitor • Weather modification, etc.

New Patents for Licensing. Fingerprint detection, facial recognition software, explosives and drug detection, cell phone / computer battery enhancement, solar cell improvement, and small target detection



Renewable Energy

Biofuels. Developed the technology to produce high quality, full performance, commercially viable jet fuels from organic waste materials and other renewable resources. Technologies address the Secretary of the Navy's initiative to reduce the Navy's dependence on foreign petroleum.

Second Largest DoD Photovoltaic (PV) Plant. China Lake installed a 118-acre solar array. It is expected to generate 14 megawatts of electricity annually, saving \$13M.

Coso Geothermal Project. Produces enough electricity to power 219,000 homes.

Weapons Evolution Historical Accomplishments

China Lake. Established in 1943 to test rockets developed by the California Institute of Technology.

Point Mugu. Established in 1946 as the Navy's first instrumented missile test Sea Range.

NAWCWD Firsts. Historically recognized for numerous "firsts" in weapons, EW, technology, space, and undersea work.

Internationally Recognized as Historic Aerospace Sites. China Lake and Point Mugu have received the prestigious aerospace designation by the American Institute of Aeronautics and Astronautics (AIAA).

Arming the Fleet (ATF). For details on NAWCWD successes from 1943 until today, see ATF, a 208-page book with hundreds of photographs, completely indexed for easy research. Available via national booksellers and locally at the Naval Museum of Armament and Technology. Also available in PDF format on the NAWCWD Public Website.

