Draft
Environmental Impact Statement/Overseas Environmental Impact Statement
Atlantic Fleet Training and Testing

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3.1 AIR QUALITY

AIR QUALITY SYNOPSIS

The United States Department of the Navy considered all potential stressors that air quality could potentially be exposed to from the Proposed Action. The following conclusions have been reached for the Preferred Alternative:

- Criteria Air Pollutants: The emission of criteria pollutants resulting from activities in the Study Area would not cause a violation or contribute to an ongoing violation of the National Ambient Air Quality Standards.

3.1.1 INTRODUCTION

Air pollution is a threat to human health and also damages the environment (U.S. Environmental Protection Agency, 2007). Air pollution damages trees, crops, other plants, lakes, and animals. In addition to damaging the natural environment, air pollution damages the exteriors of buildings, monuments, and statues. It creates haze or smog that reduces visibility in national parks and cities and interferes with aviation. To improve air quality and reduce air pollution, Congress passed the Clean Air Act and its amendments in 1970 and 1990, which set regulatory limits on air pollutants and help to ensure basic health and environmental protection from air pollution.

Air quality is defined by ambient concentrations of specific air pollutants – pollutants the U.S. Environmental Protection Agency (USEPA) determined may affect the health or welfare of the public. The six major pollutants of concern are called "criteria pollutants": carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, particulate matter (dust particles less than or equal to 10 microns in diameter and fine particulate matter less than or equal to 2.5 microns in diameter), and lead. The Clean Air Act required that the USEPA establish National Ambient Air Quality Standards for these criteria pollutants. These standards set specific concentration limits for criteria pollutants in the outdoor air. The concentration limits were developed because the criteria pollutants are common in outdoor air, considered harmful to public health and the environment, and come from numerous and diverse sources. The concentration limits are designed to aid in protecting public health and the environment. Areas with air pollution problems typically have one or more criteria pollutants consistently present at levels that exceed the National Ambient Air Quality Standards. These areas are designated as nonattainment for the standards.

Criteria air pollutants are classified as either primary or secondary pollutants based on how they are formed in the atmosphere. Primary air pollutants are emitted directly into the atmosphere from the source of the pollutant and retain their chemical form. Examples of primary pollutants are the smoke produced by burning wood and volatile organic compounds emitted by industrial solvents. Secondary air pollutants are those formed through atmospheric chemical reactions that usually involve primary air pollutants (or pollutant precursors) and normal constituents of the atmosphere. Ozone, a major component of photochemical smog, is a secondary air pollutant. Ozone precursors fall into two broad groups of chemicals: nitrogen oxides and volatile organic compounds. Nitrogen oxides consists of nitric oxide and nitrogen dioxide.

Finally, some criteria air pollutants are a combination of primary and secondary pollutants. Particulate matter less than or equal to 10 microns in diameter and particulate matter less than or equal to 2.5 microns in diameter are generated as primary pollutants by various mechanical processes (e.g., abrasion, erosion, mixing, or atomization) or combustion processes. They are generated as secondary pollutants through chemical reactions or through the condensation of gaseous pollutants into fine aerosols.

In addition to the six criteria pollutants, the USEPA currently designates 187 substances as hazardous air pollutants under the federal Clean Air Act. Hazardous air pollutants are air pollutants known or suspected to cause cancer or other serious health effects, or adverse environmental and ecological effects (U.S. Environmental Protection Agency, 2016a) National Ambient Air Quality Standards are not established for these pollutants; however, the USEPA developed rules that limit emissions of hazardous air pollutants from specific industrial sources. These emissions control standards are known as "maximum achievable control technologies" and "generally achievable control technologies." They are intended to achieve the maximum degree of reduction in emissions of the hazardous air pollutants, taking into consideration the cost of emissions control, non-air quality health and environmental impacts, and energy requirements. These emissions are typically one or more orders of magnitude smaller than concurrent emissions of criteria air pollutants, and only become a concern when large amounts of fuel, explosives, or other materials are consumed during a single activity or in one location. Hazardous air pollutants are analyzed qualitatively in relation to the prevalence of the sources emitting these pollutants during training and testing activities. Mobile sources operating as a result of the Proposed Action would be functioning intermittently over a large area and would produce negligible ambient hazardous air pollutants in a localized area not located near any publicly accessible areas. For these reasons, hazardous air pollutants are not further evaluated in the analysis. Air pollutant emissions are reported as the rate (by weight or volume) at which specific compounds are emitted into the atmosphere by a source. Most air pollutant emissions are expressed as a rate (e.g., pounds per hour, pounds per day, or tons per year). Typical units for emission factors for a source or source activity are pounds per thousand gallons of fuel burned, pounds per ton of material processed, and grams per vehicle-mile of travel.

