# Final
# Environmental Impact Statement/Overseas Environmental Impact Statement
# Atlantic Fleet Training and Testing

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# 2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The United States (U.S.) Department of the Navy (Navy) proposes to conduct training activities (hereinafter referred to as "training") and research, development, testing, and evaluation (hereinafter referred to as "testing") activities in the Atlantic Fleet Training and Testing (AFTT) Study Area, as represented in Figure 2.1-1. When discussed together, training and testing are also referred to as "military readiness activities." These military readiness activities include the use of active sonar and explosives within existing range complexes and testing ranges, in high seas areas located in the Atlantic Ocean along the eastern coast of North America, in portions of the Caribbean Sea and the Gulf of Mexico, at Navy pierside locations, within port transit channels, near civilian ports, and in bays, harbors, and inshore waterways (e.g., lower Chesapeake Bay). These military readiness activities are generally consistent with those analyzed in the AFTT Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) completed in August 2013 and are representative of training and testing that the Navy has been conducting in the AFTT Study Area for decades.

In this chapter, the Navy builds upon the purpose and need to train and test by describing the Study Area and identifying the primary mission areas under which these military readiness activities are conducted. Each warfare community, e.g., aviation, surface, submarine, expeditionary, conducts activities that contribute to the success of a primary mission area (described in Section 2.2, Primary Mission Areas). Each primary mission area requires unique skills, sensors, weapons, and technologies to accomplish the mission. For example, under the anti-submarine warfare primary mission area, surface, submarine, and aviation warfare communities each utilize different skills, sensors, and weapons to locate, track, and eliminate submarine threats. The testing community contributes to the success of anti-submarine warfare by anticipating and identifying technologies and systems that respond to the needs of the warfare communities. As each warfare community develops its basic skills and integrates them into combined units and strike groups, the problems of communication, coordination and planning, movement, and positioning of naval forces and targeting/delivery of weapons become increasingly complex. This complexity creates a need for coordinated training and testing between the fleets and systems commands.

This chapter describes the training and testing activities, which compose the Proposed Action, necessary to meet military readiness requirements. These activities are then analyzed for their potential effects on the environment in the following chapters of this EIS/OEIS. For further details regarding specific training and testing activities, please see Appendix A (Navy Activity Descriptions). In accordance with the Marine Mammal Protection Act (MMPA), the Navy plans to submit to the National Marine Fisheries Service (NMFS) an application requesting authorization for the take of marine mammals incidental to training and testing activities described in this EIS/OEIS. NMFS's proposed action will be a direct outcome of responding to the Navy's request for an incidental take authorization pursuant to the MMPA.

## 2.1 DESCRIPTION OF THE ATLANTIC FLEET TRAINING AND TESTING STUDY AREA

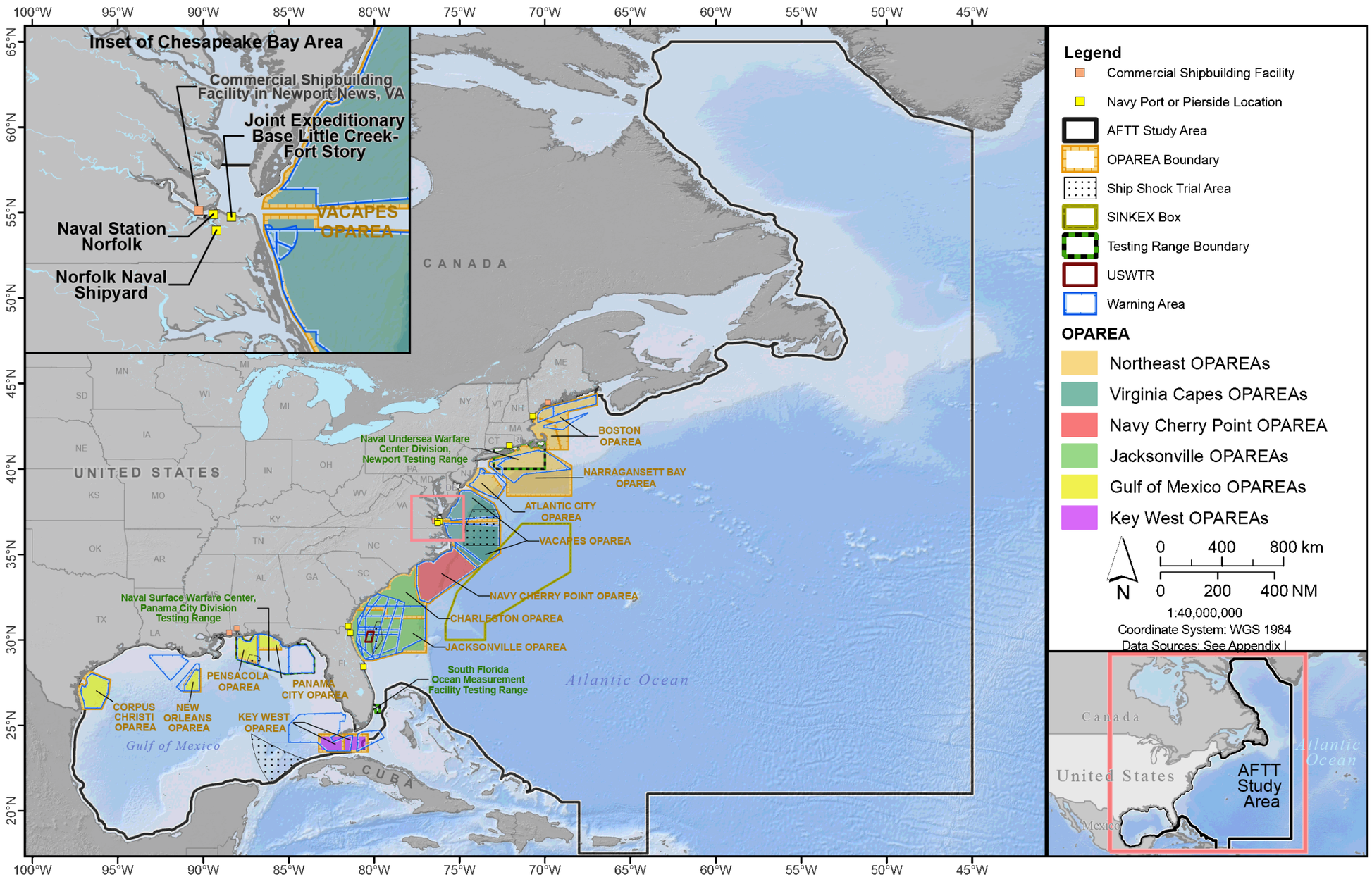
The AFTT EIS/OEIS Study Area includes areas of the western Atlantic Ocean along the east coast of North America, portions of the Caribbean Sea, and the Gulf of Mexico. The Study Area begins at the mean high tide line along the U.S. coast and extends east to the 45-degree west longitude line, north to the 65 degree north latitude line, and south to approximately the 20-degree north latitude line. The Study Area also includes Navy pierside locations and port transit channels, bays, harbors, inshore waterways, and civilian ports where training and testing occurs (Section 2.1.10, Inshore Locations). The Study Area

generally follows the Commander Task Force 80 area of operations, covering approximately 2.6 million square nautical miles ($NM^2$) of ocean area, and includes designated Navy range complexes and associated operating areas (OPAREAs) and special use airspace. While the AFTT Study Area itself is very large, it is important to note that the vast majority of Navy training and testing occurs in designated range complexes and testing ranges, as explained in Section 1.4 (Purpose and Need).

A Navy range complex consists of geographic areas that encompass a water component (above and below the surface) and airspace and may encompass a land component where training and testing of military platforms, tactics, munitions, explosives, and electronic warfare systems occur. Range complexes include established OPAREAs and special use airspace, which may be further divided to provide better control of the area for safety reasons. The terms used to describe the components of the range complexes are described below:

- **Airspace**
    - **Special Use Airspace**. Airspace of defined dimensions where activities must be confined because of their nature or where limitations may be imposed upon aircraft operations that are not part of those activities (Federal Aviation Administration Order 7400.8). Types of special use airspace most commonly found in range complexes include the following:
        - **Restricted Areas**. Airspace where aircraft are subject to restriction due to the existence of unusual, often invisible hazards (e.g., release of ordnance) to aircraft. Some areas are under strict control of the Department of Defense (DoD) and some are shared with non-military agencies.
        - **Warning Areas**. Areas of defined dimensions, extending from 3 nautical miles (NM) outward from the coast of the United States, which serve to warn non-participating aircraft of potential danger.
        - **Air Traffic Control Assigned Airspace**. Airspace of defined vertical/lateral limits, assigned by Air Traffic Control, for the purpose of providing air traffic segregation between the specified activity being conducted within the assigned airspace and other instrument flight rules traffic.
- **Sea and Undersea Space**
    - **Operating Areas**. An ocean area defined by geographic coordinates with defined surface and subsurface areas and associated special use airspace. OPAREAs include the following:
        - **Restricted Areas**. A restricted area is a defined water area for the purpose of prohibiting or limiting public access to the area. Restricted areas generally provide security for government property and also provide protection to the public from the risks of damage or injury arising from the government's use of that area (Title 33 Code of Federal Regulations [CFR] part 334).

The Study Area includes only the at-sea components of the range complexes and testing ranges; land components associated with the range complexes and testing ranges are not included in the Study Area and no activities on these land areas are included as part of the Proposed Action. The Study Area also includes various bays, harbors, inshore waterways, and pierside locations within the boundaries of the range complexes; these are detailed in Section 2.1.10 (Inshore Locations).




Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; SINKEX: Sinking Exercise; USWTR: Undersea Warfare Training Range; VACAPES: Virginia Capes

**Figure 2.1-1: Atlantic Fleet Training and Testing Study Area**

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The Study Area is depicted in Figure 2.1-1. Regional maps contained in Figure 2.1-2 through Figure 2.1-4 show additional detail of the range complexes and testing ranges. The range complexes and testing ranges are described in the following sections.

## 2.1.1 NORTHEAST RANGE COMPLEXES

The Northeast Range Complexes include the Boston Range Complex, Narragansett Bay Range Complex, and Atlantic City Range Complex (Figure 2.1-2). These range complexes span 761 miles (mi.) along the coast from Maine to New Jersey. The Northeast Range Complexes include special use airspace with associated warning areas and surface and subsurface sea space of the Boston OPAREA, Narragansett Bay OPAREA, and Atlantic City OPAREA.

### 2.1.1.1 Airspace

The Northeast Range Complexes include over 25,000 $NM^2$ of special use airspace. The altitude at which aircraft may fly varies from just above the surface to 60,000 feet (ft.), except for one specific warning area (W-107A) in the Atlantic City Range Complex, which is 18,000 ft. to unlimited altitudes. Six warning areas are located within the Northeast Range Complexes.

### 2.1.1.2 Sea and Undersea Space

The Northeast Range Complexes include three OPAREAs—Boston, Narragansett Bay, and Atlantic City. These OPAREAs encompass over 45,000 $NM^2$ of sea space and undersea space. The Boston, Narragansett Bay, and Atlantic City OPAREAs are offshore of the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey. The OPAREAs of the three complexes are outside 3 NM but within 200 NM from shore.

## 2.1.2 NAVAL UNDERSEA WARFARE CENTER DIVISION, NEWPORT TESTING RANGE

The Naval Undersea Warfare Center Division, Newport Testing Range includes the waters of Narragansett Bay, Rhode Island Sound, Block Island Sound, Buzzards Bay, Vineyard Sound, and Long Island Sound (Figure 2.1-2).

### 2.1.2.1 Airspace

A portion of Naval Undersea Warfare Center Division, Newport Testing Range is under restricted area R-4105A, known as No Man's Land Island. A minimal amount of testing occurs in the airspace within Naval Undersea Warfare Center Division, Newport Testing Range.

### 2.1.2.2 Sea and Undersea Space

Three restricted areas are located within the Naval Undersea Warfare Center Division, Newport Testing Range:

- Coddington Cove Restricted Area (0.5 $NM^2$ adjacent to Naval Undersea Warfare Center Division, Newport)
- Narragansett Bay Restricted Area (6.1 $NM^2$ area surrounding Gould Island), including the Hole Test Area and the North Test Range
- Rhode Island Sound Restricted Area, a rectangular box (27.2 $NM^2$) located in Rhode Island and Block Island Sounds

### 2.1.3 VIRGINIA CAPES RANGE COMPLEX

The Virginia Capes Range Complex spans 270 mi. along the coast from Delaware to North Carolina from the shoreline to 155 NM seaward (Figure 2.1-2). The Virginia Capes Range Complex includes special use airspace with associated warning and restricted areas and surface and subsurface sea space of the Virginia Capes OPAREA. The Virginia Capes Range Complex also includes established mine warfare training areas located within the lower Chesapeake Bay and off the coast of Virginia.

#### 2.1.3.1 Airspace

The Virginia Capes Range Complex includes over 28,000 $NM^2$ of special use airspace. Flight altitudes range from the surface to unlimited altitudes. Five warning areas are located within the Virginia Capes Range Complex. Restricted airspace extends from the shoreline to approximately the 3-NM state territorial sea limit within the Virginia Capes Range Complex and is designated as R-6606.

#### 2.1.3.2 Sea and Undersea Space

The Virginia Capes Range Complex shore boundary roughly follows the shoreline from Delaware to North Carolina; the seaward boundary extends 155 NM into the Atlantic Ocean proximate to Norfolk, Virginia. The Virginia Capes OPAREA encompasses over 27,000 $NM^2$ of sea space and undersea space. The Virginia Capes OPAREA is offshore of the states of Delaware, Maryland, Virginia, and North Carolina.

### 2.1.4 NAVY CHERRY POINT RANGE COMPLEX

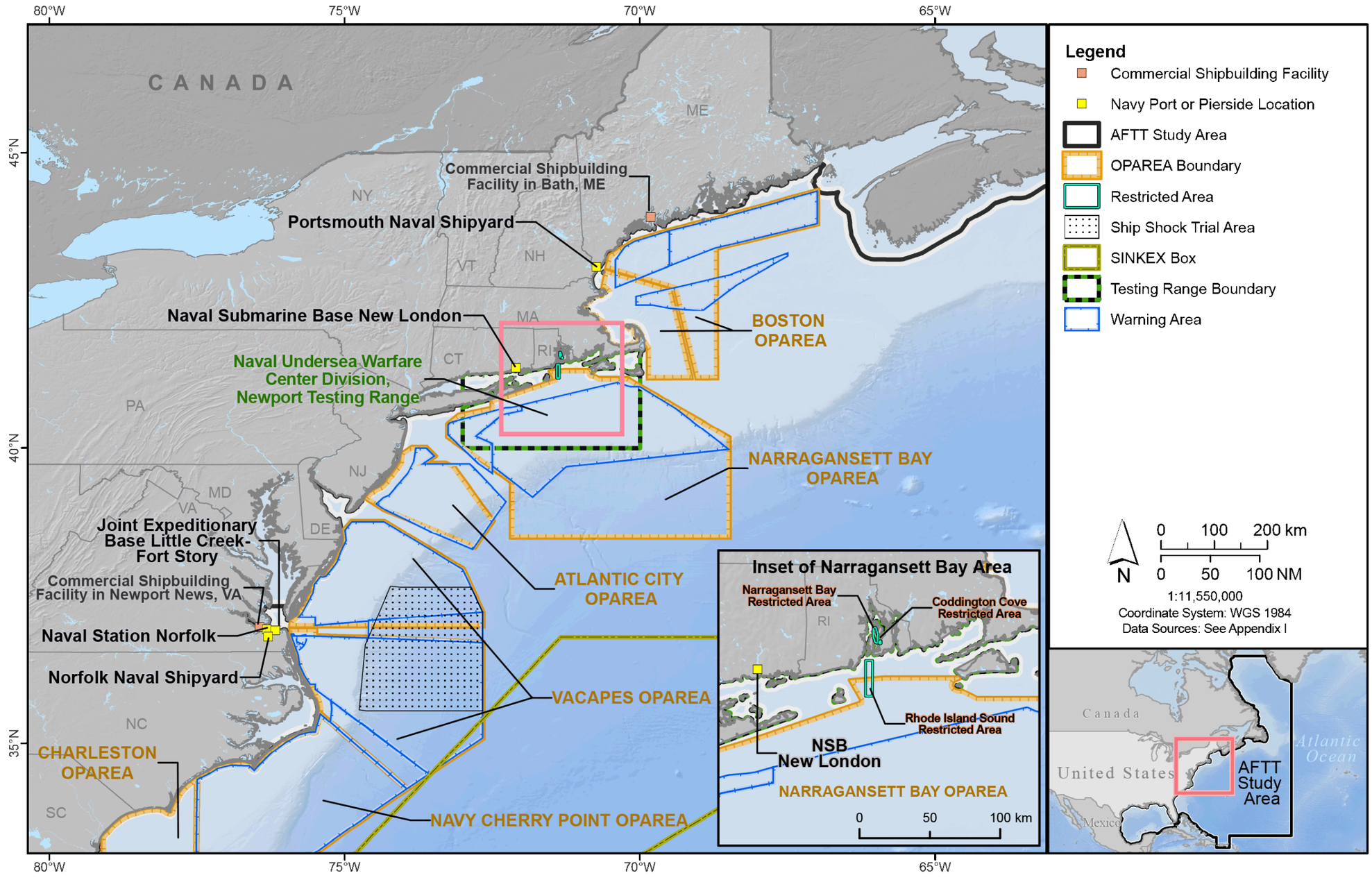
The Navy Cherry Point Range Complex, off the coast of North Carolina and South Carolina, encompasses the sea space from the shoreline to 120 NM seaward. The Navy Cherry Point Range Complex includes special use airspace with associated warning areas and surface and subsurface sea space of the Navy Cherry Point OPAREA (Figure 2.1-3). The Navy Cherry Point Range Complex is adjacent to the U.S. Marine Corps Cherry Point and Camp Lejeune Range Complexes associated with Marine Corps Air Station Cherry Point and Marine Corps Base Camp Lejeune.

#### 2.1.4.1 Airspace

The Navy Cherry Point Range Complex includes over 18,000 $NM^2$ of special use airspace. The airspace varies from the surface to unlimited altitudes. A single warning area is located within the Navy Cherry Point Range Complex.

#### 2.1.4.2 Sea and Undersea Space

The Navy Cherry Point Range Complex is roughly aligned with the shoreline and extends out 120 NM into the Atlantic Ocean. The Navy Cherry Point OPAREA encompasses over 18,000 $NM^2$ of sea space and undersea space.




Notes: AFTT: Atlantic Fleet Training and Testing; NSB: Naval Submarine Base; OPAREA: Operating Area; SINKEX: Sinking Exercise; VACAPES: Virginia Capes

**Figure 2.1-2: Study Area, Northeast and Mid-Atlantic Region**

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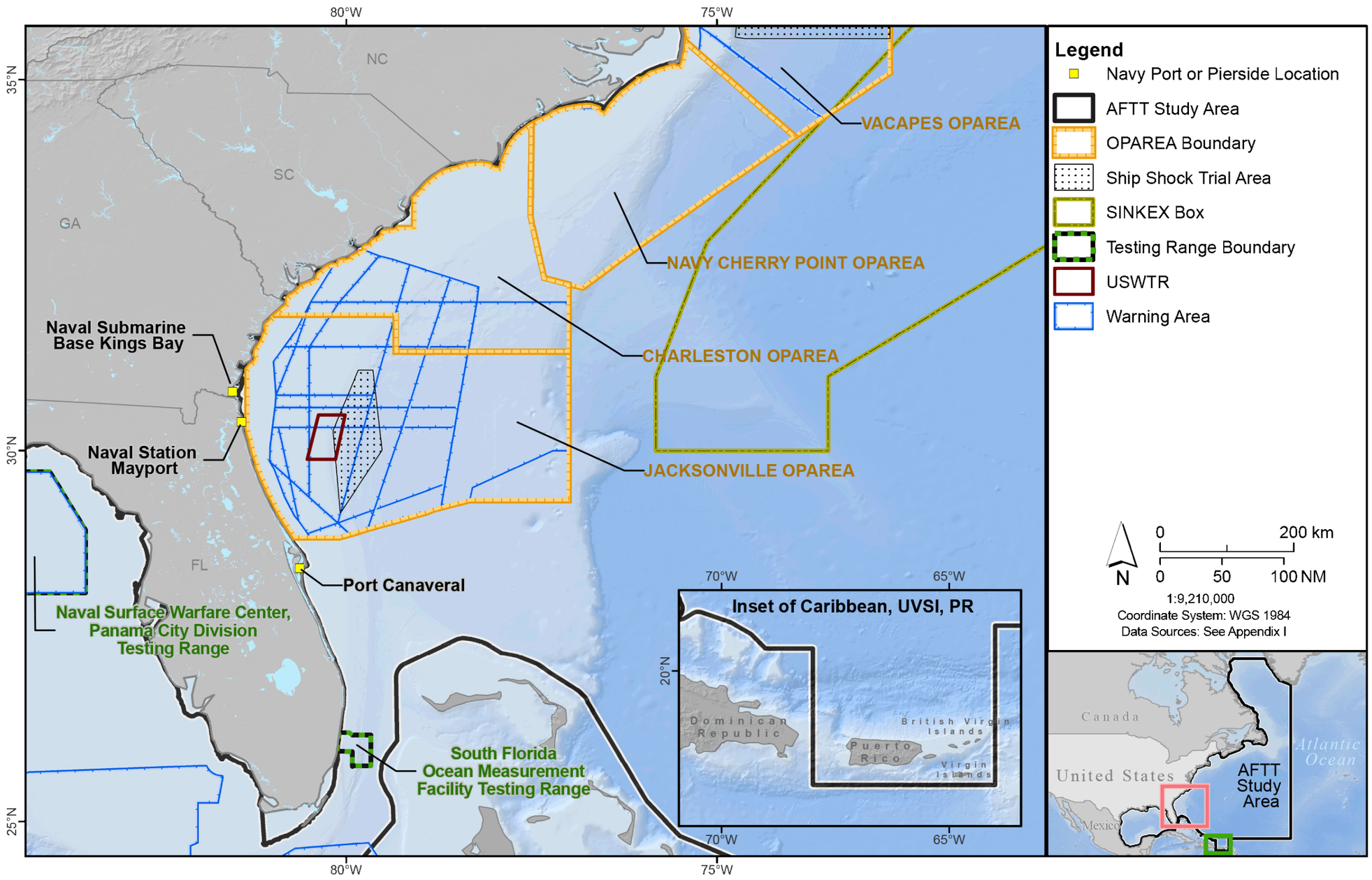


Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; SINKEX: Sinking Exercise; USWTR: Undersea Warfare Training Range; VACAPES: Virginia Capes

**Figure 2.1-3: Study Area, Southeast Region and Caribbean Sea**

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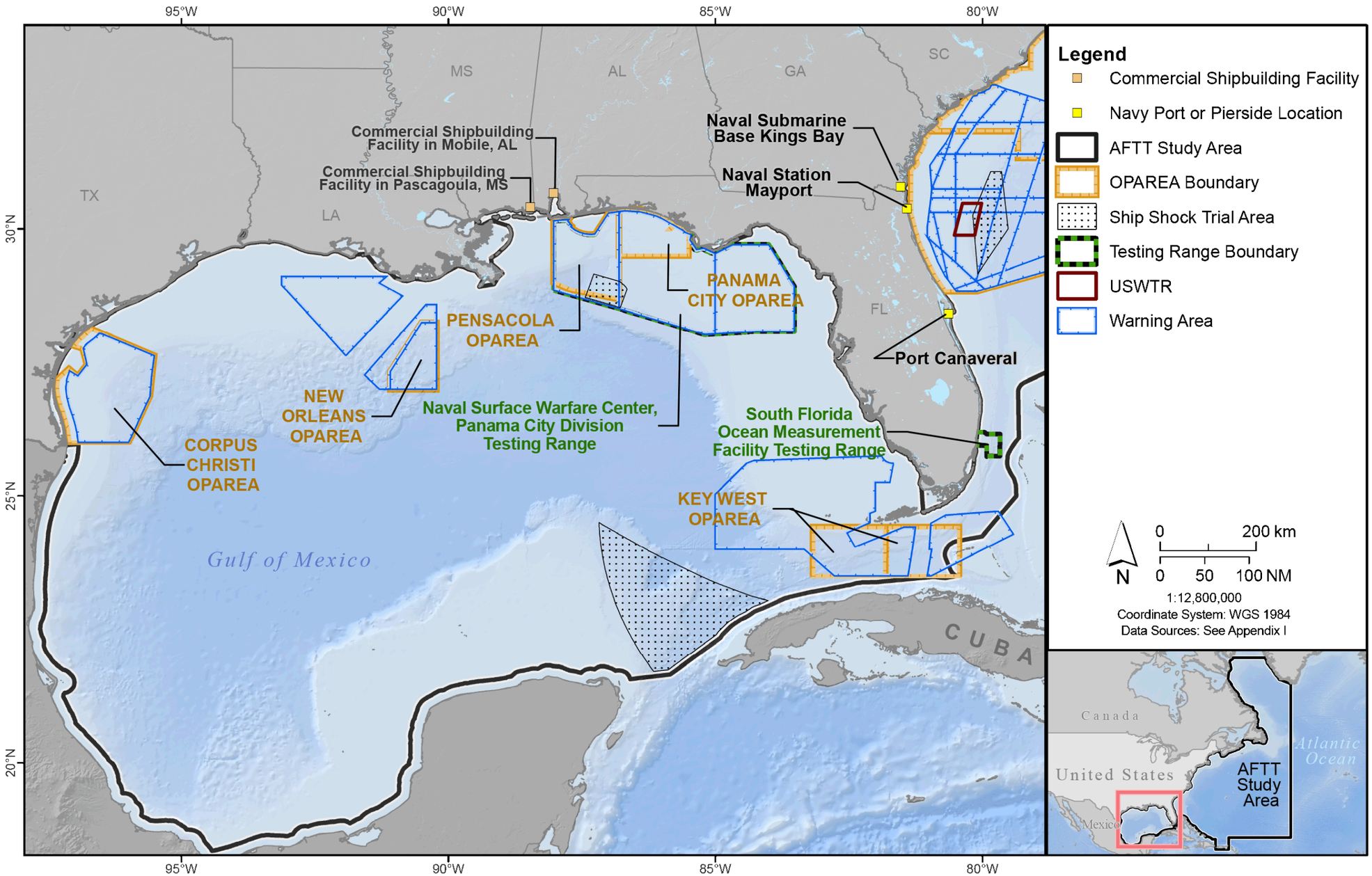


Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; USWTR: Undersea Warfare Training Range

**Figure 2.1-4: Study Area, Gulf of Mexico Region**

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## 2.1.5 JACKSONVILLE RANGE COMPLEX

The Jacksonville Range Complex spans 520 mi. along the coast from North Carolina to Florida from the shoreline to 250 NM seaward. The Jacksonville Range Complex includes special use airspace with associated warning areas and surface and subsurface sea space of the Charleston and Jacksonville OPAREAs. The Undersea Warfare Training Range is located within the Jacksonville Range Complex (Figure 2.1-3).