Ambient air quality is reported as the atmospheric concentrations of specific air pollutants at a particular time and location. The units of measurement are expressed as a mass per unit volume (e.g., micrograms per cubic meter [$\mu g/m^3$] of air) or as a volume fraction (e.g., parts per million [ppm] by volume).The ambient air pollutant concentrations measured at a particular location are determined by the pollutant emissions rate, local meteorology, and atmospheric chemistry. Wind speed and direction, the vertical temperature gradient of the atmosphere, and precipitation patterns affect the dispersal, dilution, and removal of air pollutant emissions from the atmosphere.

3.1.1.1 Air Quality Standards

National Ambient Air Quality Standards for criteria pollutants are set forth in Table 3.1-1. Areas that exceed a standard are designated as "nonattainment" for that pollutant, while areas that are in compliance with a standard are in "attainment" for that pollutant. An area may be nonattainment for some pollutants and attainment for others simultaneously.

Table 3.1-1: National Ambient Air Quality Standards

Pollutant		*Primary/ Secondary*	*Averaging Time*	*Level*	*Form*
Carbon monoxide		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead		primary and secondary	Rolling 3-month period	0.15 µg/m^{3} [1)]	Not to be exceeded
Nitrogen dioxide		primary	1 hour	100 parts per billion (ppb)	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb [(2)]	Annual mean
Ozone		primary and secondary	8 hours	0.070 ppm [(3)]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle pollution (particulate matter)	particulate matter less than or equal to 2.5 microns in diameter	primary	1 year	12.0 µg/m^3	Annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	Annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	particulate matter less than or equal to 10 microns in diameter	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years

Table 3.1-1: National Ambient Air Quality Standards (continued)

Pollutant	*Primary/ Secondary*	*Averaging Time*	*Level*	*Form*
Sulfur dioxide	primary	1 hour	75 ppb[4]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the lead standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

(2)The level of the annual nitrogen dioxide standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3)Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) ozone standards additionally remain in effect in some areas. Revocation of the previous (2008) ozone standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4)The previous sulfur dioxide standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which implementation plans providing for attainment of the current (2010) standard have not been submitted and approved and which is designated nonattainment under the previous sulfur dioxide standards or is not meeting the requirements of a State Implementation Plan call under the previous sulfur dioxide standards (40 Code of Federal Regulations [CFR] 50.4(3)). A State Implementation Plan call is a USEPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the require National Ambient Air Quality Standards.

Source: (U.S. Environmental Protection Agency, 2016b), last updated January 7, 2016.

Notes: µg/m^3 = micrograms per cubic meter; ppb = parts per billion; ppm = parts per million

States, through their air quality management agencies, are required to prepare and implement State Implementation Plans for nonattainment areas, which demonstrate how the area will meet the National Ambient Air Quality Standards. Areas classified as attainment, after being designated as nonattainment, may be reclassified as maintenance areas subject to maintenance plans showing how the area will continue to meet federal air quality standards. Nonattainment areas for some criteria pollutants are further classified, depending on the severity of their air quality problem, to facilitate their management:

- ozone – marginal, moderate, serious, severe, and extreme
- carbon monoxide – moderate and serious
- particulate matter – moderate and serious

The USEPA delegates the regulation of air quality to the state once the state has an approved State Implementation Plan. If the state fails to develop an adequate plan to achieve and maintain the National Ambient Air Quality Standards or a State Implementation Plan revision is not approved by EPA, federal agencies must comply with the Federal Implementation Plan. States may also choose to adopt the Federal Implementation Plan as an alternative to developing their own State Implementation Plan. States may establish air quality standards more stringent than the National Ambient Air Quality Standards, however they are prohibited from imposing more stringent conformity requirements unless the requirements apply equally to non-Federal activities.

The Atlantic Fleet Training and Testing (AFTT) Study Area is offshore of a number of states, and some elements of the Proposed Action occur within or over state waters. State waters extend from the

shoreline to 3 NM from Maine to the east coast of Florida, Alabama, Mississippi, Louisiana, and to 9 NM for the west coast of Florida and Texas. A coastal state exercises sovereignty over its territorial sea, the air space above it, and the seabed and subsoil beneath it. Some activities occur in state waters and primarily involve the use of small boats as is the case with inland training on state waters. These activities occur in a variety of locations such as Narragansett Bay, the lower Chesapeake Bay, the James and York Rivers, Kings Bay, Cooper River, St. Johns River, and St. Andrew Bay. However, most of the Study Area is substantially offshore, beyond state boundaries where attainment status is unclassified and Clean Air Act National Ambient Air Quality Standards do not apply. There may be seasonal or other temporal fluctuations in wind direction, and during these periods, air quality in adjacent onshore areas may be affected by releases of air pollutants from mobile sources within the Study Area. Impacts at a scale that would produce demonstrable air quality impacts would typically be the result of heavy marine traffic in areas such as large ports but military activity could incrementally impact these areas. Therefore, National Ambient Air Quality Standards attainment status of adjacent onshore areas is considered in determining whether appropriate controls for air pollution sources in the adjacent offshore state waters is warranted.