### 2.1.5.1 Airspace

The Jacksonville Range Complex includes approximately 40,000 $NM^2$ of special use airspace. Flight altitudes range from the surface to unlimited altitudes. Nine warning areas are located within the Jacksonville Range Complex.

### 2.1.5.2 Sea and Undersea Space

The Jacksonville Range Complex shore boundary roughly follows the shoreline and extends out 250 NM into the Atlantic Ocean proximate to Jacksonville, Florida. The Jacksonville Range Complex includes two OPAREAs: Charleston and Jacksonville. Combined, these OPAREAs encompass over 50,000 $NM^2$ of sea space and undersea space. The Charleston and Jacksonville OPAREAs are offshore of the states of North Carolina, South Carolina, Georgia, and Florida. The Undersea Warfare Training Range is located within the Jacksonville Range Complex.

## 2.1.6 NAVAL SURFACE WARFARE CENTER CARDEROCK DIVISION, SOUTH FLORIDA OCEAN MEASUREMENT FACILITY TESTING RANGE

The Naval Surface Warfare Center Carderock Division operates the South Florida Ocean Measurement Facility Testing Range, an offshore testing area in support of various Navy and non-Navy programs. The South Florida Ocean Measurement Facility Testing Range is located adjacent to the Port Everglades entrance channel in Fort Lauderdale, Florida (Figure 2.1-3). The test area at the South Florida Ocean Measurement Facility Testing Range includes an extensive cable field located within a restricted anchorage area and two designated submarine OPAREAs.

### 2.1.6.1 Airspace

The South Florida Ocean Measurement Facility Testing Range does not have associated special use airspace. The airspace adjacent to the South Florida Ocean Measurement Facility Testing Range is managed by the Fort Lauderdale International Airport. Air operations at the South Florida Ocean Measurement Facility Testing Range are coordinated with Fort Lauderdale International Airport by the air units involved in the testing events.

### 2.1.6.2 Sea and Undersea Space

The South Florida Ocean Measurement Facility Testing Range is divided into four subareas:

- The Port Everglades Shallow Submarine OPAREA is a 120-$NM^2$ area that encompasses nearshore waters from the shoreline to 900 ft. deep and 8 NM offshore.
- The Training Minefield is a 41-$NM^2$ area used for special purpose surface ship and submarine operations where the test vessels are restricted from maneuvering and require additional protection. This Training Minefield encompasses waters from 60 to 600 ft. deep and from 1 to 3 NM offshore.

- The Port Everglades Deep Submarine OPAREA is a 335-$NM^2$ area that encompasses the offshore range from 900 to 2,500 ft. in depth and from 9 to 25 NM offshore.
- The Port Everglades Restricted Anchorage Area is an 11-$NM^2$ restricted anchorage area ranging in depths from 60 to 600 ft. where the majority of the South Florida Ocean Measurement Facility Testing Range cables run from offshore sensors to the shore facility and where several permanent measurement arrays are used for vessel signature acquisition.

## 2.1.7 KEY WEST RANGE COMPLEX

The Key West Range Complex lies off the southwestern coast of mainland Florida and along the southern Florida Keys, extending seaward into the Gulf of Mexico 150 NM and south into the Straits of Florida 60 NM. The Key West Range Complex includes special use airspace with associated warning areas and surface and subsurface sea space of the Key West OPAREA (Figure 2.1-4).

### 2.1.7.1 Airspace

The Key West Range Complex includes over 20,000 $NM^2$ of special use airspace. Flight altitudes range from the surface to unlimited altitudes. Eight warning areas, Bonefish Air Traffic Control Assigned Airspace, and Tortugas Military OPAREA are located within the Key West Range Complex.

### 2.1.7.2 Sea and Undersea Space

The Key West OPAREA is over 8,000 $NM^2$ of sea space and undersea space south of Key West, Florida.

## 2.1.8 NAVAL SURFACE WARFARE CENTER, PANAMA CITY DIVISION TESTING RANGE

The Naval Surface Warfare Center, Panama City Division Testing Range is located off the panhandle of Florida and Alabama, extending from the shoreline to 120 NM seaward, and includes St. Andrew Bay. Naval Surface Warfare Center, Panama City Division Testing Range also includes special use airspace and offshore surface and subsurface waters of offshore OPAREAs (Figure 2.1-4).

### 2.1.8.1 Airspace

Special use airspace associated with Naval Surface Warfare Center, Panama City Division Testing Range includes three warning areas.

### 2.1.8.2 Sea and Undersea Space

The Naval Surface Warfare Center, Panama City Division Testing Range includes the waters of St. Andrew Bay and the sea space within the Gulf of Mexico from the mean high tide line to 120 NM offshore. The Panama City OPAREA covers just over 3,000 $NM^2$ of sea space and lies off the coast of the Florida panhandle. The Pensacola OPAREA lies off the coast of Alabama and Florida west of the Panama City OPAREA and totals just under 5,000 $NM^2$.

## 2.1.9 GULF OF MEXICO RANGE COMPLEX

Unlike most of the range complexes previously described, the Gulf of Mexico Range Complex includes geographically separated areas throughout the Gulf of Mexico. The Gulf of Mexico Range Complex includes special use airspace with associated warning areas and restricted airspace and surface and subsurface sea space of the Panama City, Pensacola, New Orleans, and Corpus Christi OPAREAs (Figure 2.1-4).

### 2.1.9.1 Airspace

The Gulf of Mexico Range Complex includes approximately 20,000 $NM^2$ of special use airspace. Flight altitudes range from the surface to unlimited altitudes. Six warning areas are located within the Gulf of

Mexico Range Complex. Restricted airspace associated with the Pensacola OPAREA, designated R-2908, extends from the shoreline to approximately 3 NM offshore.

#### 2.1.9.2 Sea and Undersea Space

The Gulf of Mexico Range Complex encompasses approximately 17,000 $NM^2$ of sea and undersea space and includes 285 NM of coastline. The OPAREAs span from the eastern shores of Texas to the western panhandle of Florida. They are described as follows:

- Panama City OPAREA lies off the coast of the Florida panhandle and totals approximately 3,000 $NM^2$.
- Pensacola OPAREA lies off the coast of Florida west of the Panama City OPAREA and totals approximately 4,900 $NM^2$.
- New Orleans OPAREA lies off the coast of Louisiana and totals approximately 2,600 $NM^2$.
- Corpus Christi OPAREA lies off the coast of Texas and totals approximately 6,900 $NM^2$.

### 2.1.10 INSHORE LOCATIONS

Although within the boundaries of the range complexes detailed in Section 2.1.1 (Northeast Range Complex) through Section 2.1.9 (Gulf of Mexico Range Complex), various inshore locations, including piers, bays, and civilian ports, are identified in Appendix A (Navy Activity Descriptions) for various activities (Figure 2.2-1).

#### 2.1.10.1 Pierside Locations

For purposes of this EIS/OEIS, pierside locations include channels and transit routes in ports and facilities associated with the following Navy ports and naval shipyards:

- Portsmouth Naval Shipyard, Kittery, Maine
- Naval Submarine Base New London, Groton, Connecticut
- Naval Station Norfolk, Norfolk, Virginia
- Joint Expeditionary Base Little Creek-Fort Story, Virginia Beach, Virginia
- Norfolk Naval Shipyard, Portsmouth, Virginia
- Naval Submarine Base Kings Bay, Kings Bay, Georgia
- Naval Station Mayport, Jacksonville, Florida
- Port Canaveral, Cape Canaveral, Florida

Navy-contractor shipyards in the following cities are also in the Study Area:

- Bath, Maine
- Groton, Connecticut
- Newport News, Virginia
- Mobile, Alabama
- Pascagoula, Mississippi

#### 2.1.10.2 Bays, Harbors, and Inshore Waterways

Inshore waterways used for training and testing activities include:

- Narragansett Bay Range Complex/Naval Undersea Warfare Center Division, Newport Testing Range: Thames River, Narragansett Bay
- Virginia Capes Range Complex: James River and tributaries, Broad Bay, York River
- Jacksonville Range Complex: southeast Kings Bay, Cooper River, St. Johns River

- Gulf of Mexico Range Complex/Naval Surface Warfare Center, Panama City Division: St. Andrew Bay
- Key West Range Complex: Truman Harbor, Demolition Key

#### 2.1.10.3 Civilian Ports

Civilian ports included for civilian port defense training events are listed in Section A.2.8.3 of Appendix A (Navy Activity Descriptions) and include:

- Boston, Massachusetts
- Earle, New Jersey
- Delaware Bay, Delaware
- Hampton Roads, Virginia
- Morehead City, North Carolina
- Wilmington, North Carolina
- Kings Bay, Georgia
- Savannah, Georgia
- Mayport, Florida
- Port Canaveral, Florida
- Tampa, Florida
- Beaumont, Texas
- Corpus Christi, Texas

## 2.2 PRIMARY MISSION AREAS

The Navy categorizes its activities into functional warfare areas called primary mission areas. These activities generally fall into the following seven primary mission areas:

- air warfare
- amphibious warfare
- anti-submarine warfare
- electronic warfare
- expeditionary warfare
- mine warfare
- surface warfare

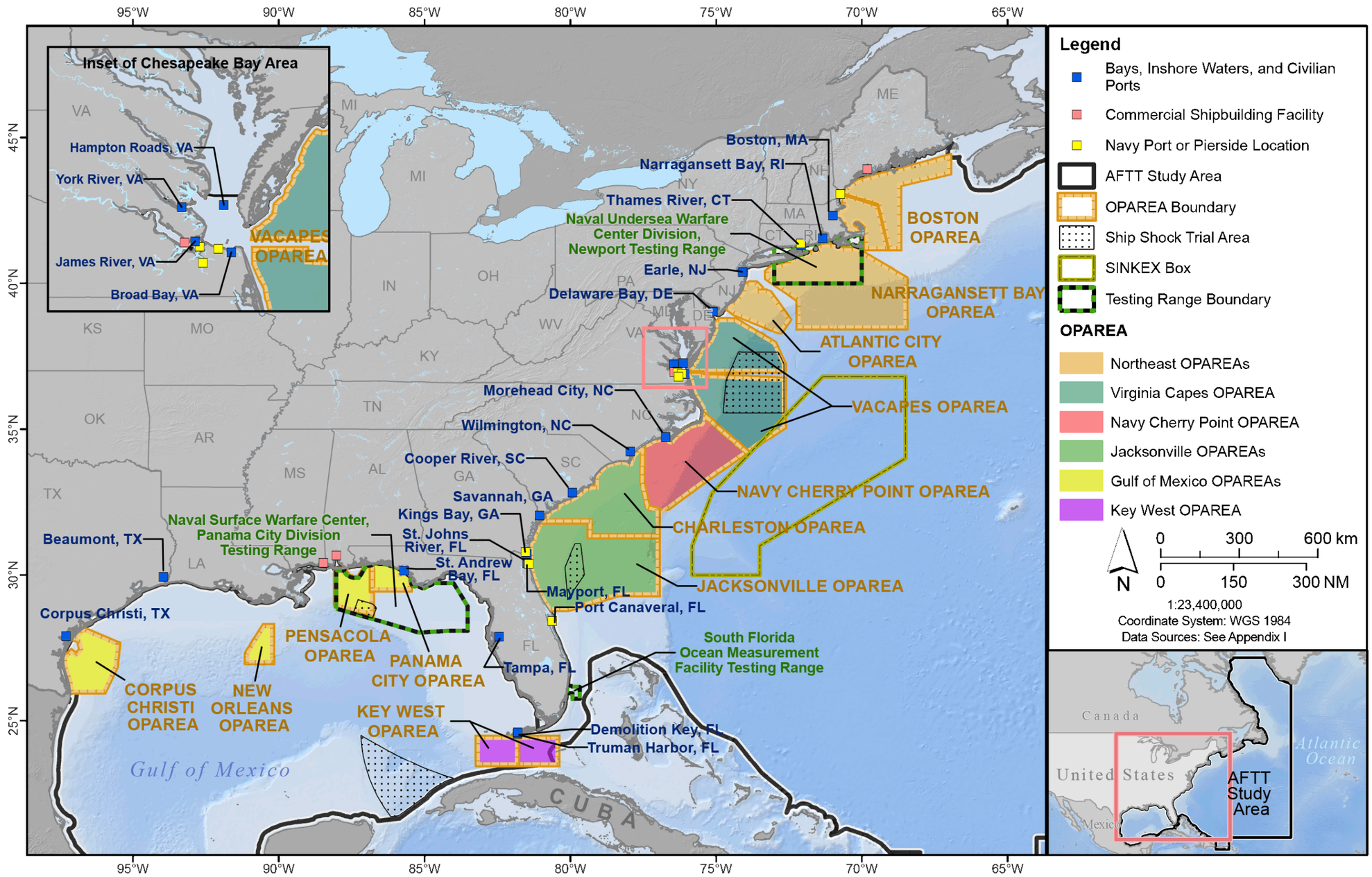
Most activities addressed in this EIS/OEIS are categorized under one of these primary mission areas; the testing community has three additional categories of activities for vessel evaluation, unmanned systems, and acoustic and oceanographic science and technology. Activities that do not fall within these areas are listed as "other activities." Each warfare community (surface, subsurface, aviation, and special warfare) may train in some or all of these primary mission areas. The research and acquisition community also categorizes most, but not all, of its testing activities under these primary mission areas. A description of the sonar, munitions, targets, systems and other material used during training and testing activities within these primary mission areas is provided in Appendix A (Navy Activity Descriptions).

### 2.2.1 AIR WARFARE

The mission of air warfare is to destroy or reduce enemy air and missile threats (including unmanned airborne threats) and serves two purposes: to protect U.S. forces from attacks from the air and to gain air superiority. Air warfare provides U.S. forces with adequate attack warnings, while denying hostile forces the ability to gather intelligence about U.S. forces.

Aircraft conduct air warfare through radar search, detection, identification, and engagement of airborne threats. Surface ships conduct air warfare through an array of modern anti-aircraft weapon systems such as aircraft detecting radar, naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled cannons for close-in point defense.

Testing of air warfare systems is required to ensure the equipment is fully functional under the conditions in which it will be used. Tests may be conducted on radar and other early warning detection and tracking systems, new guns or gun rounds, and missiles. Testing of these systems may be conducted on new ships and aircraft, and on existing ships and aircraft following maintenance, repair, or modification. For some systems, tests are conducted periodically to assess operability. Additionally, tests may be conducted in support of scientific research to assess new and emerging technologies.




Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; SINKEX: Sinking Exercise; VACAPES: Virginia Capes

**Figure 2.2-1: Study Area, Inshore Locations**

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### 2.2.2 AMPHIBIOUS WARFARE

The mission of amphibious warfare is to project military power from the sea to the shore (i.e., attack a threat on land by a military force embarked on ships) through the use of naval firepower and expeditionary landing forces. Amphibious warfare operations include small unit reconnaissance or raid missions to large-scale amphibious exercises involving multiple ships and aircraft combined into a strike group.

Amphibious warfare training ranges from individual, crew, and small unit events to large task force exercises. Individual and crew training include amphibious vehicles and naval gunfire support training. Such training includes shore assaults, boat raids, airfield or port seizures, and reconnaissance. Large-scale amphibious exercises involve ship-to-shore maneuver, naval fire support, such as shore bombardment, air strikes, and attacks on targets that are in close proximity to friendly forces.

Testing of guns, munitions, aircraft, ships, and amphibious vessels and vehicles used in amphibious warfare are often integrated into training activities and, in most cases, the systems are used in the same manner in which they are used for fleet training activities. Amphibious warfare tests, when integrated with training activities or conducted separately as full operational evaluations on existing amphibious vessels and vehicles following maintenance, repair, or modernization, may be conducted independently or in conjunction with other amphibious ship and aircraft activities. Testing is performed to ensure effective ship-to-shore coordination and transport of personnel, equipment, and supplies. Tests may also be conducted periodically on other systems, vessels, and aircraft intended for amphibious operations to assess operability and to investigate efficacy of new technologies.

### 2.2.3 ANTI-SUBMARINE WARFARE

The mission of anti-submarine warfare is to locate, neutralize, and defeat hostile submarine forces that threaten Navy forces. Anti-submarine warfare is based on the principle that surveillance and attack aircraft, ships, and submarines all search for hostile submarines. These forces operate together or independently to gain early warning and detection and to localize, track, target, and attack submarine threats.

Anti-submarine warfare training addresses basic skills such as detecting and classifying submarines, as well as evaluating sounds to distinguish between enemy submarines and friendly submarines, ships, and marine life. More advanced training integrates the full spectrum of anti-submarine warfare from detecting and tracking a submarine to attacking a target using either exercise torpedoes (i.e., torpedoes that do not contain a warhead) or simulated weapons. These integrated anti-submarine warfare training exercises are conducted in coordinated, at-sea training events involving submarines, ships, and aircraft.

Testing of anti-submarine warfare systems is conducted to develop new technologies and assess weapon performance and operability with new systems and platforms, such as unmanned systems. Testing uses ships, submarines, and aircraft to demonstrate capabilities of torpedoes, missiles, countermeasure systems, and underwater surveillance and communications systems. Tests may be conducted as part of a large-scale fleet training event involving submarines, ships, fixed-wing aircraft, and helicopters. These integrated training events offer opportunities to conduct research and acquisition activities and to train aircrew in the use of new or newly enhanced systems during a large-scale, complex exercise.

### 2.2.4 ELECTRONIC WARFARE

The mission of electronic warfare is to degrade the enemy's ability to use electronic systems, such as communication systems and radar, and to confuse or deny them the ability to defend their forces and

assets. Electronic warfare is also used to detect enemy threats and counter their attempts to degrade the electronic capabilities of the Navy.

Typical electronic warfare training activities include threat avoidance, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices to defeat tracking and communications systems.

Testing of electronic warfare systems is conducted to improve the capabilities of systems and ensure compatibility with new systems. Testing involves the use of aircraft, surface ships, and submarine crews to evaluate the effectiveness of electronic systems. Similar to training activities, typical electronic warfare testing activities include the use of airborne and surface electronic jamming devices (including testing chaff and flares, see Appendix A, Navy Activity Descriptions, for a description of these devices) to defeat tracking and communications systems. Chaff tests evaluate newly developed or enhanced chaff, chaff dispensing equipment, or modified aircraft systems' use against chaff deployment. Flare tests evaluate deployment performance and crew competency with newly developed or enhanced flares, flare dispensing equipment, or modified aircraft systems' use against flare deployment.

### 2.2.5 EXPEDITIONARY WARFARE

The mission of expeditionary warfare is to provide security and surveillance in the littoral (at the shoreline), riparian (along a river), or coastal environments. Expeditionary warfare is wide ranging and includes defense of harbors, operation of remotely operated vehicles, defense against swimmers, and boarding/seizure operations.

Expeditionary warfare training activities include underwater construction team training, dive and salvage operations, and insertion/extraction via air, surface, and subsurface platforms.

### 2.2.6 MINE WARFARE

The mission of mine warfare is to detect, classify, and avoid or neutralize (disable) mines to protect Navy ships and submarines and to maintain free access to ports and shipping lanes. Mine warfare also includes offensive mine laying to gain control of or deny the enemy access to sea space. Naval mines can be laid by ships, submarines, or aircraft.

Mine warfare neutralization training includes exercises in which ships, aircraft, submarines, underwater vehicles, unmanned vehicles, or marine mammal detection systems search for mine shapes. Personnel train to destroy or disable mines by attaching underwater explosives to or near the mine or using remotely operated vehicles to destroy the mine.

Testing and development of mine warfare systems is conducted to improve sonar, laser, and magnetic detectors intended to hunt, locate, and record the positions of mines for avoidance or subsequent neutralization. Mine warfare testing and development falls into two primary categories: mine detection and classification, and mine countermeasure and neutralization. Mine detection and classification testing involves the use of air, surface, and subsurface vessels and uses sonar, including towed and side-scan sonar, and unmanned vehicles to locate and identify objects underwater. Mine detection and classification systems are sometimes used in conjunction with a mine neutralization system. Mine countermeasure and neutralization testing includes the use of air, surface, and subsurface units to evaluate the effectiveness of tracking devices, countermeasure and neutralization systems, and general purpose bombs to neutralize mine threats. Most neutralization tests use mine shapes, or non-explosive practice mines, to evaluate a new or enhanced capability. For example, during a mine neutralization test, a previously located mine is destroyed or rendered nonfunctional using a helicopter or

manned/unmanned surface vehicle based system that may involve the deployment of a towed neutralization system.

A small percentage of mine warfare tests require the use of high-explosive mines to evaluate and confirm the ability of the system to neutralize a high-explosive mine under operational conditions. The majority of mine warfare systems are deployed by ships, helicopters, and unmanned vehicles. Tests may also be conducted in support of scientific research to support these new technologies.

### 2.2.7 Surface Warfare

The mission of surface warfare is to obtain control of sea space from which naval forces may operate and entails offensive action against other surface and subsurface targets while also defending against enemy forces. In surface warfare, aircraft use cannons, air-launched cruise missiles, or other precision-guided munitions; ships employ torpedoes, naval guns, and surface-to-surface missiles; and submarines attack surface ships using torpedoes or submarine-launched, anti-ship cruise missiles.

Surface warfare training includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and submarine missile or torpedo launch events, and other munitions against surface targets.

Testing of weapons used in surface warfare is conducted to develop new technologies and to assess weapon performance and operability with new systems and platforms, such as unmanned systems. Tests include various air-to-surface guns and missiles, surface-to-surface guns and missiles, and bombing tests. Testing events may be integrated into training activities to test aircraft or aircraft systems in the delivery of ordnance on a surface target. In most cases the tested systems are used in the same manner in which they are used for fleet training activities.

## 2.3 Proposed Activities

The Navy has been conducting military readiness activities in the Study Area for well over a century and with active sonar for over 70 years. The tempo and types of training and testing activities have fluctuated because of the introduction of new technologies, the evolving nature of international events, advances in warfighting doctrine and procedures, and changes in force structure (organization of ships, weapons, and personnel). Such developments influenced the frequency, duration, intensity, and location of required training and testing activities. This EIS/OEIS (Phase III) reflects the most up to date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The types and numbers of activities included in the Proposed Action accounts for fluctuations in training and testing in order to meet evolving or emergent military readiness requirements. For the purposes of this EIS/OEIS, the term “ship” is inclusive of surface ships and surfaced submarines. The term “vessel” is inclusive of ships and small boats (e.g., rigid-hull inflatable boats). In the following sections, the proposed training and testing activities are detailed.

### 2.3.1 Proposed Training Activities

A major training exercise comprises several “unit level” type exercises conducted by several units operating together while commanded and controlled by a single commander. These exercises typically employ an exercise scenario developed to train and evaluate the strike group in naval tactical tasks. In a major training exercise, most of the operations and activities being directed and coordinated by the strike group commander are identical in nature to the operations conducted during individual, crew, and smaller unit-level training events. In a major training exercise, however, these disparate training tasks are conducted in concert, rather than in isolation. Some integrated or coordinated anti-submarine warfare exercises are similar in that they are composed of several unit level exercises but are generally

on a smaller scale than a major training exercise, are shorter in duration, use fewer assets, and use fewer hours of hull-mounted sonar per exercise. Coordinated training exercises involve multiple units working together to meet unit-level training requirements, whereas integrated training exercises involve multiple units working together to certify for deployment. These coordinated exercises are conducted under anti-submarine warfare. Three key factors used to identify and group the exercises are the scale of the exercise, duration of the exercise, and amount of hull-mounted sonar hours modeled/used for the exercise.