3.1.1.2 General Conformity Evaluation

Federal actions are required to conform with the approved State Implementation Plan for those areas of the United States designated as nonattainment or maintenance areas for any criteria air pollutant under the Clean Air Act (40 CFR parts 51 and 93). The purpose of the General Conformity Rule is to ensure that applicable Federal actions, such as the Proposed Action evaluated in this EIS/OEIS, would not cause or contribute to a violation of an air quality standard and that the Proposed Action would not adversely affect the attainment and maintenance of National Ambient Air Quality Standards. A conformity evaluation must be completed for every applicable Navy action that generates emissions to determine and document whether a proposed action complies with the General Conformity Rule. If a federal action is not an emergency response action, presumed to conform under the Rule, does not meet the approved facility emissions budget, is not a listed exempt activity, and is not covered by the Transportation Conformity Rule, then a conformity demonstration evaluating total direct and indirect emissions must be made. In determining the total direct and indirect emissions caused by the action, agencies must project the future emissions in the area with the action versus the future emissions without the action, what the National Environmental Policy Act (NEPA) entitles “the no build option.” The total direct and indirect emissions considers all emission increases and decreases and must be reasonably foreseeable at the time that the conformity evaluation is conducted and are possibly controllable through agency's continuing program responsibility to affect emissions.

The first step in the demonstration is a Conformity Applicability Analysis and involves calculating the non-exempt direct and indirect emissions associated with the action. The emissions thresholds that trigger the conformity requirements are called *de minimis* levels. The total emissions calculated for the direct and indirect emissions are then compared to the air emissions that for direct and indirect emissions do not exceed the *de minimis* levels, then a General Conformity Determination is not required. If the net change emissions equal or exceed the *de minimis* conformity applicability threshold values, a formal Conformity Determination must be prepared to demonstrate conformity with the approved State Implementation Plan.

The Navy Guidance for Compliance with the Clean Air Act General Conformity Rule section 4.1, states that a Record of Non-Applicability must be prepared if the proposed action is subject to the Conformity Rule, but is exempt because it fits within one of the exemption categories listed under 40 CFR 93B,

because the action's projected emissions are below the *de minimis* conformity applicability threshold values, or is presumed to conform (U.S. Department of the Navy, 2013).

Compliance is presumed if the net change in emissions resulting from a proposed federal action would be less than the relevant *de minimis* threshold. If the net change in emissions exceeds the *de minimis* thresholds, then a formal conformity determination must be prepared. *De minimis* levels are shown in Table 3.1-2. Note that *de minimis* levels for ozone precursors may be lower where nonattainment is a serious issue in the ozone transport region. This region includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, and the Washington, D.C. Metropolitan Statistical Area, including the northern Virginia suburbs (Ozone Transport Commission, 2017). The Ozone Transport Region is an area subjected to poor air quality in the warm summer months resulting from ozone pollution. Contributing to the problem are local sources of air pollution as well as air pollution transported hundreds of miles from distant sources in and outside of the Ozone Transport Region. Transport most frequently originates in the Midwest and the Ohio River Valley.

Table 3.1-2: *De Minimis* Thresholds for Conformity Determinations

Pollutant	*Nonattainment or Maintenance Area Type*	*de Minimis Threshold (TPY)*
Ozone (VOC or NO_X)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO_X)	Marginal and moderate nonattainment inside an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
CO, SO_2 and NO_2	All nonattainment and maintenance	100
PM_{10}	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
$PM_{2.5}$	All nonattainment and maintenance	100
Lead	All nonattainment and maintenance	25

Source: (U.S. Environmental Protection Agency, 2010a)

Notes: CO: carbon monoxide; NOX: nitrogen oxides; NO_2: nitrogen dioxide; PM_{10}: particulate matter ≤ 10 microns in diameter; $PM_{2.5}$: particulate matter ≤ 2.5 microns in diameter; SO_2: sulfur dioxide; SO_X: sulfur oxides; TPY: tons per year; VOC: volatile organic compound

3.1.1.2.1 Conformity Analysis in Nonattainment and Maintenance Areas

Certain Navy training and testing activities take place within nonattainment and maintenance areas. These nonattainment and maintenance areas are identified by their air quality designated areas (an area designated by the federal government where communities share a common air pollution problem). Several designated areas were identified as relevant to AFTT Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) training or testing activities and are further discussed in Section 3.1.2.3, Existing Air Quality.

3.1.1.3 Approach to Analysis

Boundaries of Analysis

The air quality impact evaluation requires two separate analyses. Impacts of air pollutants emitted by Navy training and testing in the Atlantic Ocean, state waters, bays and inland locations are assessed under NEPA. Impacts of air pollutants emitted by Navy training and testing activities outside state waters are evaluated as required under Executive Order 12114.

Air pollutants emitted more than 3,000 feet (ft.) above ground level are considered to be above the atmospheric inversion layer and, therefore, do not affect ground-level air quality (U.S. Environmental Protection Agency, 2007, 2008, 2009). These emissions thus do not affect the concentrations of criteria air pollutants in the lower atmosphere, which are measured at ground-level monitoring stations, and upon which federal, state, and local regulatory decisions are based. For the analysis of the effects on global climate change, however, all emissions of greenhouse gases from aircraft and vessels participating in training and testing activities, as well as targets and munitions expended, are applicable regardless of altitude (Chapter 4, Cumulative Impacts). However, because activities above 3,000 ft. for individual aircraft activities are not specifically documented, it would be impossible to analyze with any accuracy the GHGs associated with testing and training activity flights above 3,000 ft. For this reason, the GHG emissions that are assessed should be understood to represent only a portion of the total emissions from aircraft flight activities.

Analysis of health-based air quality impacts under NEPA and Executive Order 12114 includes estimates of criteria air pollutants for all training and testing activities where aircraft, missiles, or targets operate at or below the aforementioned inversion layer or that involve vessels in U.S. territorial seas. The analysis of health-based air quality impacts under Executive Order 12114 includes emissions estimates of only those training and testing activities in which aircraft, missiles, or targets operate at or below 3,000 ft. above ground level, or that involve vessels outside of U.S. territorial seas.

Emission Sources

Criteria air pollutants are generated by the combustion of fuel by surface vessels and by fixed-wing and rotary-wing aircraft. They also are generated by the combustion of explosives and propellants in various types of munitions. Propellants used to fire small-, medium-, and large-caliber projectiles generate criteria pollutants when detonated. Non-explosive practice munitions contain spotting charges and propellants that generate criteria air pollutants when they function. Powered targets require fuel, generating criteria air pollutants during their operation, and towed targets generate criteria air pollutants secondarily because another aircraft or vessel is required to provide power. Stationary targets may generate criteria air pollutants if all or portions of the item burn in a high-order detonation. Chaff cartridges used by ships and aircraft are launched by an explosive charge that generates small quantities of criteria air pollutants. Countermeasure flares, parachute flares, and smoke floats are designed to burn for a prescribed period, emitting criteria pollutants in the process.

The primary emissions from many munition types are carbon dioxide, carbon monoxide, and particulate matter; hazardous air pollutants are emitted at low levels (U.S. Environmental Protection Agency, 2007, 2008, 2009).

Electronic warfare countermeasures generate emissions of chaff, a form of particulate not regulated under the federal Clean Air Act as a criteria air pollutant. Virtually all radio frequency chaff is 10 to 100 times larger than particulate matter under particle matter less than or equal to 10 microns in diameter and particulate matter less than or equal to 2.5 microns in diameter (Spargo et al., 1999). The types of

training and testing that produce these other emissions may take place throughout the Study Area, but occur primarily within special use airspace. Chaff emissions during training and testing primarily occur 3 NM or more from shore and at altitudes over 3,000 ft. (above the mixing layer). Chaff released over the ocean would disperse in the atmosphere and then settle onto the ocean surface.

A study at Naval Air Station Fallon found that the release of 50,000 cartridges of chaff per year over 10,000 square miles (m^2) would result in an annual average concentration of 0.018 µg/$m^3$for regulated particulate matter. This is far below the National Ambient Air Quality Standards. Similar predictions were made for St. Mary's County, Maryland (on the Chesapeake Bay), where chaff releases contribute no more than 0.008 percent of total particulate matter emissions (Arfsten et al., 2001). Therefore, chaff is not further evaluated as an air quality stressor in this EIS/OEIS.

3.1.1.3.1 Analysis Framework

Emissions sources and the approach used to estimate emissions under Alternative 1 and Alternative 2 for the air quality analysis are based, wherever possible, on information from Navy subject matter experts and established training and testing requirements. These data were used to estimate the numbers and types of aircraft, surface ships and vessels, submarines, and munitions (i.e., potential sources of air emissions) that would be involved in training and testing activities under each alternative. Emissions were assessed to identify any possibility for the magnitude of Proposed Action emissions to result in a violation of one or more National Ambient Air Quality Standards.