Table 2.3-1 provides the differences between major anti-submarine warfare training events and smaller integrated/coordinated anti-submarine exercises based on scale, duration, and sonar hours for the purposes of exercise reporting requirements.

The training activities proposed by the Navy are described in Table 2.3-2, which include the activity name and a short description of the activity. Appendix A (Navy Activity Descriptions) has more detailed descriptions of the activities.

**Table 2.3-1: Major Anti-Submarine Warfare Training Exercises and Integrated/Coordinated Training**

| | *Exercise Group* | *Description* | *Scale* | *Duration* | *Location* | *Exercise Examples* | *Modeled Hull-Mounted Sonar per Exercise* |
|---|---|---|---|---|---|---|---|
| Major Training Exercise | Large Integrated ASW | Larger-scale, longer duration integrated ASW exercises | Greater than 6 surface ASW units (up to 30 with the largest exercises), 2 or more submarines, multiple ASW aircraft | Generally greater than 10 days | JAX RC<br>Navy Cherry Point RC<br>VACAPES RC | COMPTUEX | >500 hours |
| | Medium Integrated ASW | Medium-scale, medium duration integrated ASW exercises | Approximately 3–8 surface ASW units, at least 1 submarine, multiple ASW aircraft | Generally 4–10 days | JAX RC<br>Navy Cherry Point RC<br>VACAPES RC | FLEETEX/ SUSTEX | 100–500 hours |
| Integrated/ Coordinated Training | Small Integrated ASW | Small-scale, short duration integrated ASW exercises | Approximately 3–6 surface ASW units, 2 dedicated submarines, 2–6 ASW aircraft | Generally less than 5 days | JAX RC<br>Navy Cherry Point RC<br>VACAPES RC | SWATT, NUWTAC | 50–100 hours |
| | Medium Coordinated ASW | Medium-scale, medium duration, coordinated ASW exercises | Approximately 2–4 surface ASW units, possibly a submarine, 2–5 ASW aircraft | Generally 3–10 days | JAX RC<br>Navy Cherry Point RC<br>VACAPES RC | TACDEVEX | Less than 100 hours |
| | Small Coordinated ASW | Small-scale, short duration, coordinated ASW exercises | Approximately 2–4 surface ASW units, possibly a submarine, 1–2 ASW aircraft | Generally 2–4 days | JAX RC<br>Navy Cherry Point RC<br>VACAPES RC | ARG/MEU, Group Sail | Less than 50 hours |

Notes: ASW: anti-submarine warfare; JAX: Jacksonville; RC: Range Complex; VACAPES: Virginia Capes; COMTUEX: Composite Training Unit Exercise; FLEETEX/SUSTEX: Fleet Exercise/Sustainment Exercise; SWATT: Surface Warfare Advanced Tactical Training Exercise; NUWTAC: Navy Undersea Warfare Training Assessment Course; TACDEVEX: Tactical Development Exercise; ARG/MEU: Amphibious Ready Group/Marine Expeditionary Unit

## Table 2.3-2: Proposed Training Activities

| *Activity Name* | *Activity Description* |
|---|---|
| ***Major Training Exercises – Large Integrated Anti-Submarine Warfare*** | |
| Composite Training Unit Exercise | Aircraft carrier and its associated aircraft integrate with surface and submarine units in a challenging multi-threat operational environment in order to certify them for deployment. Only the anti-submarine warfare portion of a Composite Training Unit Exercise is included in this activity; other training objectives are met via unit-level training described in each of the primary mission areas below. |
| ***Major Training Exercises – Medium Integrated Anti-Submarine Warfare*** | |
| Fleet Exercises/Sustainment Exercise | Aircraft carrier and its associated aircraft integrate with surface and submarine units in a challenging multi-threat operational environment in order to maintain their ability to deploy. Fleet Exercises and Sustainment Exercises are similar to Composite Training Unit Exercises, but are shorter in duration. |
| ***Integrated/Coordinated Training – Small Integrated Anti-Submarine Warfare Training*** | |
| Naval Undersea Warfare Training Assessment Course | Multiple ships, aircraft, and submarines integrate the use of their sensors to search for, detect, classify, localize, and track a threat submarine in order to launch an exercise torpedo. |
| Surface Warfare Advanced Tactical Training | Multiple ships and aircraft use sensors, including sonobuoys, to search, detect, and track a threat submarine. Surface Warfare Advanced Tactical Training exercises are not dedicated anti-submarine warfare events and involve multiple warfare areas. |
| ***Integrated/Coordinated Training – Medium Coordinated Anti-Submarine Warfare Training*** | |
| Anti-Submarine Warfare Tactical Development Exercise | Surface ships, aircraft, and submarines coordinate to search for, detect, and track submarines. |
| ***Integrated/Coordinated Training – Small Coordinated Anti-Submarine Warfare Training*** | |
| Amphibious Ready Group/Marine Expeditionary Unit Exercise | Navy and Marine Corps forces conduct advanced training at sea in preparation for deployment. |
| Group Sail | Surface ships and rotary-wing aircraft search for, detect, and track threat submarines. Group Sails are not dedicated anti-submarine warfare events and involve multiple warfare areas; non-anti-submarine warfare training objectives are met via unit-level training described in the primary mission areas below. |
| ***Air Warfare*** | |
| Air Combat Maneuver | Fixed-wing aircrews aggressively maneuver against threat aircraft to gain tactical advantage. |
| Air Defense Exercises | Aircrews and ship crews conduct defensive measures against threat aircraft or simulated missiles. |
| Gunnery Exercise Air-to-Air Medium-Caliber | Fixed-wing aircraft fire medium-caliber guns at air targets. |
| Gunnery Exercise Surface-to-Air Large-Caliber | Surface ship crews fire large-caliber guns at air targets. |
| Gunnery Exercise Surface-to-Air Medium-Caliber | Surface ship crews fire medium-caliber guns at air targets. |
| Missile Exercise Air-to-Air | Fixed-wing and helicopter aircrews fire air-to-air missiles at air targets. |
| Missile Exercise Surface-to-Air | Surface ship crews fire surface-to-air missiles at air targets. |

## Table 2.3-2: Proposed Training Activities (continued)

| *Activity Name* | *Activity Description* |
|---|---|
| Missile Exercise Man-Portable Air Defense System | Personnel employ shoulder-fired surface-to-air missiles at air targets. |
| ***Amphibious Warfare*** | |
| Amphibious Marine Expeditionary Unit Integration Exercise | Navy and Marine Corps forces conduct integration training at sea in preparation for deployment certification. |
| Amphibious Assault | Large unit forces move ashore from amphibious ships at sea for the immediate execution of inland objectives. |
| Amphibious Raid | Small unit forces move from amphibious ships at sea to shore locations for a specific short-term mission. These are quick operations with as few personnel as possible. |
| Amphibious Vehicle Maneuvers | Personnel operate amphibious vehicles for driver training. |
| Humanitarian Assistance Operations | Navy and Marine Corps forces evacuate noncombatants from hostile or unsafe areas or provide humanitarian assistance in times of disaster. |
| Marine Expeditionary Unit Certification Exercise | Amphibious Ready Group exercises are conducted to validate the Marine Expeditionary Unit's readiness for deployment and includes small boat raids; visit, board, search, and seizure training; helicopter and mechanized amphibious raids; and a non-combatant evacuation operations. |
| Naval Surface Fire Support Exercise – At Sea | Surface ship crews use large-caliber guns to support forces ashore; however, the land target is simulated at sea. Rounds are scored by passive acoustic buoys located at or near the target area. |
| Naval Surface Fire Support Exercise – Land-Based Target | Surface ship crews fire large-caliber guns at land-based targets to support forces ashore. |
| ***Anti-Submarine Warfare*** | |
| Anti-Submarine Warfare Torpedo Exercise – Helicopter | Helicopter aircrews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets. |
| Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft | Maritime patrol aircraft aircrews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets. |
| Anti-Submarine Warfare Torpedo Exercise – Ship | Surface ship crews search for, track, and detect submarines. Exercise torpedoes are used. |
| Anti-Submarine Warfare Torpedo Exercise – Submarine | Submarine crews search for, track, and detect submarines. Exercise torpedoes are used. |
| Anti-Submarine Warfare Tracking Exercise – Helicopter | Helicopter aircrews search for, track, and detect submarines. |
| Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft | Maritime patrol aircraft aircrews search for, track, and detect submarines. |
| Anti-Submarine Warfare Tracking Exercise – Ship | Surface ship crews search for, track, and detect submarines. |
| Anti-Submarine Warfare Tracking Exercise – Submarine | Submarine crews search for, track, and detect submarines. |
| ***Electronic Warfare*** | |
| Counter Targeting Chaff Exercise – Aircraft | Fixed-wing aircraft and helicopter aircrews deploy chaff to disrupt threat targeting and missile guidance radars. |
| Counter Targeting Chaff Exercise – Ship | Surface ship crews deploy chaff to disrupt threat targeting and missile guidance radars. |
| Counter Targeting Flare Exercise | Fixed-wing aircraft and helicopter aircrews deploy flares to disrupt threat infrared missile guidance systems. |

## Table 2.3-2: Proposed Training Activities (continued)

| *Activity Name* | *Activity Description* |
|---|---|
| Electronic Warfare Operations | Aircraft and surface ship crews control the electromagnetic spectrum used by enemy systems to degrade or deny the enemy's ability to take defensive actions. |
| High-Speed Anti-Radiation Missile Exercise | Aircrews launch a High-Speed Anti-Radiation Missile against threat radar sites. |
| ***Expeditionary Warfare*** | |
| Dive and Salvage Operations | Navy divers perform dive operations and salvage training. |
| Maritime Security Operations – Anti-Swimmer Grenades | Small boat crews engage in force protection activities by using anti-swimmer grenades to defend against hostile divers. |
| Personnel Insertion/Extraction – Air | Personnel are inserted into and extracted from an objective area by airborne platforms. |
| Personnel Insertion/Extraction – Surface and Subsurface | Personnel are inserted into and extracted from an objective area by small boats or subsurface platforms. |
| Personnel Insertion/Extraction Training – Swimmer/Diver | Divers and swimmer infiltrate harbors, beaches, or moored vessels and conduct a variety of tasks. |
| Underwater Construction Team Training | Navy divers conduct underwater repair and construction. |
| ***Mine Warfare*** | |
| Airborne Mine Countermeasures – Mine Detection | Helicopter aircrews detect mines using towed or laser mine detection systems. |
| Airborne Mine Countermeasures – Towed Mine Neutralization | Helicopter crews tow systems through the water that are designed to disable or trigger mines. |
| Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercise | Maritime security personnel train to protect civilian ports against enemy efforts to interfere with access to those ports. |
| Coordinated Unit-Level Helicopter Airborne Mine Countermeasure Exercise | A detachment of helicopter aircrews train as a unit in the use of airborne mine countermeasures, such as towed mine detection and neutralization systems. |
| Mine Countermeasures – Mine Neutralization – Remotely Operated Vehicles | Ship, small boat, and helicopter crews locate and disable mines using remotely operated underwater vehicles. |
| Mine Countermeasures – Ship Sonar | Ship crews detect and avoid mines while navigating restricted areas or channels using active sonar. |
| Mine Laying | Fixed-wing aircraft drop non-explosive mine shapes. |
| Mine Neutralization – Explosive Ordnance Disposal | Personnel disable threat mines using explosive charges. |
| Underwater Mine Countermeasures Raise, Tow, Beach, and Exploitation Operations | Personnel locate mines, perform mine neutralization, raise and tow the mines to the beach, and conduct exploitation operations for intelligence gathering. |
| ***Surface Warfare*** | |
| Bombing Exercise Air-to-Surface | Fixed-wing aircrews deliver bombs against surface targets. |
| Fast Attack Craft and Fast Inshore Attack Craft Exercise | Navy surface ship and helicopter crews defend against small boat attacks. |
| Gunnery Exercise Air-to-Surface Medium-Caliber | Fixed-wing and helicopter aircrews fire medium-caliber guns at surface targets. |
| Gunnery Exercise Air-to-Surface Small-Caliber | Helicopter and tiltrotor aircrews use small-caliber guns to engage surface targets. |

## Table 2.3-2: Proposed Training Activities (continued)

| *Activity Name* | *Activity Description* |
|---|---|
| Gunnery Exercise Surface-to-Surface Boat Medium-Caliber | Small boat crews fire medium-caliber guns at surface targets. |
| Gunnery Exercise Surface-to-Surface Boat Small-Caliber | Small boat crews fire small-caliber guns at surface targets. |
| Gunnery Exercise Surface-to-Surface Ship Large-Caliber | Surface ship crews fire large-caliber guns at surface targets. |
| Gunnery Exercise Surface-to-Surface Ship Medium-Caliber | Surface ship crews fire medium-caliber guns at surface targets. |
| Gunnery Exercise Surface-to-Surface Ship Small-Caliber | Surface ship crews fire small-caliber guns at surface targets. |
| Integrated Live Fire Exercise | Naval forces defend against a swarm of surface threats (ships or small boats) with bombs, missiles, rockets, and small-, medium- and large-caliber guns. |
| Laser Targeting – Aircraft | Fixed-wing and helicopter aircrews illuminate targets with targeting and directed energy lasers. |
| Laser Targeting – Ship | Surface ship crews illuminate air and surface targets with targeting and directed energy lasers. |
| Maritime Security Operations | Helicopter, surface ship, and small boat crews conduct a suite of maritime security operations. |
| Missile Exercise Air-to-Surface | Fixed-wing and helicopter aircrews fire air-to-surface missiles at surface targets. |
| Missile Exercise Air-to-Surface Rocket | Helicopter aircrews fire both precision-guided and unguided rockets at surface targets. |
| Missile Exercise Surface-to-Surface | Surface ship crews defend against surface threats (ships or small boats) and engage them with missiles. |
| Sinking Exercise | Aircraft, ship, and submarine crews deliberately sink a seaborne target, usually a decommissioned ship (made environmentally safe for sinking according to U.S. Environmental Protection Agency standards), with a variety of munitions. |
| ***Other Training Activities*** | |
| Elevated Causeway System | A temporary pier is constructed off the beach. Support pilings are driven into the sand and then later removed. |
| Precision Anchoring | Anchors are released in designated locations or moored to a buoy. |
| Search and Rescue | Surface ships, small boats, and helicopter rescue personnel at sea. |
| Submarine Navigation | Submarine crews operate sonar for navigation and object detection while transiting into and out of port during reduced visibility. |
| Submarine Sonar Maintenance and Systems Checks | Maintenance of submarine sonar systems is conducted pierside or at sea. |
| Submarine Under Ice Certification | Submarine crews train to operate under ice. Ice conditions are simulated during training and certification events. |
| Surface Ship Object Detection | Surface ship crews operate sonar for navigation and object detection while transiting in and out of port during reduced visibility. |

**Table 2.3-2: Proposed Training Activities (continued)**

| *Activity Name* | *Activity Description* |
|---|---|
| Surface Ship Sonar Maintenance and Systems Checks | Maintenance of surface ship sonar systems is conducted pierside or at sea. |
| Waterborne Training | Small boat crews conduct a variety of training, including launch and recovery, mooring to buoys, anchoring, and maneuvering. Small boats include rigid hull inflatable boats, and riverine patrol, assault and command boats up to approximately 50 feet in length. |

### 2.3.2 PROPOSED TESTING ACTIVITIES

The Navy's research and acquisition community engages in a broad spectrum of testing activities in support of the fleet. These activities include, but are not limited to, basic and applied scientific research and technology development; testing, evaluation, and maintenance of systems (e.g., missiles, radar, and sonar) and platforms (e.g., surface ships, submarines, and aircraft); and acquisition of systems and platforms to support Navy missions and give a technological edge over adversaries. The individual commands within the research and acquisition community included in this EIS/OEIS are Naval Air Systems Command, Naval Sea Systems Command, and the Office of Naval Research.

The Navy operates in an ever-changing strategic, tactical, financially constrained, and time-constrained environment. Testing activities occur in response to emerging science or fleet operational needs. For example, future Navy experiments to develop a better understanding of ocean currents may be designed based on advancements made by non-government researchers not yet published in the scientific literature. Similarly, future but yet unknown Navy operations within a specific geographic area may require development of modified Navy assets to address local conditions. Such modifications must be tested in the field to ensure they meet fleet needs and requirements. Accordingly, generic descriptions of some of these activities are the best that can be articulated in a long-term, comprehensive document, like this EIS/OEIS.

Some testing activities are similar to training activities conducted by the fleet. For example, both the fleet and the research and acquisition community fire torpedoes. While the firing of a torpedo might look identical to an observer, the difference is in the purpose of the firing. The fleet might fire the torpedo to practice the procedures for such a firing, whereas the research and acquisition community might be assessing a new torpedo guidance technology or testing it to ensure the torpedo meets performance specifications and operational requirements.

#### 2.3.2.1 Naval Air Systems Command Testing Activities

Naval Air Systems Command testing activities generally fall in the primary mission areas used by the fleets. Naval Air Systems Command activities include, but are not limited to, the testing of new aircraft platforms (e.g., the F-35 Joint Strike Fighter aircraft), weapons, and systems (e.g., newly developed sonobuoys) that will ultimately be integrated into fleet training activities. In addition to the testing of new platforms, weapons, and systems, Naval Air Systems Command also conducts lot acceptance testing of weapons and systems, such as sonobuoys.

The majority of testing activities conducted by Naval Air Systems Command are similar to fleet training activities, and many platforms and systems currently being tested are already being used by the fleet or will ultimately be integrated into fleet training activities. However, some testing activities may be conducted in different locations and in a different manner than similar fleet training activities and,

therefore, the analysis for those events and the potential environmental effects may differ. Training with systems and platforms delivered to the fleet within the timeframe of this document are analyzed in the training sections of this EIS/OEIS. Table 2.3-3 addresses Naval Air Systems Command's proposed testing activities.

**Table 2.3-3: Naval Air Systems Command's Proposed Testing Activities**

| *Activity Name* | *Activity Description* |
|---|---|
| ***Air Warfare*** | |
| Air Combat Maneuver Test | Aircrews engage in flight maneuvers designed to gain a tactical advantage during combat. |
| Air Platform Weapons Integration Test | Test performed to quantify the compatibility of weapons with the aircraft from which they would be launched or released. Non-explosive weapons or shapes are used. |
| Air Platform-Vehicle Test | Test performed to quantify the flying qualities, handling, airworthiness, stability, controllability, and integrity of an air platform or vehicle. No explosive weapons are released during an air platform/vehicle test. |
| Air-to-Air Weapons System Test | Test to evaluate the effectiveness of air-launched weapons against designated air targets. |
| Air-to-Air Gunnery Test – Medium-Caliber | Test performed to evaluate the effectiveness of air-to-air guns against designated airborne targets. Fixed-wing aircraft may be used. |
| Air-to-Air Missile Test | Test performed to evaluate the effectiveness of air-launched missiles against designated airborne targets. Fixed-wing aircraft will be used. |
| Intelligence, Surveillance, and Reconnaissance Test | Aircrews use all available sensors to collect data on threat vessels. |
| ***Anti-Submarine Warfare*** | |
| Anti-Submarine Warfare Torpedo Test | This event is similar to the training event torpedo exercise. Test evaluates anti-submarine warfare systems onboard rotary-wing (e.g., helicopter) and fixed-wing aircraft and the ability to search for, detect, classify, localize, track, and attack a submarine or similar target. |
| Anti-Submarine Warfare Tracking Test – Helicopter | This event is similar to the training event anti-submarine warfare tracking exercise – helicopter. The test evaluates the sensors and systems used to detect and track submarines and to ensure that helicopter systems used to deploy the tracking system perform to specifications. |
| Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft | The test evaluates the sensors and systems used by maritime patrol aircraft to detect and track submarines and to ensure that aircraft systems used to deploy the tracking systems perform to specifications and meet operational requirements. |
| Kilo Dip | Functional check of a helicopter deployed dipping sonar system prior to conducting a testing or training event using the dipping sonar system. |
| Sonobuoy Lot Acceptance Test | Sonobuoys are deployed from surface vessels and aircraft to verify the integrity and performance of a production lot or group of sonobuoys in advance of delivery to the fleet for operational use. |
| ***Electronic Warfare*** | |
| Chaff Test | This event is similar to the training event chaff exercise. Chaff tests evaluate newly developed or enhanced chaff, chaff dispensing equipment, or modified aircraft systems against chaff deployment. Tests may also train pilots and aircrews in the use of new chaff dispensing equipment. Chaff tests are often conducted with flare tests and air combat maneuver events, as well as other test events, and are not typically conducted as standalone tests. |

## Table 2.3-3: Naval Air Systems Command's Proposed Testing Activities (continued)

| *Activity Name* | *Activity Description* |
|---|---|
| Electronic Systems Evaluation | Test that evaluates the effectiveness of electronic systems to control, deny, or monitor critical portions of the electromagnetic spectrum. In general, electronic warfare testing will assess the performance of three types of electronic warfare systems: electronic attack, electronic protect, and electronic support. |
| Flare Test | This event is similar to the training event flare exercise. Flare tests evaluate newly developed or enhanced flares, flare dispensing equipment, or modified aircraft systems against flare deployment. Tests may also train pilots and aircrews in the use of newly developed or modified flare deployment systems. Flare tests are often conducted with chaff tests and air combat maneuver events, as well as other test events, and are not typically conducted as standalone tests. |
| ***Mine Warfare*** | |
| Airborne Dipping Sonar Minehunting Test | A mine-hunting dipping sonar system that is deployed from a helicopter and uses high-frequency sonar for the detection and classification of bottom and moored mines. |
| Airborne Laser Based Mine Detection System Test | An airborne mine hunting test of a laser based mine detection system that is operated from a helicopter and evaluates the system's ability to detect, classify, and fix the location of floating mines and mines moored near the surface. The system uses a low-energy laser to locate mines. |
| Airborne Mine Neutralization System Test | A test of the airborne mine neutralization system evaluates the system's ability to detect and destroy mines from an airborne mine countermeasures capable helicopter. The airborne mine neutralization system uses up to four unmanned underwater vehicles equipped with high-frequency sonar, video cameras, and explosive and non-explosive neutralizers. |
| Airborne Sonobuoy Minehunting Test | A mine-hunting system made up of a field of sonobuoys deployed by a helicopter. A field of sonobuoys, using high-frequency sonar, is used to detect and classify bottom and moored mines. |
| Mine Laying Test | Fixed-wing aircraft evaluate the performance of mine laying equipment and software systems to lay mines. A mine test may also train aircrews in laying mines using new or enhanced mine deployment system. |
| ***Surface Warfare*** | |
| Air-to-Surface Bombing Test | This event is similar to the training event bombing exercise air-to-surface. Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. |
| Air-to-Surface Gunnery Test | This event is similar to the training event gunnery exercise air-to-surface. Fixed-wing and rotary-wing aircrews evaluate new or enhanced aircraft guns against surface maritime targets to test that the guns, gun ammunition, or associated systems meet required specifications or to train aircrews in the operation of a new or enhanced weapon system. |
| Air-to-Surface Missile Test | This event is similar to the training event missile exercise air-to-surface. Test may involve both fixed-wing and rotary-wing aircraft launching missiles at surface maritime targets to evaluate the weapon system or as part of another system's integration test. |

**Table 2.3-3: Naval Air Systems Command's Proposed Testing Activities (continued)**

| *Activity Name* | *Activity Description* |
|---|---|
| High-Energy Laser Weapons Test | High-energy laser weapons tests evaluate the specifications, integration, and performance of an aircraft-mounted, high-energy laser used to disable small surface vessels. |
| Laser Targeting Test | Aircrews illuminate enemy targets with lasers. |
| Rocket Test | Rocket tests evaluate the integration, accuracy, performance, and safe separation of guided and unguided 2.75-inch rockets fired from a hovering or forward-flying helicopter. |
| ***Other Testing Activities*** | |
| Acoustic and Oceanographic Research | Active transmissions within the band 10 hertz–100 kilohertz from sources deployed from ships and aircraft. |
| Air Platform Shipboard Integrate Test | Fixed-wing and rotary-wing aircraft are tested to determine operability from shipboard platforms, performance of shipboard physical operations, and to verify and evaluate communications and tactical data links. |
| Maritime Security | Maritime patrol aircraft participate in maritime security activities and fleet training events. Aircraft identify, track, and monitor foreign merchant vessels suspected of non-compliance with United Nations-allied sanctions or conflict rules of engagement. |
| Shipboard Electronic Systems Evaluation | Tests measure ship antenna radiation patterns and test communication systems with a variety of aircraft. |
| Undersea Range System Test | Following installation of a Navy underwater warfare training and testing range, tests of the nodes (components of the range) will be conducted to include node surveys and testing of node transmission functionality. |

### 2.3.2.2 Naval Sea Systems Command Testing Activities

Naval Sea Systems Command activities are generally aligned with the primary mission areas used by the fleets. Additional activities include, but are not limited to, vessel evaluation, unmanned systems, and other testing activities. In this EIS/OEIS, pierside testing at Navy and contractor shipyards consists only of system testing.