The NEPA analysis includes a Clean Air Act General Conformity Applicability Analysis to support a determination pursuant to the General Conformity Rule (40 CFR part 93B). This analysis focuses on training and testing activities that could impact nonattainment or maintenance areas within the region of influence. As noted above, the Study Area lies partly within or adjacent to some air quality designated areas. To evaluate whether or not the General Conformity Rule applies, air pollutant emissions associated with the Proposed Action within the applicable designated nonattainment or maintenance areas are estimated, based on the distribution of mobile source activity in state waters and mobile source activity beyond state waters. The proposed training and testing activities within this portion of the Study Area are then compared to the General Conformity Rule *de minimis* thresholds.

3.1.1.4 Emission Estimates

3.1.1.4.1 Aircraft Activities

To estimate aircraft emissions, the operating modes, number of hours of operation, and type of engine for each type of aircraft were evaluated.

Emissions associated with airfield or air station operations ashore are analyzed within the home-basing environmental planning process (e.g., environmental impact statements or environmental assessments for (1) *Introduction of F/A-18 E/F (Super Hornet) Aircraft to the East Coast of the United States* (U.S. Department of the Navy, 2003); (2) Supplemental Environmental Impact Statement for the introduction of the P-8A Multi-Mission Aircraft into the U.S. Navy Fleet (U.S. Department of the Navy, 2014); (3) *Transition of E-2C Hawkeye to E-2D Advanced Hawkeye at Naval Station Norfolk, Virginia, Naval Base Ventura County Point Mugu, California* (U.S. Department of the Navy, 2009), and (4) *F-35B East Coast Basing Environmental Impact Statement* (U.S. Department of the Navy, 2010). All fixed-wing aircraft are assumed to travel to and from training and testing ranges at or above 3,000 ft. above mean sea level and, therefore, their transits to and from the ranges do not affect surface air quality. Air combat maneuvers and air-to-air missile exercises are primarily conducted at altitudes well in excess of 3,000 ft.

above mean sea level and, therefore, are not included in the estimated emissions of criteria air pollutants. Activities or portions of those training or testing activities occurring below 3,000 ft. are included in emissions estimates. Examples of activities typically occurring below 3,000 ft. include those involving helicopter platforms such as mine warfare, surface warfare, and anti-submarine warfare training and testing activities. The number of all training and testing activities and the estimated time spent above or below 3,000 ft. for calculation purposes is included in the air quality emissions estimates presented in Appendix C (Air Quality Example Emissions Calculations).

The types of aircraft identified include the typical aircraft platforms that conduct a particular training or testing exercise (or the closest surrogate when information is not available), including range support aircraft (e.g., non-Navy commercial air services). Estimates of future aircraft sorties are based on evolutionary changes in the Navy's force structure and mission assignments. Where there are no major changes in types of aircraft, future activity levels are estimated from the distribution of baseline activities. The types of aircraft used in each training or testing activity along with hours operated in the mission activity, as well as data on landings and take-offs from ships, and numbers of sorties flown by such aircraft are presented in Appendix C (Air Quality Emissions Calculations).

Several testing activities are similar to training activities, and therefore similar assumptions were made for such activities in terms of aircraft type, altitude, and flight duration. Table 2.3-4 lists Naval Air Systems Command testing activities similar to certain training activities. Where aircraft testing activities were dissimilar to training activities, Assumptions for time on ranges, and landing and takeoff information were derived by Navy subject matter experts.

Air pollutant emissions from aircraft were primarily estimated based on the training and testing hours provided by subject matter experts, as well as emission indices published in the Navy's Aircraft Environmental Support Office Memorandum Reports for individual aircraft categories. When Aircraft Environmental Support Office emission factor data were not available, emission factors were obtained from other published sources.

The emissions calculations performed for each alternative conservatively assume that each aircraft training and testing activity listed in Tables 2.3-1 to 2.3-4 is separately conducted. In practice, a testing activity may be conducted during a training flight. It is also probable that two or more training activities may be conducted during one flight (e.g., chaff or flare exercises may occur during electronic warfare activities; or air-to-surface gunnery and air-to-surface bombing activities may occur during a single flight operation). Conservative assumptions may produce elevated aircraft emissions calculations but account for the possibility, however remote, that each aircraft training and testing activity is separately conducted.

3.1.1.4.2 Military Vessel Activities

Military vessel traffic in the Study Area includes military ships and smaller boats providing services for military training and testing activities. The methods for estimating military ship emissions involve evaluating the type of activity, generating the average steaming hours for ships in each operational area, both within state waters and beyond state waters. This was done to create annual averages for the years 2010 through 2015. The average annual hours were used for Alternative 1. For Alternative 2, the year with the highest number of operational hours (2011) was selected as the year to represent maximum operations. For both alternatives, the hourly data was used with data from the Naval Sea Systems Command Navy and Military Sealift Command Marine Engine Fuel Consumption and Emission Calculator to calculate the emissions from the propulsion and onboard generation systems. Data from

the calculator included emission factors for each type of propulsion and type of onboard generator by ship type, as well as the fuel used. The types of ships and numbers of activities for Alternatives 1 and 2 are derived from range records and Navy subject matter experts regarding ship participant data. Estimates of future ship activities are based on anticipated evolutionary changes in the Navy's force structure and mission assignments. Where there are no major changes in types of ships, estimates of future activities are based on the historical distribution of ship activities. Emission factors for military ships were obtained from the Naval Sea Systems Command database, Navy and Military Sea Lift Marine Engine Fuel Consumption and Emissions Calculator. Emission factors were provided for each marine vessel type and the applicable power levels. The resulting calculations provided information on the time spent at each power level in each part of the Study Area, emission factors for that power level (in pounds of pollutant per hour), and total emissions for each marine vessel for each operational type and mode.

Boat emissions were estimated based on activity data provided by the Navy, which included the type and number of boats, locations, and total number of hours running. Emissions factor data came from the Navy or from USEPA documentation on nonroad engines (U.S. Environmental Protection Agency, 2010b).The pollutants for which calculations are made include exhaust total hydrocarbons, carbon monoxide, nitrogen oxides, particulate matter, carbon dioxide, and sulfur dioxide. For non-road engines, 100 percent of all of the particulate matter less than or equal to 10 microns in diameter from gasoline and diesel-fueled engines is assumed to be particulate matter less than or equal to 2.5 microns in diameter (U.S. Environmental Protection Agency, 2010b). For gaseous-fueled engines (liquefied petroleum gas/compressed natural gas), 100 percent of the particulate matter emissions are assumed to be particulate matter less than or equal to 2.5 microns in diameter (U.S. Environmental Protection Agency, 2010b).

The emissions calculations performed for each alternative conservatively assume that each vessel training and testing activity listed in Chapter 2, Tables 2.3-1 to 2.3-4, is separately conducted and separately produces vessel emissions. In practice, one or more testing activities may take advantage of an opportunity to travel at sea and test aboard a vessel conducting a related or unrelated training activity. It is also probable that two or more training activities may be conducted during one training vessel movement (e.g., a ship may conduct large-, medium-, and small-caliber surface-to-surface gunnery exercises during one vessel movement). Furthermore, multiple unit-level training activities may be conducted during a larger composite training unit exercise. Conservative assumptions may produce elevated vessel emissions calculations but account for the possibility, however remote, that each training and testing activity is separately conducted.

3.1.1.4.3 Submarine Activities

No U.S. submarines burn fossil fuel under normal operating conditions. Therefore, no air pollutants are emitted during submarine training or testing activities.

3.1.1.4.4 Naval Gunfire, Missiles, Bombs, Other Munitions, and Military Expended Material

Naval gunfire, missiles, bombs, and other types of munitions used in training and testing activities emit air pollutants. To estimate the amounts of air pollutants emitted by munitions during its use, the numbers and types of munitions used during training or testing activities are first totaled. Then generally accepted emissions factors (U.S. Environmental Protection Agency, 2007, 2008, 2009) for criteria air pollutants are applied to the total amounts. Finally, the total amounts of air pollutants emitted by each

munition type are summed to produce total amounts of each criteria air pollutant under each alternative.

3.1.1.5 Climate Change

Greenhouse gases are compounds that contribute to the greenhouse effect—a natural phenomenon in which gases trap heat within the lowest portion of the earth's atmosphere (surface-troposphere system), causing heating (radiative forcing) at the surface of the earth. The primary long-lived greenhouse gases directly emitted by human activities are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride, and sulfur hexafluoride. Carbon dioxide, methane, and nitrous oxide occur naturally in the atmosphere. These gases influence the global climate by trapping heat in the atmosphere that would otherwise escape to space. The heating effect from these gases is considered the probable cause of the global warming observed over the last 50 years (U.S. Environmental Protection Agency, 2009a). Global warming and climate change affect many aspects of the environment. Not all effects of greenhouse gases are related to climate. For example, elevated concentrations of carbon dioxide can lead to ocean acidification and stimulate terrestrial plant growth, and methane emissions can contribute to higher ozone levels.

The administrator of the USEPA determined that six greenhouse gases in combination endanger both the public health and the public welfare of current and future generations. The USEPA specifically identified carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride as greenhouse gases (U.S. Environmental Protection Agency, 2009b).