Testing activities are conducted throughout the life of a Navy ship, from construction through deactivation from the fleet, to verification of performance and mission capabilities. Activities include pierside and at-sea testing of ship systems, including sonar, acoustic countermeasures, radars, launch systems, weapons, unmanned systems, and radio equipment; tests to determine how the ship performs at sea (sea trials); development and operational test and evaluation programs for new technologies and systems; and testing on all ships and systems that have undergone overhaul or maintenance.

One ship of each new class (or major upgrade) of combat ships constructed for the Navy typically undergoes an at-sea ship shock trial. A ship shock trial consists of a series of underwater detonations that send shock waves through the ship's hull to simulate near misses during combat. A shock trial allows the Navy to assess the survivability of the hull and ship's systems in a combat environment as well as the capability of the ship to protect the crew. Table 2.3-4 describes Naval Sea Systems Command's proposed testing activities.

## Table 2.3-4: Naval Sea Systems Command's Proposed Testing Activities

| *Activity Name* | *Activity Description* |
|---|---|
| ***Anti-Submarine Warfare*** | |
| Anti-Submarine Warfare Mission Package Testing | Ships and their supporting platforms (e.g., helicopters, unmanned aerial systems) detect, localize, and attack submarines. |
| At-Sea Sonar Testing | At-sea testing to ensure systems are fully functional in an open ocean environment. |
| Countermeasure Testing | Countermeasure testing involves the testing of systems that will detect, localize, track, and attack incoming weapons including marine vessel targets. Testing includes surface ship torpedo defense systems and marine vessel stopping payloads. |
| Pierside Sonar Testing | Pierside testing to ensure systems are fully functional in a controlled pierside environment prior to at-sea test activities. |
| Submarine Sonar Testing/ Maintenance | Pierside testing of submarine systems occurs periodically following major maintenance periods and for routine maintenance. |
| Surface Ship Sonar Testing/ Maintenance | Pierside and at-sea testing of ship systems occur periodically following major maintenance periods and for routine maintenance. |
| Torpedo (Explosive) Testing | Air, surface, or submarine crews employ explosive and non-explosive torpedoes against artificial targets. |
| Torpedo (Non-Explosive) Testing | Air, surface, or submarine crews employ non-explosive torpedoes against submarines or surface vessels. |
| ***Electronic Warfare*** | |
| Radar and Other System Testing | Test may include radiation of military or commercial radar communication systems (or simulators), or high-energy lasers. Testing may occur aboard a ship against drones, small boats, rockets, missiles, or other targets. |
| ***Mine Warfare*** | |
| Mine Countermeasure and Neutralization Testing | Air, surface, and subsurface vessels neutralize threat mines and mine-like objects. |
| Mine Countermeasure Mission Package Testing | Vessels and associated aircraft conduct mine countermeasure operations. |
| Mine Detection and Classification Testing | Air, surface, and subsurface vessels and systems detect, classify, and avoid mines and mine-like objects. Vessels also assess their potential susceptibility to mines and mine-like objects. |
| ***Surface Warfare*** | |
| Gun Testing – Large-Caliber | Surface crews test large-caliber guns to defend against surface targets with large-caliber guns. |
| Gun Testing – Medium-Caliber | Surface crews defend against targets with medium-caliber guns. |
| Gun Testing – Small-Caliber | Surface crews defend against targets with small-caliber guns. |
| Kinetic Energy Weapon Testing | A kinetic energy weapon uses stored energy released in a burst to accelerate a projectile. |
| Missile and Rocket Testing | Missile and rocket testing includes various missiles or rockets fired from submarines and surface combatants. Testing of the launching system and ship defense is performed. |
| ***Unmanned Systems*** | |
| Underwater Search, Deployment, and Recovery | Various underwater, bottom crawling, robotic vehicles are utilized in underwater search, recovery, installation, and scanning activities. |
| Unmanned Aerial System Testing | Unmanned aerial systems are launched from a platform (e.g., fixed platform or submerged submarine) to test the capability to extend the surveillance and communications range of unmanned underwater vehicles, manned and unmanned surface vehicles, and submarines. |

## Table 2.3-4: Naval Sea Systems Command's Proposed Testing Activities (continued)

| *Activity Name* | *Activity Description* |
|---|---|
| Unmanned Surface Vehicle System Testing | Testing involves the development or upgrade of unmanned surface vehicles. This may include testing of mine detection capabilities, evaluating the basic functions of individual platforms, or complex events with multiple vehicles. |
| Unmanned Underwater Vehicle Testing | Testing involves the development or upgrade of unmanned underwater vehicles. This may include testing of mine detection capabilities, evaluating the basic functions of individual platforms, or complex events with multiple vehicles. |
| ***Vessel Evaluation*** | |
| Aircraft Carrier Sea Trials – Propulsion Testing | Ship is run at high speeds in various formations (e.g., straight-line and reciprocal paths). |
| Air Defense Testing | Test the ship's capability to detect, identify, track, and successfully engage live and simulated targets. Gun systems are tested using explosive or non-explosive rounds. |
| Hydrodynamic and Maneuverability Testing | Submarines maneuver in the submerged operating environment. |
| In-Port Maintenance Testing | Each combat system is tested to ensure they are functioning in a technically acceptable manner and are operationally ready to support at-sea testing. |
| Large Ship Shock Trial | Underwater detonations are used to test new ships or major upgrades. |
| Propulsion Testing | Ship is run at high speeds in various formations (e.g., straight-line and reciprocal paths). |
| Signature Analysis Operations | Surface ship and submarine testing of electromagnetic, acoustic, optical, and radar signature measurements. |
| Small Ship Shock Trial | Underwater detonations are used to test new ships or major upgrades. |
| Submarine Sea Trials – Propulsion Testing | Submarine is run at high speeds in various formations and depths. |
| Submarine Sea Trials – Weapons System Testing | Submarine weapons and sonar systems are tested at-sea to meet integrated combat system certification requirements. |
| Surface Warfare Testing | Tests capability of shipboard sensors to detect, track, and engage surface targets. Testing may include ships defending against surface targets using explosive and non-explosive rounds, gun system structural test firing and demonstration of the response to Call for Fire against land-based targets (simulated by sea-based locations). |
| Total Ship Survivability Trials | Series of simulated "realistic" weapon hit scenarios with resulting damage and recoverability exercises against an aircraft carrier. |
| Undersea Warfare Testing | Ships demonstrate capability of countermeasure systems and underwater surveillance, weapons engagement, and communications systems. This tests ships' ability to detect, track, and engage underwater targets. |
| Vessel Signature Evaluation | Surface ship, submarine, and auxiliary system signature assessments. This may include electronic, radar, acoustic, infrared, and magnetic signatures, refueling capabilities. |
| ***Other Testing Activities*** | |
| Acoustic Component Testing | Various surface vessels, moored equipment, and materials are tested to evaluate performance in the marine environment. |
| Chemical and Biological Simulant Testing | Chemical-biological agent simulants are deployed against surface ships. |

**Table 2.3-4: Naval Sea Systems Command's Proposed Testing Activities (continued)**

| *Activity Name* | *Activity Description* |
|---|---|
| Insertion/Extraction | Testing of submersibles capable of inserting and extracting personnel and payloads into denied areas from strategic distances. |
| Line Charge Testing | Surface vessels deploy line charges to test the capability to safely clear an area for expeditionary forces. |
| Non-Acoustic Component Testing | Tests of towed or floating buoys for communications through radio frequencies or two-way optical communications between an aircraft and underwater system(s). |
| Payload Deployer Testing | Launcher systems are tested to evaluate performance. |
| Semi-Stationary Equipment Testing | Semi-stationary equipment (e.g., hydrophones) is deployed to determine functionality. |
| Towed Equipment Testing | Surface vessels or unmanned surface vehicles deploy and tow equipment to determine functionality of towed systems. |

#### 2.3.2.3 Office of Naval Research Testing Activities

As the Department of the Navy's science and technology provider, the Office of Naval Research provides technology solutions for Navy and Marine Corps needs. The Office of Naval Research's mission is to plan, foster, and encourage scientific research in recognition of its paramount importance as related to the maintenance of future naval power and the preservation of national security. The Office of Naval Research manages the Navy's basic, applied, and advanced research to foster transition from science and technology to higher levels of research, development, test, and evaluation. The Office of Naval Research is also a parent organization for the Naval Research Laboratory, which operates as the Navy's corporate research laboratory and conducts a broad multidisciplinary program of scientific research and advanced technological development. Testing conducted by the Office of Naval Research in the AFTT Study Area includes acoustic and oceanographic research, large displacement unmanned underwater vehicle (innovative naval prototype) research, and emerging mine countermeasure technology research. Table 2.3-5 describes the Office of Naval Research's proposed testing activities.

**Table 2.3-5: Office of Naval Research Proposed Testing Activities**

| *Activity Name* | *Activity Description* |
|---|---|
| ***Acoustic and Oceanographic Science and Technology*** | |
| Acoustic and Oceanographic Research | Research using active transmissions from sources deployed from ships and unmanned underwater vehicles. Research sources can be used as proxies for current and future Navy systems. |
| Emerging Mine Countermeasure Technology Research | Test involves the use of broadband acoustic sources on unmanned underwater vehicles. |
| Large Displacement Unmanned Underwater Vehicle Testing | Autonomy testing and environmental data collection with Large Displacement Unmanned Underwater Vehicles. |

### 2.3.3 Standard Operating Procedures

For training and testing to be effective, units must be able to safely use their sensors and weapon systems as they are intended to be used in military missions and combat operations and to their optimum capabilities. Standard operating procedures applicable to training and testing have been developed through years of experience, and their primary purpose is to provide for safety (including public health and safety) and mission success. In many cases, there are benefits to environmental and cultural resources (some of which have high socioeconomic value in the Study Area) resulting from

standard operating procedures. Navy standard operating procedures are published or broadcast via numerous naval instructions and manuals, including but not limited to:

- Ship, submarine, and aircraft safety manuals
- Ship, submarine, and aircraft standard operating manuals
- Fleet Area Control and Surveillance Facility range operating instructions
- Fleet exercise publications and instructions
- Naval Sea Systems Command test range safety and standard operating instructions
- Navy instrumented range operating procedures
- Naval shipyard sea trial agendas
- Research, development, test, and evaluation plans
- Naval gunfire safety instructions
- Navy planned maintenance system instructions and requirements
- Federal Aviation Administration regulations
- International Regulations for Preventing Collisions at Sea

Because they are essential to safety and mission success, standard operating procedures are part of the Proposed Action and are considered in the Chapter 3 (Affected Environment and Environmental Consequences) environmental analysis for applicable resources. Standard operating procedures that provide a benefit to public health and safety, environmental resources, or cultural resources are discussed in the sections below and included in Appendix A (Navy Activity Descriptions).

Standard operating procedures (which are implemented for the purpose of safety and mission success) are different from mitigation measures (which are implemented for the purpose of avoiding or reducing potential impacts on environmental and cultural resources). A brief introduction to the activities, stressor categories, and geographic areas for which the Navy will implement mitigation is provided in Section 2.3.4 (Mitigation Measures). A full discussion of mitigation measures is presented in Chapter 5 (Mitigation).

#### 2.3.3.1 Sea Space and Airspace Deconfliction

The Navy schedules training and testing activities to minimize conflicts with the use of sea space and airspace within ranges and throughout the Study Area to ensure the safety of military personnel, the public, commercial aircraft, commercial and recreational vessels, and military assets. The Navy deconflicts its own use of sea space and airspace to allow for the necessary separation of multiple Navy units to prevent interference with equipment sensors and avoid interaction with established commercial air traffic routes and commercial shipping lanes. These standard operating procedures benefit public health and safety (including persons participating in activities that have socioeconomic value, such as recreational or commercial fishing) through a reduction in the potential for interactions with training and testing activities.

#### 2.3.3.2 Vessel Safety

Navy vessels are required to operate in accordance with applicable navigation rules, including Inland Navigation Rules (33 CFR 83) and International Regulations for Preventing Collisions at Sea (72 COLREGS), which were formalized in the Convention on the International Regulations for Preventing

Collisions at Sea, 1972. Applicable navigation requirements include, but are not limited to, Rule 5 (Lookouts) and Rule 6 (Safe Speed). These rules require that vessels at all times proceed at a safe speed so proper and effective action can be taken to avoid collision and so vessels can be stopped within a distance appropriate to the prevailing circumstances and conditions. Navy ships transit at speeds that are optimal for fuel conservation, maintaining ship schedules, and meeting mission requirements. Vessel captains use the totality of the circumstances to ensure the vessel is traveling at appropriate speeds in accordance with navigation rules. Depending on the circumstances, this may involve adjusting speeds during periods of reduced visibility or in certain locations. With limited exceptions (e.g., amphibious vessels operating in designated locations), Navy vessels avoid contact with the seafloor as a standard collision avoidance procedure to prevent damage to vessels. Information on vessels that will be used under the Proposed Action is provided in Section 3.0.3.3.4.1 (Vessels and In-Water Devices).

Ships operated by or for the Navy have personnel assigned to stand watch at all times, day and night, when moving through the water (underway) for safety of navigation, collision avoidance, range clearance, and man-overboard precautions. Watch personnel include officers, enlisted men and women, and civilians operating in similar capacities. To qualify to stand watch, personnel undertake extensive training that includes, but is not limited to, on-the-job instruction and a formal Personal Qualification Standard program (or equivalent program for civilians) to certify that they have demonstrated all necessary skills. While on watch, personnel employ visual search and reporting procedures in accordance with the U.S. Navy Lookout Training Handbook or civilian equivalent. Watch personnel are responsible for using correct scanning procedures while monitoring an assigned sector; estimating relative bearing, range, position angle, and target angle of sighted objects; and rapidly sending accurate reports of all visual information to the bridge and combat information center. After sunset and prior to sunrise, watch personnel employ night visual search techniques, which could include the use of night vision devices.

Watch personnel monitor their assigned sectors for any indication of danger to the ship and the personnel on board, such as a floating or partially submerged object or piece of debris, periscope, surfaced submarine, wisp of smoke, flash of light, or surface disturbance. As a standard collision avoidance procedure, watch personnel also monitor for marine mammals that have the potential to be in the direct path of the ship. Watch personnel duties may be performed in conjunction with other tasks or job responsibilities, such as navigating the ship or supervising other personnel. Watch personnel are not normally posted while ships are moored to a pier. When anchored or moored to a buoy, a watch team is still maintained but with fewer personnel than when underway.

The standard operating procedures for vessel safety benefit public health and safety, marine mammals, and seafloor resources through a reduction in the potential for vessel strikes.

#### 2.3.3.3 Aircraft Safety

Pilots of Navy aircraft make every attempt to avoid large flocks of birds and bats to reduce the safety risk involved with a potential strike. Since 2011, the Navy has required that all Navy flying units report all bird and bat strikes through the Web-Enabled Safety System Aviation Mishap and Hazard Reporting System. The standard operating procedures for aircraft safety benefit birds and bats through a reduction in the potential for aircraft strike.

#### 2.3.3.4 High-Energy Laser Safety

The Navy operates laser systems approved for fielding by the Laser Safety Review Board or service equivalent. Only properly trained and authorized personnel operate high-energy lasers within

designated OPAREAs and ranges. OPAREAs and ranges where lasers are used are required to have a Laser Range Safety Certification Report that is updated every 3 years. Prior to commencing activities involving high-energy lasers, the operator performs a search of the intended impact location to ensure that the area is clear of unauthorized persons. These standard operating procedures benefit public health and safety through a reduction in the potential for interaction with high-energy lasers.

### 2.3.3.5 Weapons Firing Safety

A Notice to Mariners is issued in advance of gunnery activities to alert the public to stay clear of the area, except for small-caliber crew-served weapons training when the immediate area around the firing ship is cleared visually. Locations where explosive bombing activities occur often have a standing Notice to Mariners. Notices to Mariners are issued in advance of explosive bombing activities conducted in locations that do not already have a standing notice. Additional information on Notices to Mariners is provided in Section 3.12.2.1.1 (Sea Space).

Most weapons firing activities that involve the use of explosive munitions are conducted during daylight hours. All missile and rocket firing activities are carefully planned in advance and conducted under strict procedures that place the ultimate responsibility for range safety on the Officer Conducting the Exercise or civilian equivalent. The weapons firing hazard range must be clear of non-participating vessels and aircraft before firing activities commence. The size of the firing hazard range is based on the farthest firing range capability of the weapon being used. All weapons firing stops when the Range Safety Officer receives a cease-fire order or when the line of fire could endanger non-participating vessels or aircraft. Pilots of Navy aircraft are not authorized to expend ordnance, fire missiles, or drop other airborne devices through extensive cloud cover where visual clearance for non-participating aircraft and vessels is not possible. The two exceptions to this requirement are: (1) when operating in the open ocean, clearance for non-participating aircraft and vessels through radar surveillance is acceptable, and (2) when the Officer Conducting the Exercise or civilian equivalent accepts responsibility for the safeguarding of airborne and surface traffic. These standard operating procedures benefit public health and safety, and marine mammals and sea turtles (by increasing the effectiveness of visual observations for mitigation in daylight hours), through a reduction in the potential for interaction with explosive weapons firing activities.

During activities that involve recoverable targets (e.g., aerial drones), the Navy recovers the target and any associated decelerators/parachutes to the maximum extent practicable consistent with personnel and equipment safety. Recovery of these items helps minimize materials that remain, which could potentially alert enemy forces to the presence of U.S. Navy assets during military missions and combat operations. This standard operating procedure benefits biological resources (e.g., marine mammals, sea turtles, fish) through a reduction in the potential for physical disturbance and strike, entanglement, and ingestion of applicable targets and any associated decelerators/parachutes. Additional information about military expended materials (including which are recoverable) is presented in Section 3.0.3.3.4.2 (Military Expended Materials) and Appendix F (Military Expended Material and Direct Strike Impact Analysis).

### 2.3.3.6 Target Deployment and Retrieval Safety

The deployment and retrieval of targets is dependent upon environmental conditions. The Beaufort sea state scale is a standardized measurement of the weather conditions, based primarily on wind speed. The scale is divided into levels from 0 to 12, with 12 indicating the most severe weather conditions (e.g., hurricane force winds). At Beaufort sea state number 4, wave heights typically range from 3.5 to 5 ft.

Firing exercises involving the deployment and retrieval of targets (e.g., integrated maritime portable acoustic scoring and simulation systems) from small boats are typically conducted in daylight hours in Beaufort sea state number 4 conditions or better to ensure safe operating conditions during target deployment and recovery. These standard operating procedures benefit public health and safety, and marine mammals and sea turtles (by increasing the effectiveness of visual observations for mitigation), through a reduction in the potential for interaction with the weapons firing activities associated with the use of applicable deployed targets.

#### 2.3.3.7 Swimmer Defense Activity Safety

A Notice to Mariners is issued in advance of all swimmer defense activities. Additional information on Notices to Mariners is provided in Section 3.12.2.1.1 (Sea Space). A daily in situ calibration of sound source levels is used to establish a clearance area to the 145 decibels referenced to 1 micropascal (dB re 1 µPa) sound pressure level threshold for non-participant safety. A hydrophone is used during the calibration sequences in order to confirm the clearance area. Small boats patrol the 145 dB re 1 µPa sound pressure level area during all activities. Boat crews are equipped with binoculars and remain vigilant for non-participant boats, swimmers, snorkelers, divers, and dive flags. If a non-participating swimmer, snorkeler, or diver is observed entering into the area of the swimmer defense system, the power levels of the defense system are reduced. An additional 100-yard buffer is applied to the initial sighting location of the non-participant as an additional precaution, and this buffer area is used to determine if the non-participant is within the 145 dB re 1 µPa zone. If the area cannot be maintained free of non-participating swimmers, snorkelers, and divers, the activity will cease until the non-participant has moved outside the area. These standard operating procedures benefit public health and safety (including persons participating in activities that have socioeconomic value, such as recreational diving) through a reduction in the potential for interaction with swimmer defense activities.

#### 2.3.3.8 Pierside Testing Safety

The *U.S. Navy Dive Manual* (U.S. Department of the Navy, 2011) prescribes safe distances for divers from active sonar sources and in-water explosions. Safety distances for the use of electromagnetic energy are specified in DoD Instruction 6055.11 (U.S. Department of Defense, 2009) and Military Standard 464A (U.S. Department of Defense, 2002). These distances are used as the standard safety buffers for in-water energy to protect Navy divers. If an unauthorized person is detected within the exercise area, the activity will be temporarily halted until the area is again cleared and secured. These standard operating procedures benefit public health and safety (including persons participating in activities that have socioeconomic value, such as commercial or recreational diving) through a reduction in the potential for interaction with pierside testing activities.

#### 2.3.3.9 Underwater Detonation Safety

Underwater detonation training takes place in designated areas that are located away from popular recreational dive sites, primarily for human safety. Recreational dive sites oftentimes include shallow-water coral reefs, artificial reefs, and shipwrecks. If an unauthorized person (e.g., a recreational diver) is detected within the exercise area, the activity will be temporarily halted until the area is cleared and secured. Notices to Mariners are issued when the events are scheduled to alert the public to stay clear of the area. Additional information on Notices to Mariners is provided in Section 3.12.2.1.1 (Sea Space). These standard operating procedures benefit public health and safety, environmental resources (e.g., shallow-water coral reefs, artificial reefs, and the biological resources that inhabit, shelter in, or

feed among them), and cultural resources (e.g., shipwrecks) through a reduction in the potential for interaction with underwater detonation activities.

### 2.3.3.10 Sonic Booms

As a general policy, aircraft do not intentionally generate sonic booms below 30,000 ft. of altitude unless over water and more than 30 mi. from inhabited land areas or islands. The Navy may authorize deviations from this policy for tactical missions; phases of formal training syllabus flights; or research, test, and operational suitability test flights. The standard operating procedures for sonic booms benefit public health and safety through a reduction in the potential for exposure to sonic booms.

### 2.3.3.11 Unmanned Aerial System, Surface Vehicle, and Underwater Vehicle Safety

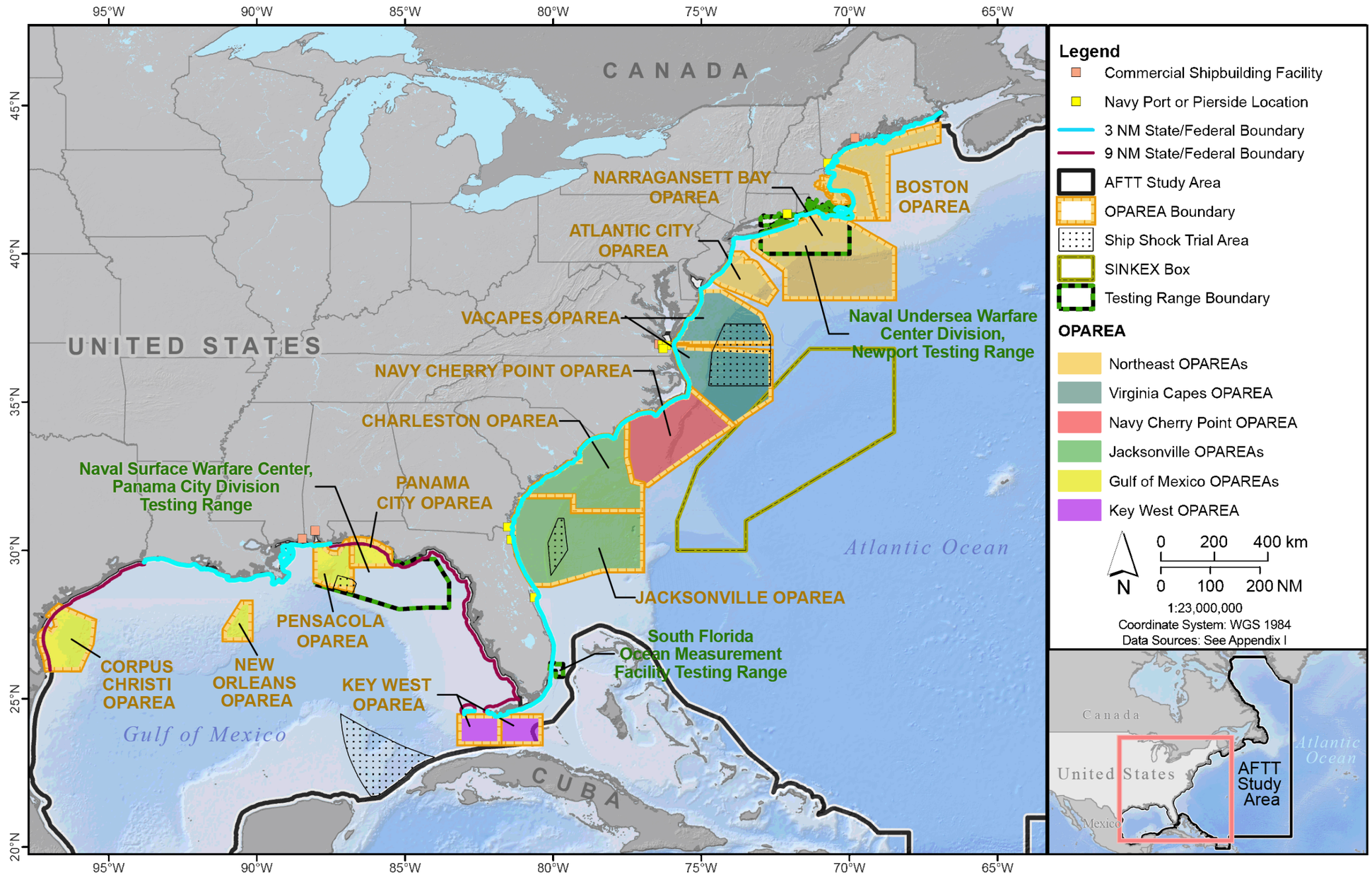
For activities involving unmanned aerial systems, surface vehicles, or underwater vehicles, the Navy evaluates the need to publish a Notice to Airmen or Notice to Mariners based on the scale, location, and timing of the activity. When necessary, Notices to Airmen and Notices to Mariners are issued to alert the public to stay clear of the area. Additional information is provided on Notices to Mariners in Section 3.12.2.1.1 (Sea Space) and Notices to Airmen in Section 3.12.2.1.2 (Airspace). Unmanned aerial systems are operated in accordance with Federal Aviation Administration air traffic organization policy as specified in Office of the Chief of Naval Operations Instructions 3710, 3750, and 4790. These standard operating procedures benefit public health and safety through a reduction in the potential for interaction with these unmanned systems and vehicles.