To estimate global warming potential, which is the heat trapping capacity of a gas, the United States quantifies greenhouse gas emissions using the 100-year timeframe values established in the Intergovernmental Panel on Climate Change Fourth Assessment Report (Intergovernmental Panel on Climate Change, 2007), in accordance with United Nations Framework Convention on Climate Change (United Nations Framework Convention on Climate Change, 2013) reporting procedures. All global warming potentials are expressed relative to a reference gas, carbon dioxide, which is assigned a global warming potential equal to 1. Six other primary greenhouse gases have global warming potentials: 25 for methane, 298 for nitrous oxide, 124 to 14,800 for hydrofluorocarbons, 7,390 to greater than 17,340 for perfluorocarbons, 17,200 for nitrogen trifluoride, and up to 22,800 for sulfur hexafluoride. To estimate the carbon dioxide equivalency of a non-carbon dioxide greenhouse gas, the appropriate global warming potential of that gas is multiplied by the amount of the gas emitted. All seven greenhouse gases are multiplied by their global warming potential and the results are added to calculate the total equivalent emissions of carbon dioxide. The dominant greenhouse gas emitted is carbon dioxide, mostly from fossil fuel combustion (85.4 percent) (U.S. Environmental Protection Agency, 2016c). Weighted by global warming potential, methane is the second largest component of emissions, followed by nitrous oxide. Global warming potential-weighted emissions are presented in terms of equivalent emissions of carbon dioxide, using units of metric tonnes. The Proposed Action is anticipated to release greenhouse gases to the atmosphere. These emissions are quantified (primarily using methods elaborated upon in the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2014)for the proposed Navy training and testing in the Study Area, and estimates are presented in Chapter 4 (Cumulative Impacts) (U.S. Environmental Protection Agency, 2016c).

The potential effects of proposed greenhouse gas emissions are by nature global and may result in cumulative impacts because most individual sources of greenhouse gas emissions are not large enough

to have any noticeable effect on climate change. Therefore, the impact of proposed greenhouse gas emissions to climate change is discussed in the context of cumulative impacts.

3.1.1.6 Other Compliance Considerations, Requirements, and Practices

Executive Order 13693, *Planning for Federal Sustainability in the Next Decade,* issued on March 19, 2015, establishes policy for federal agencies to maintain federal leadership in sustainability and greenhouse gas emission reductions. As noted in the Order, through a combination of more efficient federal operations, agency direct greenhouse gas emissions can be reduced by at least 40 percent over the next decade while fostering innovation, reducing spending, and strengthening the communities in which federal facilities operate.

In June 2014, Department of Defense (DoD) released the 2014 Climate Change Adaptation Roadmap to document DoD's efforts to plan for the changes that are occurring or expected to occur as a result of climate change. The Roadmap provides an overview and specific details on how DoD's adaptation will occur and describes ongoing efforts (U.S. Department of Defense, 2014).

3.1.1.6.1 Current Requirements and Practices

The Navy is committed to improving energy security and environmental stewardship by reducing reliance on fossil fuels. The Navy is actively developing and participating in energy, environmental, and climate change initiatives that will increase use of alternative energy and reduce emissions of greenhouse gases. The Navy has adopted energy, environmental, and climate change goals. These goals include increasing alternative energy use Navy-wide to 50 percent by 2020; reducing non-tactical petroleum use; ensuring environmentally sound acquisition practices; ensuring environmentally compliant operations for ships, submarines, aircraft, and facilities operated by the Navy; and implementing applicable elements of the Climate Change Adaptation Roadmap.

Equipment used by military units in the Study Area, including ships and other marine vessels, aircraft, and other equipment, are properly maintained and fueled in accordance with applicable Navy requirements. Operating equipment meets federal and state emission standards, where applicable.

3.1.2 AFFECTED ENVIRONMENT

3.1.2.1 General Background

3.1.2.1.1 Region of Influence

The region of influence for air quality is a function of the type of pollutant, emission rates of the pollutant source, proximity to other emission sources, and local and regional meteorology. Figure 3.1-1 through Figure 3.1-4 present maps of the nonattainment and maintenance areas in the vicinity of the Study Area. For inert pollutants (all pollutants other than ozone and its precursors), the region of influence is generally limited to a few miles downwind from the source. For a photochemical pollutant such as ozone, however, the region of influence may extend much farther downwind. Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors (volatile organic compounds and nitrogen oxides). The maximum impacts of precursors on ozone levels tend to occur several hours after the time of emission during periods of high solar load, and may occur many miles from the source. Ozone and ozone precursors transported from other regions can also combine with local emissions to produce high local ozone concentrations. Therefore, the region of influence for air quality includes the Study Area as well as adjoining land areas several miles inland, which may from time to time be downwind from emission sources associated with the Proposed Action.

3.1.2.2 Sensitive Receptors

Identification of sensitive receptors is part of describing the existing air quality environment. Sensitive receptors are individuals in residential areas, schools, parks, hospitals, or other sites for which there is a reasonable expectation of continuous human exposure during the timeframe coinciding with peak pollution concentrations. On the oceanic portions of the Study Area, crews of commercial vessels and recreational users of the northern Atlantic Ocean and Gulf of Mexico could encounter the air pollutants generated by the Proposed Action. Few such individuals are expected to be present and the duration of substantial exposure to these pollutants is limited because the areas are cleared of nonparticipants before event commencement. These potential receptors are not considered sensitive.