### 2.3.3.12 Towed In-Water Device Safety

As a standard collision avoidance procedure, prior to deploying a towed in-water device from a manned platform, the Navy searches the intended path of the device for any floating debris, objects, or animals (e.g., driftwood, concentrations of floating vegetation, marine mammals) that have the potential to obstruct or damage the device. This standard operating procedure benefits marine mammals, sea turtles, and vegetation through a reduction in the potential for physical disturbance and strike by a towed in-water device. Concentrations of floating vegetation can be indicators of potential marine mammal or sea turtle presence because marine mammals and sea turtles have been known to seek shelter in, feed on, or feed among them. For example, young sea turtles have been known to hide from predators and eat the algae associated with floating concentrations of *Sargassum.*

### 2.3.3.13 Ship Shock Trial Safety

The Navy may conduct ship shock trials in three designated areas within the Study Area (Figure 2.3-1). Notices to Mariners and Notices to Airmen are issued in advance of all ship shock trial activities to alert the public to stay clear of the area. Additional information is provided on Notices to Mariners in Section 3.12.2.1.1 (Sea Space) and Notices to Airmen in Section 3.12.2.1.2 (Airspace). An area with a 5-NM radius is established around the detonation point to exclude all non-participating vessels and aircraft. This area will be established 5 to 6 hours prior to each detonation and may continue post-detonation for a total exclusionary time of up to 12 hours. This area is an electronic emissions control zone that virtually eliminates the possibility of an inadvertent detonation caused by a radio or radar-induced electrical current in the explosive firing circuit. This area also provides for safe maneuvering of the explosive-laden operations vessel. Since the ship being tested and the operations vessel are not stationary during the ship shock trial activities, the associated area around the detonation point moves with the vessel. Ship shock trial activities are immediately stopped when a non-participating vessel or aircraft enters or is detected within the 5-NM clearance area. If a non-participating vessel or aircraft is detected within a 10-NM radius of ship shock trial activities, the




Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; SINKEX: Ship Sinking Exercises; VACAPES: Virginia Capes

**Figure 2.3-1: Coastal Zones and Designated Ship Shock Trial and Sinking Exercise Areas with Standard Operating Procedures**

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non-participant is warned to alter course. This is necessary for operational security and to allow large vessels sufficient time to change course to avoid entering the clearance area. These security measures continue until the area is clear of non-participating vessels and aircraft.

In the unlikely event a charge fails to explode, additional attempts to detonate the charge will be made. If detonation fails, the explosive will be recovered and disarmed. If the explosive cannot be detonated or disarmed, to safeguard human life, the explosive will be disposed at sea in accordance with established Ammunition and Explosives Safety Afloat requirements. The location of any disposal will be recorded. These standard operating procedures benefit public health and safety through a reduction in the potential for interaction with ship shock trial activities.

#### 2.3.3.14 Pile Driving Safety

Due to pile driving system design and operation, the Navy performs soft starts during impact installation of each pile to ensure proper operation of the diesel impact hammer. During a soft start, the Navy performs an initial set of strikes from the impact hammer at reduced energy before it can be operated at full power and speed. The energy reduction of an individual hammer cannot be quantified because it varies by individual driver. The number of strikes at reduced energy varies because raising the hammer at less than full power and then releasing it results in the hammer "bouncing" as it strikes the pile, which results in multiple "strikes." This standard operating procedure benefits marine mammals, sea turtles, and fish because soft starts may "warn" these resources and cause them to move away from the sound source before impact pile driving increases to full operating capacity.

#### 2.3.3.15 Sinking Exercise Safety

The Navy is required to conduct sinking exercises greater than 50 NM from land and in waters at least 6,000 ft. deep (40 CFR section 229.2). Within the Study Area, the Navy conducts sinking exercises only within a designated sinking exercise area, as depicted in Figure 2.3-1. The Navy selected the sinking exercise area to avoid established commercial air traffic routes, commercial vessel shipping lanes, and areas used for recreational activities, and to allow for the necessary separation of Navy units to ensure safety for Navy personnel, the public, commercial aircraft and vessels, and Navy assets. These standard operating procedures benefit public health and safety (including persons participating in activities that have socioeconomic value, such as recreational or commercial fishing) through a reduction in the potential for interaction with sinking exercises.

#### 2.3.3.16 Coastal Zone

As a matter of practice, the Navy does not typically conduct certain activities in the coastal zone due to specific mission requirements. The coastal zone extends 3 NM from shore everywhere in the Study Area except off Texas, the Florida Gulf coast, and Puerto Rico, where it extends 9 NM from shore. Training and testing activities that do not typically occur in the coastal zone are listed in Table 2.3-6 and Table 2.3-7, respectively. This standard operating procedure benefits public health and safety and the environmental and cultural resources that are located in the coastal zone through an avoidance of potential interaction with applicable activities.

## Table 2.3-6: Training Activities Typically Not Occurring in the Coastal Zone[1]

| *Air Warfare* |
|---|
| • Air Combat Maneuver[2] |
| • Air Defense Exercise |
| • Gunnery Exercises |
| o all Air-to-Air |
| o all Surface-to-Air |
| • Missile Exercises |
| o Air-to-Air |
| o Surface-to-Air |
| ***Amphibious Warfare*** |
| • Naval Surface Fire Support Exercise-At Sea |
| • Naval Surface Fire Support Exercise-Land Based Target |
| ***Anti-Submarine Warfare*** |
| • Torpedo Exercise |
| o Helicopter |
| o Maritime Patrol Aircraft |
| o Submarine |
| o Ship |
| • Tracking Exercise |
| o Helicopter |
| o Maritime Patrol Aircraft |
| o Submarine |
| o Ship |
| ***Integrated/Coordinated Anti-Submarine Warfare*** |
| • Anti-Submarine Warfare Tactical Development Exercise |
| • Group Sail |
| • Navy Undersea Warfare Training Assessment Course |
| • Surface Warfare Advanced Tactical Training |

| *Mine Warfare* |
|---|
| • Mine Detection |
| o Mine Countermeasure Exercise – Ship Sonar |
| • Mine Laying |
| o Aircraft |
| o Submarine launched |
| ***Surface Warfare*** |
| • Gunnery Exercises |
| o All Air-to-Surface |
| o All Surface-to-Surface |
| • Missile Exercise |
| o Air-to-Surface (Missile and Rocket) |
| o Surface-to-Surface |
| • Laser Targeting |
| o Aircraft |
| o Ship |
| • Integrated Live Fire |
| • Bombing Exercise |
| • Sinking Exercise[3] |
| ***Major Training Exercise*** |
| • Composite Training Unit Exercise |
| • Fleet Exercise/Sustainment Exercise |
| ***Other Training Activities*** |
| • Submarine Navigation |
| • Submarine Under Ice Certification |
| ***Electronic Warfare*** |
| • Counter Targeting |
| o Chaff-Aircraft |
| o Chaff-Ship |
| o Flare-Aircraft |

1 The coastal zone extends 3 NM from shore everywhere in the Study Area except off Texas, the Florida Gulf coast, and Puerto Rico, where it extends 9 NM from shore.

2 Air Combat Maneuver typically occurs outside the coastal zone, with an exception in the Key West Range Complex.

3 This activity only occurs in a designated area, which is located outside of the coastal zone.

## Table 2.3-7: Testing Activities Typically Not Occurring in the Coastal Zone[1]

| *Air Warfare* | *Surface Warfare* |
|---|---|
| • Air Combat Maneuver Test<br>• Air Platform Weapons Integration Test<br>• Air Platform-Vehicle Test<br>• Air-to-Air Weapons System Test<br>o Air-to-Air Gunnery Test – Medium-Caliber<br>o Air-to-Air Missile Test<br>• Intelligence, Surveillance, and Reconnaissance Test | • Air-to-Surface Bombing Test<br>• Air-to-Surface Gunnery Test<br>• Air-to-Surface Missile Test<br>• High-Energy Laser Weapons Test<br>• Laser Targeting Test<br>• Rocket Test<br>• Gun Testing – Large-Caliber<br>• Gun Testing – Medium-Caliber<br>• Gun Testing – Small-Caliber<br>• Kinetic Energy Weapon Testing<br>• Missile and Rocket Testing |
| ***Anti-Submarine Warfare*** | ***Other Testing Activities*** |
| • Anti-Submarine Warfare Torpedo Test<br>• Anti-Submarine Warfare Tracking Test – Helicopter<br>• Kilo Dip<br>• Sonobuoy Lot Acceptance Test<br>• Torpedo (Explosive) Testing[2]<br>• At-Sea Sonar Testing<br>• Anti-Submarine Warfare Tactical Development Exercise | • Air Platform Shipboard Integrate Test<br>• Maritime Security<br>• Shipboard Electronic Systems Evaluation<br>• Acoustic Component Testing<br>• Chemical and Biological Simulant Testing (coastal zone of Maine only)<br>• Hydrodynamic and Maneuverability Testing<br>• Signature Analysis Operations<br>• Acoustic and Oceanographic Research<br>• Emerging Mine Countermeasure Technology Research<br>• Large Displacement Unmanned Underwater Vehicle Testing |
| ***Electronic Warfare*** | ***Unmanned Systems*** |
| • Chaff Test<br>• Electronic Systems Evaluation<br>• Flare Test | • Underwater Search, Deployment, and Recovery |
| ***Mine Warfare*** | |
| • Mine Laying Test | |
| ***Vessel Evaluation*** | |
| • Aircraft Carrier Sea Trials – Propulsion Testing<br>• Air Defense Testing<br>• Propulsion Testing<br>• Surface Warfare Testing<br>• Small Ship Shock Trial[2]<br>• Large Ship Shock Trial[2]<br>• Submarine Sea Trials – Propulsion Testing<br>• Submarine Sea Trials – Weapons System Testing<br>• Total Ship Survivability Trials<br>• Non-Acoustic Component Testing | |

[1] The coastal zone extends 3 NM from shore everywhere in the Study Area except off Texas, the Florida Gulf coast, and Puerto Rico, where it extends 9 NM from shore.

[2] This activity only occurs in designated areas, which are located outside of the coastal zone.

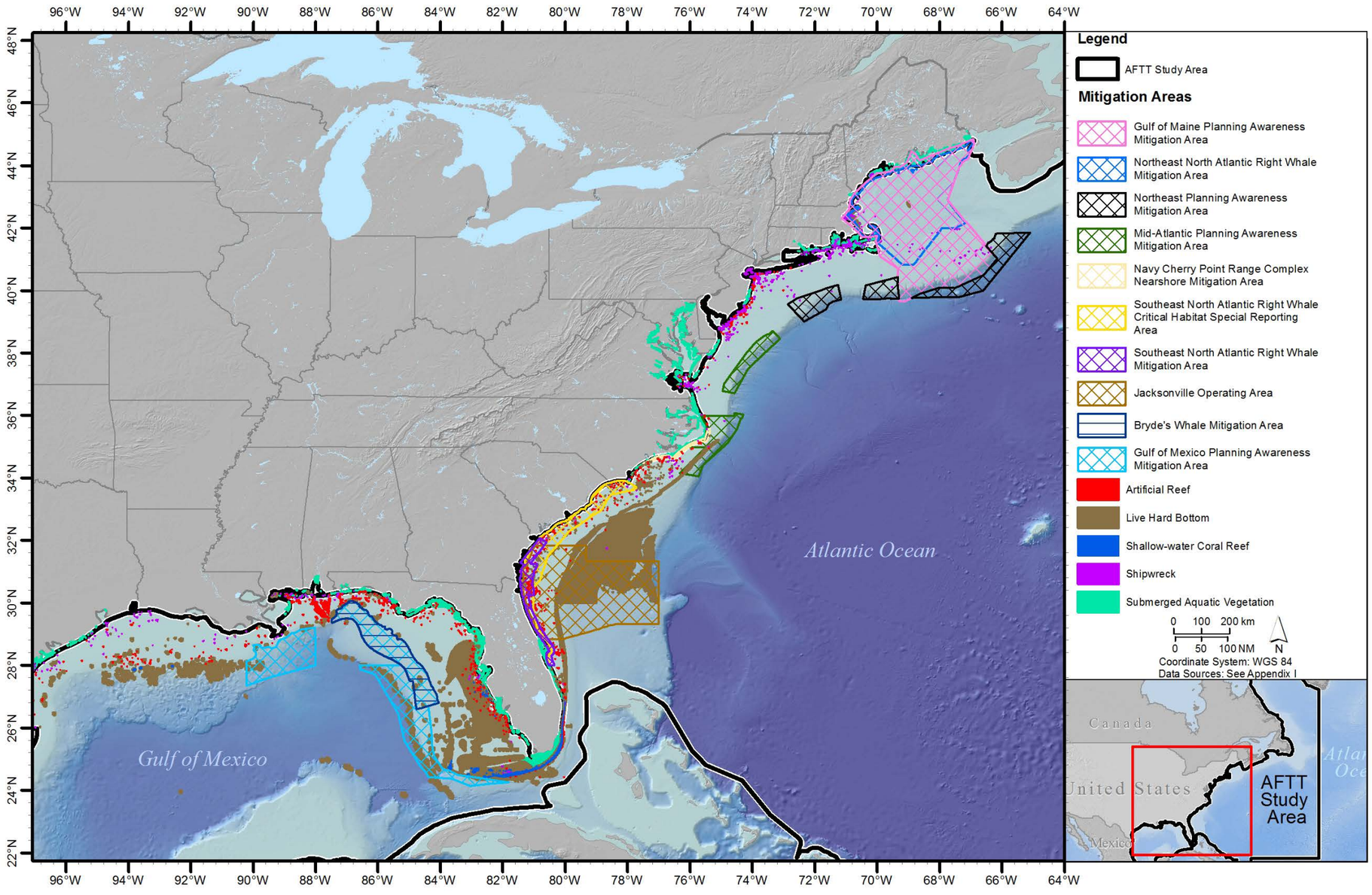
### 2.3.4 MITIGATION MEASURES

The Navy will implement mitigation measures to avoid or reduce potential impacts from the Proposed Action on environmental and cultural resources, some of which have high socioeconomic value in the Study Area. Mitigation measures that the Navy will implement under the Proposed Action are organized into two categories: procedural mitigation measures and mitigation areas. The Navy will implement procedural mitigation measures whenever and wherever applicable training or testing activities take place within the Study Area. Mitigation areas are geographic locations within the Study Area where the Navy will implement additional mitigation during all or part of the year.

A list of the activity categories, stressors, and geographic locations that have mitigation measures is provided in Table 2.3-8. Chapter 5 (Mitigation) provides a full description of each mitigation measure that will be implemented under the Proposed Action, including a discussion of how the Navy developed and assessed each measure and detailed maps of the mitigation area locations. Relevant mitigation details are also provided throughout Appendix A (Navy Activity Descriptions). The Navy and NMFS Records of Decision, MMPA Regulations and Letters of Authorization, and Endangered Species Act (ESA) Biological Opinion will document all mitigation measures that the Navy will implement under the Proposed Action.

**Table 2.3-8: Overview of Mitigation Categories**

| *Mitigation Category* | *Chapter 5 (Mitigation) Section* | *Applicable Activity Category, Stressor, or Mitigation Area Location* |
|---|---|---|
| Procedural Mitigation | Section 5.3.2 (Acoustic Stressors) | Active Sonar<br>Air Guns<br>Pile Driving<br>Weapons Firing Noise<br>Aircraft Overflight Noise |
| | Section 5.3.3 (Explosive Stressors) | Explosive Sonobuoys<br>Explosive Torpedoes<br>Explosive Medium-Caliber and Large-Caliber Projectiles<br>Explosive Missiles and Rockets<br>Explosive Bombs<br>Sinking Exercises<br>Explosive Mine Countermeasure and Neutralization Activities<br>Explosive Mine Neutralization Activities Involving Navy Divers<br>Maritime Security Operations – Anti-Swimmer Grenades<br>Line Charge Testing<br>Ship Shock Trials |
| | Section 5.3.4 (Physical Disturbance and Strike Stressors) | Vessel Movement<br>Towed In-Water Devices<br>Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions<br>Non-Explosive Missiles and Rockets<br>Non-Explosive Bombs and Mine Shapes |
| Mitigation Areas | Section 5.4 (Mitigation Areas to be Implemented) | Areas with Seafloor Resources<br>Areas off the Northeastern United States<br>Areas off the Mid-Atlantic and Southeastern United States<br>Areas in the Gulf of Mexico |




Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; SINKEX: Ship Sinking Exercises; VACAPES: Virginia Capes

**Figure 2.3-2: Summary of Mitigation Areas in the Study Area**

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## 2.4 ACTION ALTERNATIVE DEVELOPMENT

The identification, consideration, and analysis of alternatives are critical components of the National Environmental Policy Act (NEPA) process and contribute to the goal of objective decision-making. The Council on Environmental Quality issued regulations implementing NEPA, and these regulations require the decision maker to consider the environmental effects of the proposed action and a range of alternatives (including the no action alternative) to the proposed action (40 CFR section 1502.14). Council on Environmental Quality guidance further provides that an EIS must rigorously and objectively explore all reasonable alternatives for implementing the proposed action and, for alternatives eliminated from detailed study, briefly discuss the reasons for having been eliminated. To be reasonable, an alternative, except for the no action alternative, must meet the stated purpose of and need for the proposed action. An alternative that does not meet the stated purpose of and need for the proposed action is not considered reasonable.

The Action Alternatives, and in particular the mitigation measures that are incorporated in the Action Alternatives, were developed to meet both the Navy's purpose and need to train and test, and NMFS's independent purpose and need to evaluate the potential impacts of the Navy's activities, determine whether incidental take resulting from the Navy's activities will have a negligible impact on affected marine mammal species and stocks, and to prescribe measures to effect the least practicable adverse impact on species or stocks and their habitat, as well as monitoring and reporting requirements.

The Navy developed the alternatives considered in this EIS/OEIS after careful assessment by subject matter experts, including military commands that utilize the ranges, military range management professionals, and Navy environmental managers and scientists. The Navy also used new or updated military policy and historical data in developing alternatives.

For example, one military policy used to inform the alternatives development was the Optimized Fleet Response Plan, discussed in Section 1.4.2 (Optimized Fleet Response Plan), which changed how the Navy meets its readiness requirements. The data developed from the Optimized Fleet Response Plan inform the level of training, including the use of sonar sources and explosives, required by the Navy to meet its Title 10 responsibilities, which include maintaining, training, and equipping combat-ready forces. Additionally, during prior phases of comprehensive environmental planning, the Navy assumed that all unit-level sonar training requirements were met through independent training events, meaning each active sonar training requirement was analyzed as a discrete event. This was done for two reasons. First, there was insufficient data to determine if training requirements were being met through means other than live at-sea training, such as through the use of simulated training. Second, since these data were unavailable during prior phases of environmental planning, the Navy wanted to ensure it did not underestimate the potential effects of these activities when seeking MMPA/ESA permits, resulting in permits with insufficient authority to support the Navy's requirements. This could have resulted in the possibility of exceeding permit limits and resulted in non-compliance with the law.

Through the collection of several years of classified sonar use data, the Navy produced a more refined analysis of the amount of sonar usage that the Navy anticipates will be necessary to meet its training and testing requirements, which underlie the development of the action alternatives.

With regards to testing activities, as previously stated, the level of activity in any given year is highly variable and is dependent on technological advancements, emergent requirements identified during operations, and fiscal fluctuations. Therefore, the environmental analysis must consider all testing activities that could possibly occur to ensure that the analysis fully captures the potential environmental

effects. These factors were considered in alternatives carried forward for consideration and analyses as described in Section 2.5 (Alternatives Carried Forward).

### 2.4.1 TRAINING

The analysis of sonar use showed that ships are meeting their active sonar training requirements through a variety of methods. Ships are limited in the number of underway days that are available to conduct at-sea training during the training cycle due to training schedules and constrained fuel resources. Sailors are required to conduct a variety of unit-level training events, throughout all training phases to maintain readiness and conduct this training through a variety of methods, including simulators, unit-level live training at sea, and unit-level training accomplished in conjunction with other training exercises.

Simulators are sufficient to develop basic operator efficiency and can also be used for basic training of watch teams. While this does build proficiency, it cannot replicate the real-world complexities Sailors will have to deal with while deployed. Operating active sonar in the ocean is extremely complex due to numerous environmental factors that affect how sound travels through water, which cannot be realistically replicated. Only by training in the actual ocean environment can ship crews learn how to deal with these rapidly changing parameters and optimize their sensors to locate underwater objects such as submarines and mines. In summary, while simulators are an important tool for attaining and maintaining readiness, they cannot completely replace live training at sea.

To maximize training effectiveness during limited at-sea opportunities, the Navy takes advantage of training events that can meet multiple training requirements. For example, during an integrated or major training exercise that tracks a submarine with active sonar, units can also take credit for their unit-level training requirement to maintain proficiency in tracking submarines with active sonar. In previous environmental analyses, the Navy assumed that each requirement was met through independent training events. However, Navy's analysis has found that, in some instances, multiple requirements (i.e., unit level, integrated, and major training requirements) could be met during one activity. This ability to meet multiple requirements during one activity effectively reduces the number of times the activity needs to be conducted and, therefore, the sound energy transmitted into the water.

The Optimized Fleet Response Plan also influences the amount of active sonar transmitted during training. Under the prior Fleet Response Plan, as discussed in Section 1.4.2 (Optimized Fleet Response Plan), the Navy was required to be prepared to deploy eight carrier strike groups within 6 months. This meant that Navy units had to accomplish all training requirements from the basic phase through the integrated phase in a 6-month period. Although this level of training would occur if the Navy had to respond to a major national security crisis, this level of training has not been conducted in recent years. Instead, the Navy has been responding to significant but more regional challenges through scheduled deployments while still maintaining a stabilizing and continuous presence around the globe. From an environmental planning and permitting perspective, the combination of analyzing a year where world events require certification and deployment of eight carrier strike groups and repeating the maximum certification and deployment requirement every year resulted in the Navy's analyses and permits overestimating the number of training requirements. This also then overestimated the potential effects of that training over the 5-year MMPA incidental take authorization period. Up until this point, the current force structure (the number of ships, submarines, and aircraft) has resulted in significantly less active sonar use than what was analyzed in the previous environmental planning compliance documents and as reflected in the 2013–2018 permits. The Navy considered these data in developing the action alternatives.

### 2.4.2 TESTING

As described in Section 1.4.3 (Why the Navy Tests), there are multiple factors that make it challenging for the Navy to accurately predict future testing requirements. Testing conducted on past systems is not a reliable predictor of future testing duration and tempo, since testing requirements and funding can change. Also, testing of a given system does not occur on a predictable annual cycle but rather in discrete test phases that differ in duration and frequency. Some test phases are relatively short, up to a year, while others can take multiple years. The duration and timing of testing will vary depending on federal funding cycles and the success of past test events. The time, place, and details of future testing depend on scientific developments that are not easy to predict, and experimental designs may evolve with emerging science and technology. Even with these challenges, the Navy makes every effort to accurately forecast all future testing requirements.

In order to adequately support Navy testing requirements that are driven by the need to support fleet readiness, alternatives must have an annual capacity to conduct the research, development, and testing to support the following:

- new systems and new technologies
- upgrades to existing systems
- testing of existing systems after repair and maintenance activities
- lot acceptance testing of systems

Depending on emerging national security interests or threats to U.S. forces, the Navy may begin rapid development projects that were unanticipated at the time of initial environmental planning. Additionally, the potential that naval forces may need to quickly respond to world conflict or evolving threats may mean that sometimes technical evaluation and operational evaluation of a system could be expedited and occur in the same year. Therefore, the planning for future testing must accommodate these emergent requirements as much as possible. Based on these many uncertainties, the Navy's projected testing requirements and requested authorizations for testing within the AFTT Study Area provides the Navy the ability to test to a potential foreseeable annual maximum level. The maximum level is used in the analysis and authorization to ensure that Navy does not underestimate the potential impacts during the analysis. Consequently, Navy testing during any given year of an authorization timeframe can be less than the levels analyzed.

### 2.4.3 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Alternatives eliminated from further consideration are described below. The Navy determined that these alternatives did not meet the purpose of and need for the Proposed Action after a thorough consideration of each.

#### 2.4.3.1 Alternative Training and Testing Locations

Navy ranges have evolved over the decades and, considered together, allow for the entire spectrum of training and testing to occur in a given range complex or testing range. While some unit-level training and some testing activities may require only one training element (airspace, sea surface space, or undersea space), more advanced training and testing events may require a combination of air, surface, and undersea space as well as access to land ranges. The ability to utilize the diverse and multi-dimensional capabilities of each range complex or testing range allows the Navy to develop and maintain high levels of readiness. The Study Area, and the range complexes and testing ranges it

contains, has attributes necessary to support effective training and testing. No other locations match the Study Area attributes, which are as follows:

- proximity of range complexes and testing ranges off the east coast of the United States and within the Gulf of Mexico to each other
- proximity to the homeport regions of Norfolk, Virginia; Camp Lejeune in Jacksonville, North Carolina; and Jacksonville, Florida, as well as the Navy command headquarters, training schools, ships, submarines, aircraft squadrons, and Marine Corps forces located in each of those locations
- proximity to shore-based facilities, infrastructure, and the logistical support provided for testing activities
- proximity to military families, minimizing the length of time Sailors and Marines spend deployed away from home and benefitting overall readiness
- presence of unique training and testing ranges, which include the established mine warfare capabilities in the Virginia Capes Range Complex, the instrumented water ranges located at the South Florida Ocean Measurement Facility Testing Range, and naval training beaches located at Marine Corps Base Camp Lejeune capable of supporting large-scale amphibious training events
- environmental conditions (i.e., bathymetry, topography, and weather) found in the Study Area that maximize the training realism and testing effectiveness

The uniquely interrelated nature of the features and attributes of the range complexes and testing ranges located within the Study Area (as detailed in Section 2.1, Description of the Atlantic Fleet Training and Testing Study Area) provides the training and testing support needed for complex military activities. There is no other series of integrated ranges in the Atlantic Ocean that affords this level of operational support and comprehensive integration for range activities. There are no other potential locations in the Atlantic, where roughly half of the U.S. Navy's fleet is located, where land ranges, OPAREAs, undersea terrain and ranges, testing ranges, and military airspace combine to provide the venues necessary for the training and testing realism and effectiveness required to train and certify naval forces ready for combat operations.

#### 2.4.3.2 Simulated Training and Testing Only

The Navy currently uses simulation for training and testing whenever possible (e.g., command and control exercises are conducted without operational forces); however, there are significant limitations, and its use cannot replace live training or testing.

To detect and counter mine shapes and hostile submarines, the Navy uses both passive and active sonar. Sonar proficiency is a complex and perishable skill that requires regular, hands-on training in realistic and diverse conditions. More than 300 extremely quiet, newer-generation submarines are operated by more than 40 nations worldwide, and these numbers are growing. These difficult-to-detect submarines, as well as torpedoes and underwater mines, are true threats to global commerce, national security, and the safety of military personnel. As a result, defense against enemy submarines is a top priority for the Navy. Anti-submarine warfare training and testing activities include the use of active and passive sonar systems and small explosive charges, which prepare and equip Sailors for countering threats. Inability to train with sonar would eliminate or diminish anti-submarine warfare readiness. Failure to detect and defend against hostile submarines can cost lives, such as the 46 Sailors who lost

their lives when a Republic of Korea frigate (CHEONAN) was sunk by a North Korean submarine in March 2010.

There are limits to the realism that current simulation technology can presently provide. Unlike live training, computer-based training does not provide the requisite level of realism necessary to attain combat readiness. Today's simulation technology does not permit anti-submarine warfare training with the level of detail required to maintain proficiency. While simulators are used for the basic training of sonar technicians, they are of limited value beyond basic training. A simulator cannot match the dynamic nature of the environment, such as bathymetry and sound propagation properties, or the training activities involving several units with multiple crews interacting in a variety of acoustic environments.

Sonar operators must train regularly and frequently to develop and maintain the skills necessary to master the process of identifying underwater threats in the complex subsurface environment. Sole reliance on simulation would deny service members the ability to develop battle-ready proficiency in the employment of active sonar in the following areas:

- Bottom bounce and other environmental conditions. Sound hitting the ocean floor (bottom bounce) reacts differently depending on the bottom type and depth. Likewise, sound passing through changing currents, eddies, or across differences in ocean temperature, pressure, or salinity is also affected. Both of these are extremely complex and difficult to simulate, and both are common in actual sonar operations.
- Mutual sonar interference. When multiple sonar sources are operating in the vicinity of each other, interference due to similarities in frequency can occur. Again, this is a complex variable that must be recognized by sonar operators but is difficult to simulate with any degree of fidelity.
- Interplay between ship and submarine target. Ship crews, from the sonar operator to the ship's Captain, must react to the changing tactical situation with a real, thinking adversary (a Navy submarine for training purposes). Training in actual conditions with actual submarine targets provides a challenge that cannot be duplicated through simulation.
- Interplay between anti-submarine warfare teams in the strike group. Similar to the interplay required between ships and submarine targets, a ship's crew must react to all changes in the tactical situation, including changes from cooperating ships, submarines, and aircraft.

Similar to the challenges presented in the training situations above, operational testing cannot be based exclusively on computer modeling or simulation either (see 10 United States Code sections 2366 and 2399). At-sea testing provides the critical information on operability and supportability needed by the Navy to make decisions on the procurement of platforms and systems, ensuring that what is purchased performs as expected and that tax dollars are not wasted. This testing requirement is also critical to protecting the Sailors and Marines who depend on these technologies to execute their mission with minimal risk to themselves.

As the acquisition authority for the Navy, the Systems Commands are responsible for administering large contracts for the Navy's procurement of platforms and systems. These contracts include performance criteria and specifications that must be verified to ensure that the Navy accepts platforms and systems that support the warfighter's needs. Although simulation is a key component in platform and systems development, it does not adequately provide information on how a system will perform or whether it will be available to meet performance and other specification requirements because of the

complexity of the technologies in development and marine environments in which they will operate. For this reason, at some point in the development process, platforms and systems must undergo at-sea or in-flight testing. Therefore, simulation as an alternative that replaces training and testing in the field does not meet the purpose of and need for the Proposed Action and has been eliminated from detailed study.

#### 2.4.3.3 Training and Testing Without the Use of Active Sonar

As explained in Section 2.4.3.2 (Simulated Training and Testing Only), in order to detect and counter submerged mines and hostile submarines, the Navy uses both passive and active sonar. Sonar proficiency is a complex and perishable skill that requires regular, hands-on training in realistic and diverse conditions. Active sonar is needed to find and counter newer-generation submarines around the world, which are growing in number, as are torpedoes and underwater mines, which are true threats to global commerce, national security, and the safety of military personnel. As a result, defense against enemy submarines is a top priority for the Navy.

#### 2.4.3.4 Alternatives Including Geographic Mitigation Measures Within the Study Area

The Navy considered developing an alternative based solely on geographic mitigation that would impose time/area restrictions on an expanded list of specific areas in the AFTT Study Area associated with the presence of specific species. However, such an alternative would present a patchwork of areas and time periods in which the Navy could conduct required training and testing, preventing the Navy from conducting the full scope of activities necessary to fulfill its Title 10 responsibilities and running counter to the purpose and need of the Proposed Action. Thus, such an alternative would not be reasonable. Further, regulations governing NEPA allow agencies to "Include appropriate mitigation measures not already included in the proposed action or alternatives" (40 CFR 1502.14[f]). Under both action alternatives carried forward, the Navy would implement limited geographic mitigation areas that are biologically supported and practicable to implement. Such areas are more fully described in Chapter 5 (Mitigation). Therefore, appropriate mitigation protective of impacted species would be implemented regardless of the alternative selected.

## 2.5 ALTERNATIVES CARRIED FORWARD

The Navy's anticipated level of training and testing activity evolves over time based on numerous factors as discussed in the preceding paragraphs in Section 2.4 (Action Alternative Development). Additionally, over the past several years, the Navy's ongoing sonar reporting program has gathered classified data regarding the number of hull-mounted mid-frequency sonar hours used to meet anti-submarine warfare requirements, which has increased understanding of how sonar training hours are generated. These data allow for a more accurate projection of the number of active sonar hours required to meet anti-submarine warfare training requirements into the reasonably foreseeable future.

In light of this information, the Navy was able to better formulate a range of reasonable alternatives that meet Navy training requirements while reflecting a lower, and more realistic, impact on the environment. This analysis of ongoing activities also provides a more accurate assessment of the Navy's current impact on the environment from ongoing Navy training and testing when compared to the currently permitted activities.

As previously discussed, in addition to meeting Navy's purpose and need to train and test, the Action Alternatives, and in particular the mitigation measures that are incorporated in the Action Alternatives, were developed to meet NMFS's independent purpose and need to evaluate the potential impacts of the Navy's activities, determine whether incidental take resulting from the Navy's activities will have a

negligible impact on affected marine mammal species and stocks, and prescribe measures to effect the least practicable adverse impact on species or stocks and their habitat, as well as monitoring and reporting requirements.

### 2.5.1 NO ACTION ALTERNATIVE

As mentioned above in Section 2.4 (Action Alternative Development), the Council on Environmental Quality implementing regulations require that a range of alternatives to the proposed action, including a no action alternative, be analyzed to provide a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14). Council on Environmental Quality guidance identifies two approaches in developing the no action alternative (46 *Federal Register* 18026). One approach for activities that have been ongoing for long periods of time is for the No Action Alternative to be thought of in terms of continuing the present course of action or current management direction or intensity, such as the continuation of Navy training and testing at sea in the AFTT Study Area at current levels, even if separate legal authorizations under the MMPA and ESA are required. Under this approach, which was used in Phases I and II of the Navy's environmental planning and compliance program for training and testing activities at sea, the analysis compares the effects of continuing current activity levels (i.e., the "status quo") with the effects of the Proposed Action. The second approach depicts a scenario where no authorizations or permits are issued, the Navy's training and testing activities do not take place, and the resulting environmental effects from conducting no training or testing are compared with the effects of the Proposed Action. This approach is being applied in Phase III of the Navy's environmental planning and compliance program, including in this EIS/OEIS.

Under the No Action Alternative analyzed in this EIS/OEIS, the Navy would not conduct the proposed training and testing activities in the AFTT Study Area. Consequently, the No Action Alternative of not conducting the proposed live, at-sea training and testing in the AFTT Study Area is inherently unreasonable in that it does not meet the Navy's purpose and need (see Section 1.4, Purpose and Need) for the reasons noted in the next four paragraphs. However, the analysis associated with the No Action Alternative is carried forward in order to compare the magnitude of the potential environmental effects of the Proposed Action with the conditions that would occur if the Proposed Action did not occur (see Section 3.0, Introduction).

From NMFS's perspective, pursuant to its obligation to grant or deny permit applications under the MMPA, the No Action Alternative involves NMFS denying Navy's application for an incidental take authorization under section 101(a)(5)(A) of the MMPA. If NMFS were to deny the Navy's application, the Navy would not be authorized to incidentally take marine mammals in the AFTT Study Area, and under the No Action Alternative, as explained above, the Navy would not conduct the proposed training and testing activities in the AFTT Study Area.

Cessation of proposed Navy at-sea training and testing activities would mean that the Navy would not meet its statutory requirements and would be unable to properly defend itself and the United States from enemy forces, unable to successfully detect enemy submarines, and unable to effectively use its weapons systems or defensive countermeasures. Navy personnel would essentially not be taught how to use Navy systems in any realistic scenario. For example, sonar proficiency, which is a complex and perishable skill, requires regular, hands-on training in realistic and diverse conditions in order to detect and counter hostile submarines. Inability to train with active sonar would result in no or greatly diminished anti-submarine warfare capability.

Additionally, without proper training, individual Sailors and Marines serving onboard Navy vessels would not be taught how to properly operate complex equipment in inherently dynamic and dangerous environments. Even with high levels of training and a culture of safety, injuries and death have occurred during routine non-combat operations. Therefore, without proper training, it is likely that there would be an increase in the number of mishaps, potentially resulting in the death or serious injury of Sailors and Marines. Failing to allow our Sailors and Marines to achieve and maintain the skills necessary to defend the United States and its interests will result in an unacceptable increase in the danger they willingly face.

Finally, the lack of live training and testing would require a higher reliance on simulated training and testing. While the Navy continues to research new ways to provide realistic training through simulation, there are limits to the realism that current technology can provide. While simulators are used for the basic training of sonar technicians, they are of limited utility beyond basic training. A simulator cannot match the dynamic nature of the environment, such as bathymetry and sound propagation properties, or the training activities involving several units with multiple crews interacting in a variety of acoustic environments. Sole reliance on simulation would deny service members the ability to develop battle-ready proficiency in the employment of active sonar (Section 2.4.3.2, Simulated Training and Testing Only).

## 2.5.2 ALTERNATIVE 1

Alternative 1 is the Preferred Alternative.

### 2.5.2.1 Training

Under this alternative, the Navy proposes to conduct military readiness training activities into the reasonably foreseeable future, as necessary to meet current and future readiness requirements. These military readiness training activities include new activities as well as activities subject to previous analysis that are currently ongoing and have historically occurred in the Study Area. The requirements for the types of activities to be conducted, as well as the intensity at which they need to occur, have been validated by senior Navy leadership. Specifically, training activities are based on the requirements of the Optimized Fleet Response Plan and on changing world events, advances in technology, and Navy tactical and strategic priorities. These activities account for force structure changes and include training with new aircraft, vessels, unmanned/autonomous systems, and weapon systems that will be introduced to the fleets after November 2018. The numbers and locations of all proposed training activities are provided in Section 2.6.1 (Proposed Training Activities).

Alternative 1 reflects a representative year of training to account for the natural fluctuation of training cycles and deployment schedules that generally influence the maximum level of training that may occur year after year in any 5-year period. Using a representative level of activity, rather than a maximum tempo of training activity in every year, has reduced the amount of hull-mounted mid-frequency active sonar estimated to be necessary to meet training requirements, as discussed below. Both unit-level training and major training exercises are adjusted to meet this representative year, as discussed below.

Under Alternative 1, the Navy assumes that some unit-level training would be conducted using synthetic means (e.g., simulators). Additionally, this alternative assumes that some unit-level active sonar training will be completed through other training exercises. By using a representative level of training activity rather than a maximum level of training activity in every year, this alternative accepts a degree of risk that if global events necessitated a rapid expansion of military training that Navy would not have sufficient capacity in its MMPA and ESA authorizations to carry out those training requirements.

The Optimized Fleet Response Plan and various training plans identify the number and duration of training cycles that could occur over a 5-year period. Alternative 1 considers fluctuations in training cycles and deployment schedules that do not follow a traditional annual calendar but instead are influenced by in-theater demands and other external factors. Similar to unit-level training, this alternative does not analyze a maximum number carrier strike group Composite Training Unit Exercises (one type of major exercise) every year but instead assumes a maximum number of exercises would occur during 2 years of any 5-year period. As a result, Alternative 1 will analyze a maximum of 3 Composite Training Unit Exercises in any given year and not more than 12 over any 5-year period. This alternative does not provide for the conduct of a contingency Composite Training Unit Exercise in the Gulf of Mexico and, hence, incorporates a degree of risk that the Navy will not have sufficient capacity in potential MMPA permits to support the full spectrum of training potentially necessary to respond to a future national emergency crisis.

This risk associated with the Preferred Alternative was deemed acceptable by the Commander of all Naval forces in the Study Area based on training requirements needed to meet the current geopolitical environment. The acceptance of this risk was contingent on using the best available science to conduct a thorough analysis of impacts from Alternative 2, including annual maximum levels of unit-level active sonar hours, Composite Training Unit Exercises, and contingency Composite Training Unit Exercises in the Gulf of Mexico.

#### 2.5.2.2 Testing

Alternative 1 entails a level of testing activities to be conducted into the reasonably foreseeable future, with adjustments that account for changes in the types and tempo (increases or decreases) of testing activities to meet current and future military readiness requirements. This alternative includes the testing of new platforms, systems, and related equipment that will be introduced after November 2018. The majority of testing activities that would be conducted under this alternative are the same as or similar as those conducted currently or in the past. This alternative includes the testing of some new systems using new technologies and takes into account inherent uncertainties in this type of testing.

Under Alternative 1, the Navy proposes an annual level of testing that reflects the fluctuations in testing programs by recognizing that the maximum level of testing will not be conducted each year. This alternative contains a more realistic annual representation of activities, but includes years of a higher maximum amount of testing to account for these fluctuations. This alternative would not include the contingency for augmenting some weapon system tests, which would increase levels of annual testing of anti-submarine warfare and mine warfare systems, and presumes a typical level of readiness requirements. The numbers and locations of all proposed testing activities are provided in Section 2.1.1 (Proposed Testing Activities).

#### 2.5.2.3 Mitigation Measures

The Navy's entire suite of mitigation measures was developed in coordination with NMFS and applied to Alternative 1 to ensure that (1) the benefit of mitigation measures to environmental and cultural resources was considered during the applicable environmental analyses and (2) Navy senior leadership approved each mitigation measure that would be implemented under Alternative 1. Navy senior leadership reviewed relevant supporting information to make a fully informed decision, including the benefit of mitigation measures to environmental and cultural resources and the impacts that mitigation will have on training and testing activities under Alternative 1. As discussed in Chapter 5 (Mitigation), the mitigation measures represent the maximum level of mitigation that the Navy can implement after

consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activities.

## 2.5.3 ALTERNATIVE 2

### 2.5.3.1 Training

As under Alternative 1, this alternative includes new and ongoing activities. Under Alternative 2, training activities are based on requirements established by the Optimized Fleet Response Plan. Under this alternative, the Navy would be enabled to meet the highest levels of required military readiness by conducting the majority of its training live at sea and by meeting unit-level training requirements using dedicated, discrete training events, instead of combining them with other training activities as described for Alternative 1. The numbers and locations of all proposed training activities are provided in Section 2.6.1 (Proposed Training Activities), Table 2.6-1.

Alternative 2 reflects the maximum number of training activities that could occur within a given year and assumes that the maximum level of activity would occur every year over any 5-year period. This allows for the greatest capacity for the Navy to maintain readiness when considering potential changes in the national security environment, fluctuations in training and deployment schedules, and potential in-theater demands. Both unit-level training and major training exercises are assumed to occur at a maximum level every year.

Additionally, this alternative will analyze 3 Composite Training Unit Exercises each year along with a contingency Composite Training Unit Exercise in the Gulf of Mexico each year, for a total number of 20 Composite Training Unit Exercises, including the Gulf of Mexico contingency Composite Training Unit Exercise, over any 5-year period.

### 2.5.3.2 Testing

Like Alternative 1, Alternative 2 entails a level of testing activities to be conducted into the reasonably foreseeable future and includes the testing of new platforms, systems, and related equipment that will be introduced beginning in November 2018. The majority of testing activities that would be conducted under this alternative are the same as or similar to those conducted currently or in the past.

Alternative 2 would include the testing of some new systems using new technologies, taking into account the potential for delayed or accelerated testing schedules, variations in funding availability, and innovations in technology development. To account for these inherent uncertainties in testing, this alternative assumes that the maximum annual testing efforts predicted for each individual system or program could occur concurrently in any given year. This alternative also includes the contingency for augmenting some weapon systems tests in response to potential increased world conflicts and changing Navy leadership priorities as the result of a direct challenge from a naval opponent that possesses near-peer capabilities. Therefore, this alternative includes the provision for higher levels of annual testing of certain anti-submarine warfare and mine warfare systems to support expedited delivery of these systems to the fleet. All proposed testing activities are listed in Table 2.6-2 through Table 2.6-4, Section 2.6 (Proposed Training and Testing Activities for Both Alternatives).

### 2.5.3.3 Mitigation Measures

The Navy's entire suite of mitigation measures was developed in coordination with NMFS and applied to Alternative 1 to ensure that (1) the benefit of mitigation measures to environmental and cultural resources was considered during the applicable environmental analyses and (2) Navy senior leadership approved each mitigation measure that would be implemented under Alternative 1. Navy senior

leadership reviewed relevant supporting information to make a fully informed decision, including the benefit of mitigation measures to environmental and cultural resources and the impacts that mitigation will have on training and testing activities under Alternative 1. As discussed in Chapter 5 (Mitigation), the mitigation measures represent the maximum level of mitigation that the Navy can implement after consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activities.

## 2.5.4 Comparison of Proposed Sonar and Explosive Use in the Action Alternatives to the 2013–2018 MMPA Permit Allotment

### 2.5.4.1 Training

As a comparison to the amount of training analyzed in the previous environmental planning compliance documents and as reflected in the 2013–2018 MMPA permit (Phase II), the Navy considered the type of sonar source that resulted in the greatest number of exposures to marine mammals, which was identified as hull-mounted mid-frequency active sonar. The differences between use of this system from Phase II to Phase III are best identified in three ways: (1) completion of unit-level training via synthetic means or through other training exercises, (2) reduction of sonar hours associated with a Composite Training Unit Exercise, and (3) reduction in the number of Composite Training Unit Exercises expected over a 5-year period.

During Phase II, all unit-level training using hull-mounted mid-frequency sonar was assumed to be conducted during discrete training events. However, current practice indicates that some unit-level training is completed through synthetic training, as well as concurrent with other training exercises (e.g., unit-level training can be completed simultaneously during the conduct of an integrated training exercise). Alternative 1 accounts for the use of synthetic training and concurrent unit-level training within other exercises, although this assumes risk in the event additional live training is necessary. To preserve the ability for the Navy to conduct all unit-level sonar training as discrete, at-sea exercises, Alternative 2 does not provide for the reduction in hours for this type of activity.

Composite Training Unit Exercises are major exercises that involve multiple platforms and numerous hours of sonar to meet mission objectives. During Phase II, each Composite Training Unit Exercise was assumed to require 1,000 hours of hull-mounted mid-frequency sonar. Through analysis of data collected during the Phase II permit period, the Navy determined that this assumption overestimated the amount of hull-mounted mid-frequency sonar that was typically used in a Composite Training Unit Exercise by 400 hours. As such, for both Alternatives 1 and 2, an estimated 600 hours of hull-mounted mid-frequency sonar is included for each Composite Training Unit Exercise.

Comparisons of proposed hull-mounted mid-frequency sonar hours to the hours permitted from 2013 to 2018 are depicted in Figure 2.5-1 and Figure 2.5-2.

The Fleet Response Plan, in place during Phase II, identified a requirement to conduct four Composite Training Unit Exercises per year along the U.S. East Coast, and a contingency Composite Training Unit Exercise in the Gulf of Mexico was also included, resulting in a total of five exercises analyzed per year. For Phase III, the number of Composite Training Unit Exercises to be conducted is reduced, with fewer proposed exercises in Alternative 1 and Alternative 2. Alternative 1 reduces the number of Composite Training Unit Exercises to be conducted during any 5-year period along the east coast from the 2013–2018 permitted level by analyzing representative years (in addition to maximum planned years) of training activity to account for the variability of training cycles and deployment schedules. Alternative 1 analysis includes no more than 12 Composite Training Unit Exercises over any 5-year period into the

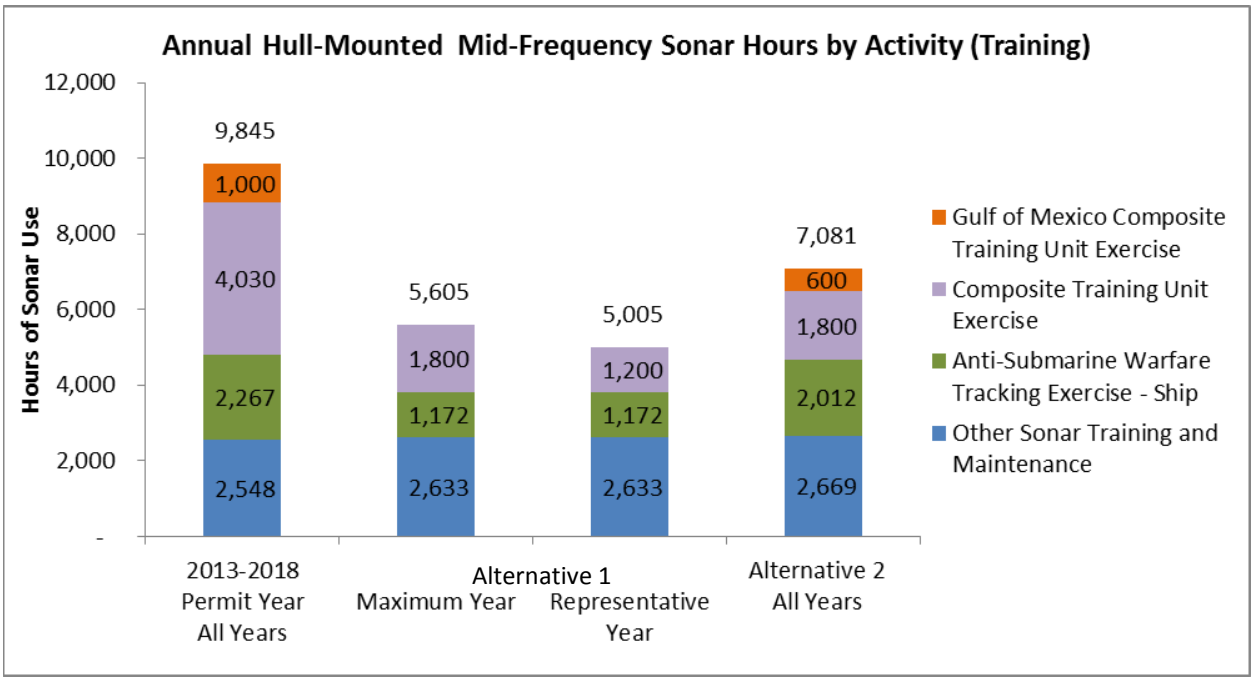



**Figure 2.5-1: Proposed Maximum Year of Hull-Mounted Mid-Frequency Sonar Hour Use by Activity During Training Compared to the Number Authorized in the 2013–2018 Marine Mammal Protection Act Permit**

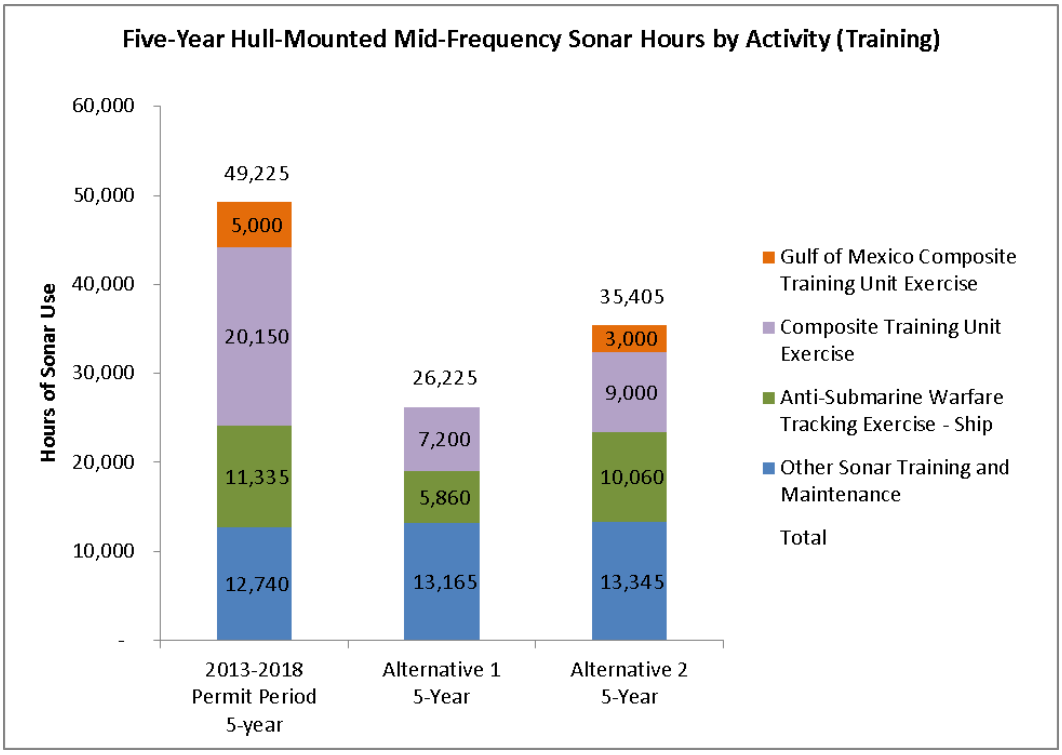



**Figure 2.5-2: Proposed Five-Year Total Hull-Mounted Mid-Frequency Sonar Hour Use by Activity During Training Compared to the Number Authorized in the 2013–2018 Marine Mammal Protection Act Permit**

foreseeable future. Alternative 2 analyzes a maximum number of Composite Training Unit Exercises planned per year (three) along the east coast and a contingency exercise in the Gulf of Mexico every year in a 5-year period. As such, Alternative 2 provides for 4 Composite Training Unit Exercises each year, for a total of 20 over a 5-year period. A comparison of the number of Composite Training Unit Exercises from the 2013–2018 permitted levels to the action alternatives is provided in Figure 2.5 3.

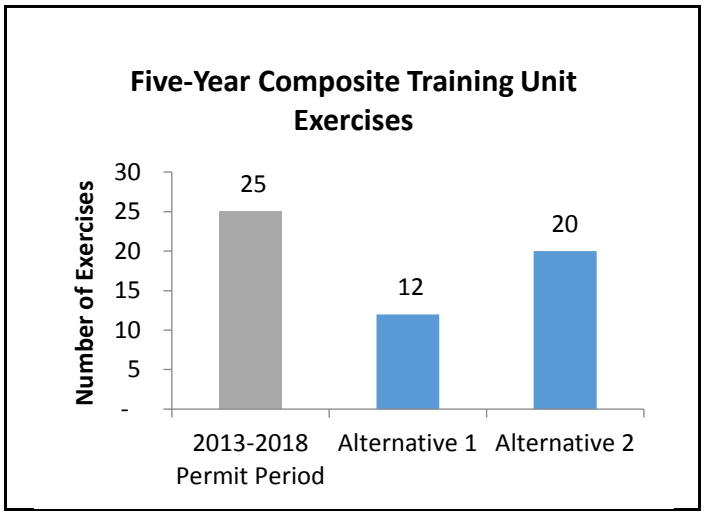
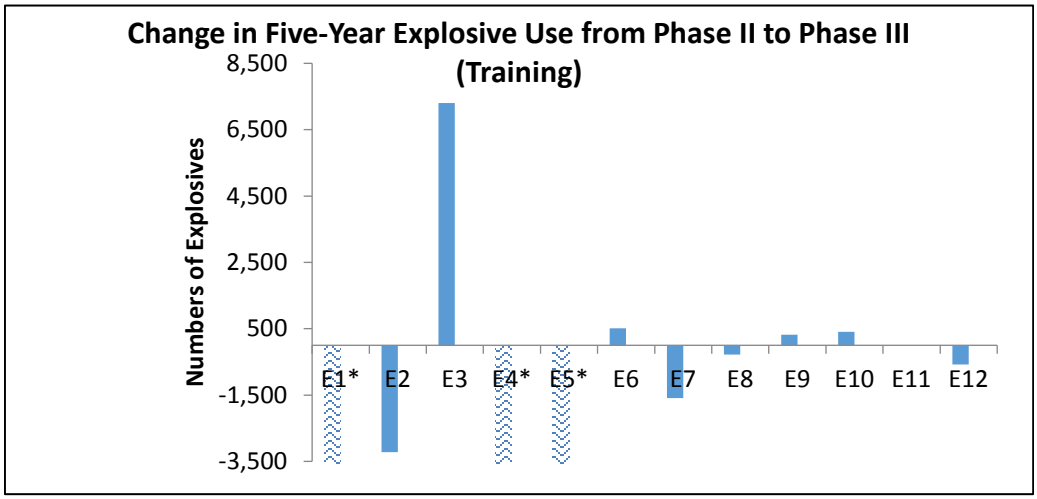



**Figure 2.5-3: Proposed Number of Composite Training Unit Exercises over a Five-Year Period Compared to Number Authorized in the 2013–2018 Marine Mammal Protection Act Permit**

After analyzing the level of explosive activities conducted during Phase II, the Navy identified that some explosive sources were incorrectly classed into bins with greater net explosive weights than are actually present in the munitions (see Section 3.0.3.3.2.1, Explosions in Water, for a discussion of explosive classification bins). For example, 20-millimeter rounds were considered in bin E1 during Phase II, but have less than 0.1 pound of net explosive weight (defined as bin E0) and are, therefore, analyzed qualitatively instead of quantitatively for Phase III. Additionally in Phase II, munitions within the same category were all analyzed with the highest net explosive weight for all munitions in that category. For example, most bombs were analyzed as bin E12 to account for the largest potential for environmental impact, whereas many fall within bins E9 and E10. For Phase III, munitions were divided into more appropriate bins based on current and anticipated weapon inventory. Due to the re-binning of multiple munitions, comparing the use of a single bin or type of explosive (similar to the comparison above for sonar) is not prudent. Figure 2.5-4 provides the change in explosive use per bin for all training activities between the 2013–2018 permitted level and the two action alternatives.

### 2.5.4.2 Testing

As described in Sections 1.4.3.2 (Methods of Testing), 2.5.2.2 (Testing), and 2.5.3.2 (Testing), the Navy's testing community faces a number of challenges in accurately defining future testing requirements. These challenges include varying funding availability, changes in Congressional and DoD/Navy priorities in response to emerging threats in the world, and the acquisition of new technologies that introduce increased uncertainties in the timeline, tempo, or success of a system's testing schedule. As it does now, the Navy testing community took into account these same challenges in projecting requirements for the 2013–2018 (Phase II) testing timeframe. Although the best information available to the Navy has always been taken into account, as a result of the implementation of Phase II, the Navy testing community has improved its ability to obtain and define that information and, consequently, its ability to project future testing needs. It is expected that over time, the Navy's ability to project future testing requirements will continue to improve with increasing refinement of the process and more or better historical data. Nonetheless, the inherent challenges and uncertainties in testing, as described previously, will continue to make projection of future testing requirements challenging.




* Bin E1 decreased by 571,060 explosives, bin E4 decreased by 10,303 explosives, and bin E5 decreased by 51,150 explosives. These bins cannot be represented in this graph without distorting the scale.
1 Alternative 1 and Alternative 2 would use the same number of explosives in Phase III; bar graph depicts both alternatives.
2 As the graph indicates the change in explosive use, the 2013–2018 permitted level is represented as the "0" line, to which the change for Phase III is compared, such that positive values are an increase in use of the bin and negative values are a decrease in use of that bin.

**Figure 2.5-4: Change in Explosive Use (for Both Action Alternatives) During Training Activities Compared to the 2013–2018 Marine Mammal Protection Act Permit[1, 2]**

The majority of platforms, weapons, and systems that were proposed for testing during the Phase II timeframe are the same or very similar to those proposed to be tested in the future. However, the Navy projects that the need to test some platforms, weapons, and systems will increase, while others will decrease, as compared to the testing requirements that were proposed for the Phase II timeframe. Overall, the Navy is projecting a net increase in the need to test systems that use sonar and a net decrease for explosives use, as proposed under Alternative 1 and as compared to the proposed testing requirements of the Phase II timeframe. These future projections are based on improvements in the Navy's understanding of requirements, the completion of test phases of certain projects since Phase II, the addition of test phases anticipated to start after December 2018, and the projected testing of new types of equipment since the 2013–2018 timeframe.

## 2.6 Proposed Training and Testing Activities for Both Alternatives

### 2.6.1 Proposed Training Activities

All proposed training activities are listed in Table 2.6-1. It should be noted that many of the activities listed occur the same number of time annually under both alternatives. These activities can be thought of as meeting individual training requirements. Although the number of some activities may be the same, the difference between the alternatives is manifest in how these activities are conducted. This difference is explained above in Section 2.5 (Alternatives Carried Forward) and represented in Figure 2.5-1 and Figure 2.5-2.

## Table 2.6-1: Proposed Training Activities per Alternative

| *Activity Name* | *Annual # of Activities*[a] | | *5-Year # of Activities* | | *Location*[b] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| ***Major Training Exercise – Large Integrated Anti-Submarine Warfare*** | | | | | |
| Composite Training Unit Exercise | 2–3 | 3 | 12 | 15 | VACAPES RC<br>Navy Cherry Point RC<br>JAX RC |
| | 0 | 1 | 0 | 5 | GOMEX |
| ***Major Training Exercise – Medium Integrated Anti-Submarine Warfare*** | | | | | |
| Fleet Exercise/Sustainment Exercise | 2 | | 10 | | VACAPES RC |
| | 4 | | 20 | | JAX RC |
| ***Integrated/Coordinated Training*** | | | | | |
| Small Integrated Anti-Submarine Training | 6 | | 30 | | JAX RC |
| | 3 | | 15 | | Navy Cherry Point RC |
| | 3 | | 15 | | VACAPES RC |
| Medium Coordinated Anti-Submarine Warfare Training | 2 | | 10 | | JAX RC |
| | 1 | | 5 | | Navy Cherry Point RC |
| | 1 | | 5 | | VACAPES RC |
| Small Coordinated Anti-Submarine Warfare Training | 4 | | 20 | | JAX RC |
| | 5 | | 25 | | Navy Cherry Point RC |
| | 5 | | 25 | | VACAPES RC |
| ***Air Warfare*** | | | | | |
| Air Combat Maneuver | 1,270 | | 6,350 | | JAX RC |
| | 6,300 | | 31,500 | | Key West RC |
| | 1,155 | | 5,775 | | Navy Cherry Point RC |
| | 1,200 | | 6,000 | | VACAPES RC |
| Air Defense Exercise | 85 | | 425 | | GOMEX RC |
| | 5,157 | | 25,785 | | JAX RC |
| | 5,166 | | 25,830 | | Navy Cherry Point RC |
| | 3,425 | | 17,125 | | VACAPES RC |
| Gunnery Exercise Air-to-Air Medium-Caliber | 75 | | 375 | | JAX RC |
| | 70 | | 350 | | Key West RC |
| | 40 | | 200 | | Navy Cherry Point RC |
| | 120 | | 600 | | VACAPES RC |
| Gunnery Exercise Surface-to-Air Large Caliber | 7 | | 35 | | JAX RC |
| | 25 | | 125 | | VACAPES RC |
| Gunnery Exercise Surface-to-Air Medium Caliber | 10 | | 50 | | Other AFTT Areas[1] |
| | 31 | | 155 | | JAX RC |
| | 23 | | 115 | | Navy Cherry Point RC |
| | 59 | | 295 | | VACAPES RC |
| Missile Exercise Air-to-Air | 48 | | 240 | | JAX RC |
| | 8 | | 40 | | Key West RC |
| | 48 | | 240 | | Navy Cherry Point RC |
| | 40 | | 200 | | VACAPES RC |
| Missile Exercise Surface-to-Air | 2 | | 10 | | GOMEX RC |
| | 5 | | 20 | | JAX RC |
| | 2 | | 10 | | Navy Cherry Point RC |
| | 2 | | 10 | | Northeast RC |
| | 30 | | 50 | | VACAPES RC |

## Table 2.6-1: Proposed Training Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[a] | | *5-Year # of Activities* | | *Location*[b] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Missile Exercise – Man-Portable Air Defense System | 5 | | 25 | | Navy Cherry Point RC |
| ***Amphibious Warfare*** | | | | | |
| Amphibious Assault | 5 | | 25 | | Navy Cherry Point RC |
| Amphibious Marine Expeditionary Unit Integration Exercise | 1 | | 5 | | Navy Cherry Point RC |
| Amphibious Raid | 20 | | 100 | | JAX RC |
| | 34 | | 162 | | Navy Cherry Point RC |
| Amphibious Ready Group Marine Expeditionary Unit Exercise | 1 | | 5 | | Navy Cherry Point RC |
| Amphibious Vehicle Maneuvers | 186 | | 930 | | VACAPES RC |
| | 2 | | 10 | | JAX RC |
| Humanitarian Assistance Operations | 1 | | 5 | | Navy Cherry Point RC |
| Marine Expeditionary Unit Certification Exercise | 5 | | 25 | | Navy Cherry Point RC |
| Naval Surface Fire Support Exercise – At Sea | 4 | | 20 | | GOMEX |
| | 12 | | 60 | | JAX RC |
| | 2 | | 10 | | Navy Cherry Point RC |
| | 38 | | 190 | | VACAPES RC |
| Naval Surface Fire Support Exercise – Land–Based Target | 13 | | 65 | | Navy Cherry Point RC |
| ***Anti-Submarine Warfare*** | | | | | |
| Anti-Submarine Warfare Torpedo Exercise – Helicopter | 14 | | 70 | | JAX RC |
| | 4 | | 20 | | VACAPES RC |
| Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft | 14 | | 70 | | JAX RC |
| | 4 | | 20 | | VACAPES RC |
| Anti-Submarine Warfare Torpedo Exercise – Ship | 16 | | 80 | | JAX RC |
| | 5 | | 25 | | VACAPES RC |
| Anti-Submarine Warfare Torpedo Exercise – Submarine | 12 | | 60 | | JAX RC |
| | 6 | | 30 | | Northeast RC |
| | 2 | | 10 | | VACAPES RC |
| Anti-Submarine Warfare Tracking Exercise – Helicopter | 24 | | 120 | | Other AFTT Areas |
| | 370 | | 1,850 | | JAX RC |
| | 12 | | 60 | | Navy Cherry Point RC |
| | 8 | | 40 | | VACAPES RC |
| Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft | 90 | | 450 | | Northeast RC |
| | 176 | | 880 | | VACAPES RC |
| | 525 | | 2,625 | | JAX RC |
| | 46 | | 230 | | Navy Cherry Point RC |
| | 5[c] | 5 | 25[c] | 25 | Northeast RC |

## Table 2.6-1: Proposed Training Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[a] | | *5-Year # of Activities* | | *Location*[b] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Anti-Submarine Warfare Tracking Exercise – Ship | 110[c] | 110 | 550[c] | 550 | Other AFTT Areas |
| | 5[c] | 5 | 25[c] | 25 | GOMEX RC |
| | 440[c] | 440 | 2,200[c] | 2,200 | JAX RC |
| | 55[c] | 55 | 275[c] | 275 | Navy Cherry Point RC |
| | 220[c] | 220 | 1,100[c] | 1,100 | VACAPES RC |
| Anti-Submarine Warfare Tracking Exercise – Submarine | 44 | | 220 | | Other AFTT Areas |
| | 13 | | 65 | | JAX RC |
| | 1 | | 5 | | Navy Cherry Point RC |
| | 18 | | 90 | | Northeast RC |
| | 6 | | 30 | | VACAPES RC |
| ***Electronic Warfare*** | | | | | |
| Counter Targeting Chaff Exercise – Aircraft | 18 | | 90 | | GOMEX RC |
| | 2,990 | | 14,950 | | JAX RC |
| | 3,000 | | 15,000 | | Key West RC |
| | 1,610 | | 8,050 | | Navy Cherry Point RC |
| | 130 | | 650 | | VACAPES RC |
| Counter Targeting Chaff Exercise – Ship | 5 | | 25 | | GOMEX RC |
| | 5 | | 25 | | JAX RC |
| | 5 | | 25 | | Navy Cherry Point RC |
| | 50 | | 250 | | VACAPES RC |
| Counter Targeting Flare Exercise | 92 | | 460 | | GOMEX RC |
| | 1,900 | | 9,500 | | JAX RC |
| | 1,550 | | 7,750 | | Key West RC |
| | 1,115 | | 5,575 | | Navy Cherry Point RC |
| | 50 | | 250 | | VACAPES RC |
| Electronic Warfare Operations | 181 | | 905 | | JAX RC |
| | 2,620 | | 13,100 | | Navy Cherry Point RC |
| | 302 | | 1,510 | | VACAPES RC |
| High-Speed Anti-Radiation Missile Exercise | 4 | | 20 | | JAX RC |
| | 10 | | 50 | | Navy Cherry Point RC |
| | 11 | | 55 | | VACAPES RC |
| ***Expeditionary Warfare*** | | | | | |
| Dive and Salvage Operations | 16 | | 80 | | GOMEX RC |
| | 60 | | 300 | | JAX RC |
| | 8 | | 40 | | Key West RC |
| | 16 | | 80 | | Navy Cherry Point RC |
| | 30 | | 150 | | VACAPES RC |
| Maritime Security Operations – Anti-Swimmer Grenades | 2 | | 10 | | GOMEX RC |
| | 2 | | 10 | | JAX RC |
| | 2 | | 10 | | Navy Cherry Point RC |
| | 4 | | 20 | | Northeast RC |
| | 5 | | 25 | | VACAPES RC |
| Personnel Insertion/ Extraction – Air | 10 | | 50 | | JAX RC |
| | 10 | | 50 | | Key West |
| | 2,164 | | 10,820 | | VACAPES RC |
| | 2 | | 10 | | Northeast RC |

## Table 2.6-1: Proposed Training Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[a] | | *5-Year # of Activities* | | *Location*[b] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Personnel Insertion/ Extraction – Surface and Subsurface | 5 | | 25 | | GOMEX RC |
| | 1 | | 5 | | JAX RC |
| | 360 | | 1,800 | | VACAPES RC |
| Personnel Insertion/ Extraction – Swimmer/Diver | 42 | | 210 | | VACAPES RC |
| Underwater Construction Team Training | 8 | | 40 | | GOMEX RC |
| | 4 | | 20 | | JAX RC |
| | 4 | | 20 | | Key West RC |
| | 8 | | 40 | | VACAPES RC |
| ***Mine Warfare*** | | | | | |
| Airborne Mine Countermeasure – Mine Detection | 66 | | 330 | | GOMEX RC |
| | 317 | | 1,585 | | JAX RC |
| | 371 | | 1,855 | | Navy Cherry Point RC |
| | 244 | | 1,220 | | NSWC Panama City |
| | 1,540 | | 7,700 | | VACAPES RC |
| Airborne Mine Countermeasures – Towed Mine Neutralization | 50 | | 250 | | GOMEX RC |
| | 100 | | 500 | | JAX RC |
| | 108 | | 540 | | Navy Cherry Point RC |
| | 510 | | 2,550 | | VACAPES RC |
| Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercise | 1 | | 3 | | Beaumont, TX<br>Boston, MA<br>Corpus Christi, TX<br>Delaware Bay, DE<br>Earle, NJ<br>GOMEX RC<br>Hampton Roads, VA<br>JAX RC<br>Kings Bay, GA<br>NS Mayport<br>Morehead City, NC<br>Port Canaveral, FL<br>Savannah, GA<br>Tampa, FL<br>VACAPES RC<br>Wilmington, NC |
| Coordinated Unit Level Helicopter Airborne Mine Countermeasure Exercise | 2 | | 10 | | GOMEX RC |
| | 2 | | 10 | | JAX RC |
| | 2 | | 10 | | Navy Cherry Point RC |
| | 2 | | 10 | | VACAPES RC |
| Mine Countermeasures – Mine Neutralization – Remotely Operated Vehicle | 132 | | 660 | | GOMEX RC |
| | 71 | | 355 | | JAX RC |
| | 71 | | 355 | | Navy Cherry Point RC |
| | 630 | | 3,150 | | VACAPES RC |
| Mine Countermeasures – Ship Sonar | 22 | | 110 | | GOMEX RC |
| | 53 | | 265 | | JAX RC |
| | 53 | | 265 | | VACAPES RC |

## Table 2.6-1: Proposed Training Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[a] | | *5-Year # of Activities* | | *Location*[b] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Mine Laying | 1 | | 5 | | JAX RC |
| | 2 | | 10 | | Navy Cherry Point RC |
| | 4 | | 20 | | VACAPES RC |
| Mine Neutralization – Explosive Ordnance Disposal | 6 | | 30 | | Lower Chesapeake Bay |
| | 16 | | 80 | | GOMEX RC |
| | 20 | | 100 | | JAX RC |
| | 17 | | 85 | | Key West RC |
| | 16 | | 80 | | Navy Cherry Point RC |
| | 524 | | 2,620 | | VACAPES RC |
| Underwater Mine Countermeasures Raise, Tow, Beach, and Exploitation Operations | 56 | | 280 | | GOMEX RC |
| | 78 | | 390 | | JAX RC |
| | 8 | | 40 | | Key West RC |
| | 24 | | 120 | | Navy Cherry Point RC |
| | 446 | | 2,230 | | VACAPES RC |
| ***Surface Warfare*** | | | | | |
| Bombing Exercise Air-to-Surface | 67 | | 335 | | GOMEX RC |
| | 434 | | 2,170 | | JAX RC |
| | 108 | | 540 | | Navy Cherry Point RC |
| | 329 | | 1645 | | VACAPES RC |
| Fast Attack Craft and Fast Inshore Attack Craft Exercise | 25 | | 125 | | JAX RC |
| | 25 | | 125 | | VACAPES RC |
| Gunnery Exercise Air-to-Surface Medium-Caliber | 30 | | 150 | | GOMEX RC |
| | 495 | | 2,475 | | JAX RC |
| | 395 | | 1,975 | | Navy Cherry Point RC |
| | 720 | | 3,600 | | VACAPES RC |
| Gunnery Exercise Air-to-Surface Small-Caliber | 200 | | 1,000 | | JAX RC |
| | 130 | | 650 | | Navy Cherry Point RC |
| | 560 | | 2,800 | | VACAPES RC |
| Gunnery Exercise Surface-to-Surface Boat Medium-Caliber | 6 | | 30 | | GOMEX RC |
| | 26 | | 130 | | JAX RC |
| | 128 | | 640 | | Navy Cherry Point RC |
| | 2 | | 10 | | Northeast RC |
| | 260 | | 1,300 | | VACAPES RC |
| Gunnery Exercise Surface-to-Surface Boat Small-Caliber | 67 | | 335 | | GOMEX RC |
| | 84 | | 420 | | JAX RC |
| | 92 | | 460 | | Navy Cherry Point RC |
| | 18 | | 90 | | Northeast RC |
| | 330 | | 650 | | VACAPES RC |
| Gunnery Exercise Surface-to-Surface Ship Large-Caliber | 10 | | 50 | | Other AFTT Areas |
| | 9 | | 45 | | GOMEX RC |
| | 51 | | 255 | | JAX RC |
| | 35 | | 175 | | Navy Cherry Point RC |
| | 75 | | 375 | | VACAPES RC |

## Table 2.6-1: Proposed Training Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[a] | | *5-Year # of Activities* | | *Location*[b] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Gunnery Exercise Surface-to-Surface Ship Medium-Caliber | 41 | | 205 | | Other AFTT Areas |
| | 33 | | 165 | | GOMEX RC |
| | 161 | | 805 | | JAX RC |
| | 72 | | 360 | | Navy Cherry Point RC |
| | 321 | | 1,605 | | VACAPES RC |
| Gunnery Exercise Surface-to-Surface Ship Small-Caliber | 50 | | 250 | | Other AFTT Areas |
| | 10 | | 50 | | GOMEX RC |
| | 300 | | 1,500 | | JAX RC |
| | 20 | | 100 | | Navy Cherry Point RC |
| | 450 | | 2,250 | | VACAPES RC |
| Integrated Live Fire Exercise | 2 | | 10 | | JAX RC |
| | 2 | | 10 | | VACAPES RC |
| Laser Targeting – Aircraft | 315 | | 1,575 | | JAX RC |
| | 272 | | 1,360 | | VACAPES RC |
| Laser Targeting – Ship | 4 | | 20 | | JAX RC |
| | 4 | | 20 | | VACAPES RC |
| Maritime Security Operations | 59 | | 245 | | GOMEX RC |
| | 210 | | 1,050 | | JAX RC |
| | 75 | | 375 | | Navy Cherry Point RC |
| | 13 | | 65 | | Northeast RC |
| | 895 | | 4,475 | | VACAPES RC |
| Missile Exercise Air-to-Surface | 102 | | 510 | | JAX RC |
| | 52 | | 260 | | Navy Cherry Point RC |
| | 88 | | 440 | | VACAPES RC |
| Missile Exercise Air-to-Surface – Rocket | 10 | | 50 | | GOMEX RC |
| | 102 | | 510 | | JAX RC |
| | 10 | | 50 | | Navy Cherry Point RC |
| | 92 | | 460 | | VACAPES RC |
| Missile Exercise Surface-to-Surface | 16 | | 80 | | JAX RC |
| | 12 | | 60 | | VACAPES RC |
| Sinking Exercise | 1 | | 5 | | SINKEX Box |
| ***Other Training Activities*** | | | | | |
| Elevated Causeway System | 1 | | 5 | | Lower Chesapeake Bay |
| | 1 | | 5 | | Navy Cherry Point RC |
| Precision Anchoring | 9 | | 45 | | GOMEX RC |
| | 231 | | 1,155 | | JAX RC |
| | 710 | | 3,550 | | VACAPES RC |
| Search and Rescue | 776 | | 3,880 | | JAX RC |
| | 1,176 | | 5,880 | | VACAPES RC |
| Submarine Navigation | 169 | | 845 | | NSB New London |
| | 3 | | 15 | | NSB Kings Bay |
| | 3 | | 15 | | NS Mayport |
| | 84 | | 420 | | NS Norfolk |
| | 23 | | 115 | | Port Canaveral, FL |

## Table 2.6-1: Proposed Training Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[a] | | *5-Year # of Activities* | | *Location*[b] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Submarine Sonar Maintenance | 12 | | 60 | | Other AFTT Areas |
| | 66 | | 330 | | NSB New London |
| | 9 | | 45 | | JAX RC |
| | 2 | | 10 | | NSB Kings Bay |
| | 34 | | 170 | | NS Norfolk |
| | 86 | | 430 | | Northeast RC |
| | 2 | | 10 | | Port Canaveral, FL |
| | 13 | | 63 | | Navy Cherry Point RC |
| | 47 | | 233 | | VACAPES RC |
| Submarine Under Ice Certification | 3 | | 15 | | JAX RC |
| | 3 | | 15 | | Navy Cherry Point RC |
| | 9 | | 45 | | Northeast RC |
| | 9 | | 45 | | VACAPES RC |
| Surface Ship Object Detection | 76 | | 380 | | NS Mayport |
| | 162 | | 810 | | NS Norfolk |
| Surface Ship Sonar Maintenance | 0 | 18 | 0 | 90 | Other AFTT Areas |
| | 0 | 18 | 0 | 90 | JAX RC |
| | 50 | | 250 | | NS Mayport |
| | 120 | | 600 | | Navy Cherry Point RC |
| | 235 | | 1,175 | | NS Norfolk |
| | 120 | | 600 | | VACAPES RC |
| Waterborne Training | 42 | | 210 | | GOMEX RC |
| | 55 | | 275 | | JAX RC |
| | 141 | | 705 | | Northeast RC |
| | 110 | | 550 | | VACAPES RC |

[a] For activities where the maximum number of events varies between years, a range is provided to indicate the "representative–maximum" number of events. For activities where no variation is anticipated, only the maximum number of events within a single year is provided.

[b] Locations given are areas where activities typically occur. However, activities could be conducted in other locations within the Study Area. Where multiple locations are provided within a single cell, the number of activities could occur in any of the locations, not in each of the locations.

[c] For anti-submarine warfare tracking exercise – Ship, Alternative 1, 50 percent of requirements are met through synthetic training or other training exercises.

[1] Other AFTT Areas include areas outside of range complexes and testing ranges but still within the AFTT Study Area. Other AFTT Area activities typically refer to those activities that occur while vessels are in transit.

Notes: AFTT: Atlantic Fleet Training and Testing; Alt: Alternative; NS: Naval Station; NSB: Naval Submarine Base; NSWC: Naval Surface Warfare Center; GOMEX: Gulf of Mexico; JAX: Jacksonville; RC: Range Complex; SINKEX: sinking exercises; VACAPES: Virginia Capes

## 2.6.2 PROPOSED TESTING ACTIVITIES

All proposed testing activities are listed in Table 2.6-2 through Table 2.6-4.

**Table 2.6-2: Naval Air Systems Command Proposed Testing Activities per Alternative**

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| ***Air Warfare*** | | | | | |
| Air Combat Maneuver Test | 550 | | 2,750 | | VACAPES RC |
| Air Platform Weapons Integration Test | 40 | | 200 | | VACAPES RC |
| Air Platform-Vehicle Test | 12 | | 60 | | GOMEX RC |
| | 9 | | 45 | | JAX RC |
| | 9 | | 45 | | Key West RC |
| | 9 | | 45 | | Navy Cherry Point RC |
| | 190 | | 950 | | VACAPES RC |
| Air-to-Air Weapons System Test | 10 | | 50 | | GOMEX RC |
| Air-to-Air Gunnery Test – Medium-Caliber | 55 | | 275 | | VACAPES RC |
| Air-to-Air Missile Test | 83 | | 415 | | VACAPES RC |
| Intelligence, Surveillance, and Reconnaissance Test | 7 | | 35 | | JAX RC |
| | 9 | | 45 | | Navy Cherry Point RC |
| | 406 | | 2,030 | | VACAPES RC |
| ***Anti-Submarine Warfare*** | | | | | |
| Anti-Submarine Warfare Torpedo Test | 20–43 | 43 | 146 | 215 | JAX RC |
| | 40–121 | 121 | 362 | 605 | VACAPES RC |
| Anti-Submarine Warfare Tracking Test – Helicopter | 4–6 | 6 | 24 | 30 | GOMEX RC |
| | 0–12 | 12 | 24 | 60 | JAX RC |
| | 2–27 | 26-27 | 35 | 131 | Key West RC |
| | 28–110 | 110 | 304 | 550 | Northeast RC |
| | 137–280 | 280 | 951 | 1,400 | VACAPES RC |
| Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft | 10–15 | 15 | 60 | 75 | GOMEX RC |
| | 19 | 24 | 95 | 120 | JAX RC |
| | 10–12 | 12 | 54 | 60 | Key West RC |
| | 14–15 | 16 | 72 | 80 | Navy Cherry Point RC |
| | 36–45 | 48 | 198 | 240 | Northeast RC |
| | 25 | 26 | 125 | 130 | VACAPES RC |
| Kilo Dip | 2–6 | 6 | 14 | 30 | GOMEX RC |
| | 0–6 | 6 | 6 | 30 | JAX RC |
| | 0–6 | 6 | 6 | 30 | Key West RC |
| | 0–4 | 4 | 8 | 20 | Northeast RC |
| | 20–40 | 40 | 140 | 200 | VACAPES RC |
| Sonobuoy Lot Acceptance Test | 160 | | 800 | | Key West RC |

## Table 2.6-2: Naval Air Systems Command Proposed Testing Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| ***Electronic Warfare*** | | | | | |
| Chaff Test | 20 | | 100 | | GOMEX RC |
| | 4 | | 20 | | JAX RC |
| | 24 | | 120 | | VACAPES RC |
| Electronic Systems Evaluation | 2 | | 10 | | JAX RC |
| | 61 | | 305 | | VACAPES RC |
| Flare Test | 10 | | 50 | | GOMEX RC |
| | 20 | | 100 | | VACAPES RC |
| ***Mine Warfare*** | | | | | |
| Airborne Dipping Sonar Minehunting Test | 16–32 | 32 | 96 | 160 | NSWC Panama City |
| | 6–18 | 18 | 42 | 90 | VACAPES RC |
| Airborne Laser Based Mine Detection System Test | 40 | | 200 | | NSWC Panama City |
| | 50 | | 250 | | VACAPES RC |
| Airborne Mine Neutralization System Test | 20–27 | 32 | 107 | 160 | NSWC Panama City |
| | 25–45 | 50 | 145 | 250 | VACAPES RC |
| Airborne Sonobuoy Minehunting Test | 52 | | 260 | | NSWC Panama City |
| | 24 | | 120 | | VACAPES RC |
| Mine Laying Test | 1 | | 5 | | JAX RC |
| | 2 | | 10 | | VACAPES RC |
| ***Surface Warfare*** | | | | | |
| Air-to-Surface Bombing Test | 20 | | 100 | | VACAPES RC |
| Air-to-Surface Gunnery Test | 25–55 | 55 | 215 | 275 | JAX RC |
| | 110–140 | 140 | 640 | 700 | VACAPES RC |
| Air-to-Surface Missile Test | 0–10 | 10 | 20 | 50 | GOMEX RC |
| | 29–38 | 38 | 167 | 190 | JAX RC |
| | 117–148 | 148 | 663 | 740 | VACAPES RC |
| High-Energy Laser Weapons Test | 108 | | 540 | | VACAPES RC |
| Laser Targeting Test | 5 | | 25 | | VACAPES RC |
| Rocket Test | 15–19 | 19 | 87 | 95 | JAX RC |
| | 31–35 | 35 | 167 | 175 | VACAPES RC |
| ***Other Testing Activities*** | | | | | |
| Undersea Range System Test | 4–20 | | 42 | | JAX RC |
| Acoustic and Oceanographic Research | 1 | | 5 | | GOMEX RC |
| | 1 | | 5 | | JAX RC |
| | 1 | | 5 | | Key West RC |
| | 1 | | 5 | | Northeast RC |
| | 1 | | 5 | | VACAPES RC |

## Table 2.6-2: Naval Air Systems Command Proposed Testing Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Air Platform Shipboard Integrate Test | 126 | | 630 | | VACAPES RC |
| Maritime Security | 12 | | 60 | | JAX RC |
| | 12 | | 60 | | Navy Cherry Point RC |
| | 20 | | 100 | | VACAPES RC |
| Shipboard Electronic Systems Evaluation | 24 | | 120 | | GOMEX RC |
| | 24 | | 120 | | JAX RC |
| | 24 | | 120 | | Key West RC |
| | 26 | | 130 | | VACAPES RC |

[1] For activities where the maximum number of events varies between years, a range is provided to indicate the "representative–maximum" number of events. For activities where no variation is anticipated, only the maximum number of events within a single year is provided.

[2] Locations given are areas where activities typically occur. However, activities could be conducted in other locations within the Study Area.

Notes: Alt: Alternative; GOMEX: Gulf of Mexico; JAX: Jacksonville; NSWC: Naval Surface Warfare Center; RC: Range Complex; VACAPES: Virginia Capes

## Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| ***Anti-Submarine Warfare*** | | | | | |
| Anti-Submarine Warfare Mission Package Testing | 42 | | 210 | | JAX RC |
| | 4 | | 20 | | Newport, RI |
| | 4 | | 20 | | NUWC Newport |
| | 26 | | 130 | | VACAPES RC |
| At-Sea Sonar Testing | 2 | | 10 | | JAX RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |
| | 1 | | 5 | | JAX RC<br>Navy Cherry Point RC<br>VACAPES RC |
| | 2 | | 10 | | Offshore Fort Pierce, FL<br>GOMEX RC<br>JAX RC<br>SFOMF<br>Northeast RC<br>VACAPES |
| | 4 | | 20 | | JAX RC |
| | 2 | | 10 | | Navy Cherry Point RC |
| | 8 | | 40 | | NUWC Newport |
| | 12 | | 60 | | VACAPES RC |
| Countermeasure Testing | 5 | | 25 | | GOMEX RC<br>Key West RC<br>JAX RC<br>NUWC Newport<br>VACAPES RC |
| | 2–4 | | 14 | | GOMEX RC<br>JAX RC<br>Northeast RC<br>VACAPES RC |
| Pierside Sonar Testing | 1 | | 5 | | NSB New London<br>NS Norfolk<br>Port Canaveral, FL |
| | 11 | | 55 | | Bath, ME |
| | 5 | | 25 | | NSB New London |
| | 4 | | 20 | | NSB Kings Bay |
| | 8 | | 40 | | Newport, RI |
| | 13 | | 65 | | NS Norfolk |
| | 2 | | 10 | | Pascagoula, MS |
| | 3 | | 15 | | Port Canaveral, FL |
| | 2 | | 10 | | PNS |
| Submarine Sonar Testing/Maintenance | 16 | | 80 | | Norfolk, VA |
| | 24 | | 120 | | PNS |

## Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Surface Ship Sonar Testing/Maintenance | 1 | | 5 | | JAX RC |
| | 1 | | 5 | | NS Mayport |
| | 3 | | 15 | | NS Norfolk |
| | 3 | | 15 | | VACAPES RC |
| Torpedo (Explosive) Testing | 4 | | 20 | | GOMEX RC<br>Offshore Fort Pierce, FL<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |
| | 2 | | 10 | | GOMEX RC<br>JAX RC<br>Northeast RC<br>VACAPES RC |
| Torpedo (Non-Explosive) Testing | 7 | | 35 | | GOMEX RC |
| | 11 | | 55 | | Offshore Fort Pierce, FL |
| | 2 | | 8 | | JAX RC |
| | 7 | | 35 | | Navy Cherry Point RC |
| | 8 | | 38 | | Northeast RC |
| | 30 | | 150 | | NUWC Newport |
| | 11 | | 55 | | VACAPES RC |
| ***Electronic Warfare*** | | | | | |
| Radar and Other System Testing | 6–10 | | 34 | | GOMEX RC<br>JAX RC<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>NSWC Panama City<br>NUWC Newport<br>SFOMF<br>VACAPES RC |
| | 4 | | 20 | | NSB New London |
| | 0–3 | | 3 | | JEB LC-FS<br>NS Norfolk |
| | 2 | | 10 | | NS Norfolk |
| | 2 | | 10 | | Northeast RC |
| | 21–45 | | 129 | | VACAPES RC |
| ***Mine Warfare*** | | | | | |
| Mine Countermeasure and Neutralization Testing | 13 | | 65 | | NSWC Panama City |
| | 6 | | 30 | | VACAPES RC |
| Mine Countermeasure Mission Package Testing | 19 | | 95 | | GOMEX RC |
| | 10 | | 50 | | JAX RC |
| | 11 | | 55 | | NSWC Panama City |
| | 2 | | 10 | | SFOMF |
| | 5 | | 25 | | VACAPES RC |

## Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Mine Detection and Classification Testing | 6 | | 30 | | GOMEX RC |
| | 10 | | 50 | | Navy Cherry Point RC |
| | 47–55 | | 250 | | NSWC Panama City |
| | 7–12 | | 43 | | Riviera Beach, FL |
| | 4 | | 20 | | SFOMF |
| | 3 | | 15 | | VACAPES RC |
| ***Surface Warfare*** | | | | | |
| Gun Testing – Large-Caliber | 12 | | 60 | | GOMEX RC<br>JAX RC<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |
| | 1 | | 5 | | GOMEX RC |
| | 1 | | 5 | | JAX RC |
| | 1 | | 5 | | Key West RC |
| | 1 | | 5 | | Navy Cherry Point RC |
| | 1 | | 5 | | Northeast RC |
| | 33 | | 165 | | NSWC Panama City |
| | 5 | | 25 | | VACAPES RC |
| Gun Testing – Medium-Caliber | 12 | | 60 | | GOMEX RC<br>JAX RC<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |
| | 102 | | 510 | | NSWC Panama City |
| | 5 | | 24 | | VACAPES RC |
| Gun Testing – Small-Caliber | 24 | | 120 | | GOMEX RC<br>JAX RC<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |
| | 13 | | 65 | | GOMEX RC |
| | 7 | | 35 | | NSWC Panama City |
| | 8 | | 40 | | VACAPES RC |
| Kinetic Energy Weapon Testing | 61 | | 301 | | GOMEX RC<br>JAX RC<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |

## Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Missile and Rocket Testing | 13 | | 65 | | GOMEX RC<br>JAX RC<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |
| | 1 | | 5 | | GOMEX RC |
| | 2 | | 10 | | JAX RC |
| | 5 | | 25 | | Northeast RC |
| | 22 | | 110 | | VACAPES RC |
| ***Unmanned Systems*** | | | | | |
| Underwater Search, Deployment, and Recovery | 33 | | 165 | | SFOMF |
| Unmanned Aerial System Testing | 15 | | 75 | | Northeast RC |
| | 17 | | 85 | | NUWC Newport |
| | 15 | | 75 | | VACAPES RC |
| Unmanned Surface Vehicle System Testing | 132 | | 660 | | NUWC Newport |
| Unmanned Underwater Vehicle Testing | 16 | | 80 | | GOMEX RC<br>JAX RC<br>NUWC Newport |
| | 41 | | 205 | | GOMEX RC |
| | 25 | | 125 | | JAX RC |
| | 145–146 | | 727 | | NSWC Panama City |
| | 308–309 | | 1,541 | | NUWC Newport |
| | 9 | | 45 | | Riviera Beach, FL |
| | 42 | | 210 | | SFOMF |
| ***Vessel Evaluation*** | | | | | |
| Aircraft Carrier Sea Trials – Propulsion Testing | 2 | | 10 | | VACAPES RC |
| Air Defense Testing | 1 | | 5 | | GOMEX RC |
| | 2 | | 10 | | JAX RC |
| | 1 | | 5 | | Northeast RC |
| | 5 | | 25 | | VACAPES RC |
| Hydrodynamic and Maneuverability Testing | 2 | | 10 | | GOMEX RC<br>JAX RC<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |
| In-Port Maintenance Testing | 24 | | 120 | | NS Mayport<br>NS Norfolk |
| | 2 | | 10 | | NS Mayport |
| | 5 | | 25 | | NS Norfolk |

## Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Large Ship Shock Trial | 0-1 | | 1 | | GOMEX RC<br>JAX RC<br>VACAPES RC |
| Propulsion Testing | 34 | | 170 | | GOMEX RC<br>JAX RC<br>Key West RC<br>Navy Cherry Point RC<br>Northeast RC<br>VACAPES RC |
| | 86 | | 430 | | Gulf of Mexico |
| | 2 | | 10 | | JAX RC |
| | 6 | | 30 | | Navy Cherry Point RC |
| | 5 | | 25 | | Northeast RC |
| | 7 | | 35 | | VACAPES RC |
| Signature Analysis Operations | 1 | | 5 | | JAX RC |
| | 59 | | 295 | | SFOMF |
| Small Ship Shock Trial | 0–3 | | 3 | | JAX RC<br>VACAPES RC |
| Surface Warfare Testing | 2 | | 10 | | GOMEX RC |
| | 13 | | 65 | | JAX RC |
| | 1 | | 5 | | Key West RC |
| | 10 | | 50 | | Northeast RC |
| | 9 | | 45 | | VACAPES RC |
| Submarine Sea Trials – Propulsion Testing | 1 | | 5 | | JAX RC |
| | 1 | | 5 | | Northeast RC |
| | 1 | | 5 | | VACAPES RC |
| Submarine Sea Trials – Weapons System Testing | 2 | | 10 | | Offshore Fort Pierce, FL<br>GOMEX RC<br>JAX RC<br>SFOMF<br>Northeast RC<br>VACAPES RC |
| | 4 | | 20 | | JAX RC |
| | 4 | | 20 | | Northeast RC |
| | 4 | | 20 | | VACAPES RC |
| Total Ship Survivability Trials | 0–1 | | 1 | | JAX RC<br>VACAPES RC |
| Undersea Warfare Testing | 2 | | 10 | | JAX RC<br>VACAPES RC |
| | 0–2 | | 4 | | JAX RC<br>Navy Cherry Point RC<br>SFOMF<br>VACAPES RC |
| | 2 | | 10 | | GOMEX RC |
| | 6 | | 30 | | JAX RC |
| | 2 | | 10 | | VACAPES RC |

## Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

| *Activity Name* | *Annual # of Activities*[1] | | *5-Year # of Activities* | | *Location*[2] |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| Vessel Signature Evaluation | 9 | | 45 | | JAX RC<br>VACAPES RC |
| | 2 | | 10 | | GOMEX RC |
| | 16 | | 80 | | JAX RC |
| | 5 | | 25 | | JEB LC-FS |
| | 18 | | 90 | | VACAPES RC |
| ***Other Testing Activities*** | | | | | |
| Insertion/Extraction | 4 | | 20 | | Key West RC |
| | 264 | | 1,320 | | NSWC Panama City |
| Line Charge Testing | 4 | | 20 | | NSWC Panama City |
| Acoustic Component Testing | 33 | | 165 | | SFOMF |
| Chemical and Biological Simulant Testing | 80 | | 400 | | JAX RC |
| | 80 | | 400 | | Navy Cherry Point RC |
| | 80 | | 400 | | Northeast RC |
| | 80 | | 400 | | VACAPES RC |
| Non-Acoustic Component Testing | 4 | | 20 | | GOMEX RC |
| | 4 | | 20 | | VACAPES RC |
| Payload Deployer Testing | 1 | | 5 | | GOMEX RC |
| | 1 | | 5 | | Northeast RC |
| | 39 | | 195 | | NUWC Newport |
| Semi-Stationary Equipment Testing | 4 | | 20 | | Newport, RI |
| | 11 | | 55 | | NSWC Panama City |
| | 190 | | 950 | | NUWC Newport |
| Towed Equipment Testing | 36 | | 180 | | NUWC Newport |

[1] For activities where the maximum number of events could vary between years, the information is presented as a "representative-maximum" number of events per year. For activities where no variation is anticipated, only the maximum number of events within a single year is provided.

[2] Locations given are areas where activities typically occur. However, activities could be conducted in other locations within the Study Area. Where multiple locations are provided within a single cell, the number of activities could occur in any of the locations, not in each of the locations.

Notes: Alt: Alternative; GOMEX: Gulf of Mexico; JAX: Jacksonville; JEB LC-FS: Joint Expeditionary Base Little Creek-Fort Story; NS: Naval Station; NSB: Naval Submarine Base; NSWC: Naval Surface Warfare Center; NUWC: Naval Undersea Warfare Center; PNS: Portsmouth Naval Shipyard; RC: Range Complex; SFOMF: South Florida Ocean Measurement Facility Testing Range; VACAPES: Virginia Capes

## Table 2.6-4: Office of Naval Research Proposed Testing Activities per Alternative

| *Activity Name* | *Annual # of Activities* | | *5-Year # of Activities* | | *Location* |
|---|---|---|---|---|---|
| | *Alt 1* | *Alt 2* | *Alt 1* | *Alt 2* | |
| ***Acoustic and Oceanographic Science and Technology*** | | | | | |
| Acoustic and Oceanographic Research | 5 | | 22 | | GOMEX RC |
| | 9 | | 43 | | Northeast RC |
| | 2 | | 10 | | Other AFTT Areas[1] |
| | 2 | | 12 | | VACAPES RC |
| Emerging Mine Countermeasure Technology Research | 1 | | 5 | | JAX RC |
| | 2 | | 12 | | Northeast RC |
| | 1 | | 5 | | VACAPES RC |
| Large Displacement Unmanned Underwater Vehicle Testing | 4 | | 20 | | GOMEX RC |
| | 12 | | 60 | | JAX RC |
| | 4 | | 20 | | Navy Cherry Point RC |
| | 16 | | 80 | | Northeast RC |
| | 8 | | 40 | | VACAPES RC |

[1] Other AFTT Areas include areas outside of range complexes and testing ranges but still within the AFTT Study Area. Other AFTT Area activities typically refer to those activities that occur while vessels are in transit.

Notes: AFTT: Atlantic Fleet Training and Testing; Alt: Alternative; GOMEX: Gulf of Mexico; JAX: Jacksonville, Florida; RC: Range Complex; VACAPES: Virginia Capes

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