3.1.2.2.1 Climate of the Study Area

The climatic conditions in the Study Area provide background on factors influencing air quality. Climate zones within the Study Area vary with latitude or region. For air quality, the Study Area can be divided into four areas: the North Atlantic Region (Arctic region to Nova Scotia), the Mid-Atlantic Region (Maine to Virginia), the Southeast Atlantic Region (North Carolina to southern Florida) and the Gulf of Mexico Region (southern Florida to Texas).

The climate is arctic near the 65-degree north latitude line and tropical at the 20-degree north latitude line, but most activities and their potential effects would occur in the northern temperate to subtropical climate zones between Maine, Florida, and the Gulf Coast.

The climate of the offshore Atlantic Ocean and adjacent land areas is influenced by the temperatures of the surface waters and water currents as well as by wind blowing across the water. Offshore climates are moderate and seldom have extreme seasonal variations because the ocean is slow to change temperature. Ocean currents of the Atlantic Ocean (i.e., Labrador, Gulf Stream, North Atlantic Drift, Canary, and North Equatorial) influence climate by moving warm and cold water between regions. Adjacent land areas are affected by wind that is cooled or warmed when blowing over these currents. In addition to its influence on temperature, the wind moves evaporated moisture from the ocean to adjacent land areas and is a major source of rainfall.

With the advent of human induced climate change, spatial and temporal variations in weather patterns have emerged or have become more pronounced. Very heavy precipitation events have increased across the eastern half of the United States, with the most pronounced increase involving the mid-Atlantic and New England states (Melillo et al., 2014). Other changes apparent along the eastern seaboard include the rising incidence of heat waves and their extended duration and coastal flooding due to sea level rise and storm surge. In the South and along the Gulf Coast, the incidence of extreme storms, such as hurricanes, continues to rise. These changes to weather patterns have long term consequences for regional climates and the flora and fauna of the regions.

3.1.2.2.1.1 Newfoundland-Labrador Shelf and Scotian Shelf

The Newfoundland-Labrador Shelf and Scotian Shelf are not connected to the continental United States and do not include state waters, but do fall within the AFTT Study Area. This area does not fall under the purview of the Clean Air Act and, therefore, is not included in the air quality analysis. In the North Atlantic (Newfoundland-Labrador Shelf and Scotian Shelf) winter begins (when daily temperatures average 32° Fahrenheit [° F]) as early as mid-August in the Labrador Sea or as late as October 1 off the coast of the island of Newfoundland (Canadian Coast Guard, 2010). Winter ends in this region in mid-June. Sea ice begins to grow shortly after the onset of winter as average sea temperatures reach 29° to

35° F. Polar lows usually occur during the fall, winter, and early spring. Northeast United States Continental Shelf

Along the coasts of Maine to New Jersey, the most frequent wind directions measured by buoys are from the west or west-northwest, but wind can come from any direction (National Oceanic and Atmospheric Administration, 2017). The average wind speeds are between 12.4 and 16.2 miles per hour (mph). Wind speeds are typically lowest in July at 9.0 to 12.1 miles per hour (mph), and highest in January at 15.7 to 20.0 mph.

Annual average air temperature ranges from 47° to 60° F along the coast of Maine to New Jersey (National Oceanic and Atmospheric Administration, 2017). Seasonal variations in temperature are greatest during the winter months. In January and February, the ambient temperature averages 28° F along the coast of Maine to New Jersey. During the warmer months, there is little daily variation in temperature. In August, the average temperature is 75° F along the coast of this region.

Along the coasts of Maine to New Jersey, precipitation is frequent and abundant but occurs evenly throughout the year (Minerals Management Service, 2007). Average annual rainfall along the Atlantic Coast ranges from about 42 inches (in.) in Block Island, Rhode Island, to 58 in. in Miami, Florida. Rainfall in the warmer months is usually associated with cloud systems that produce showers and thunderstorms. Winter rains are associated with the passage of frontal systems through the eastern seaboard. Precipitation also falls as snow along the coasts of Maine to New Jersey. The highest snowfall among coastal U.S. areas within the Study Area occurs in Portland, Maine, with a maximum yearly average of 62.4 in.

3.1.2.2.1.2 Southeast United States Continental Shelf

Off the coast of North Carolina, the prevailing winds are from south to southwest, with average wind speeds between 13 to 16 mph. Off the coasts of South Carolina and Georgia, the prevailing wind direction is from south to southwest, and from southeast to east-southeast off of Florida. Average wind speeds range from 12 to 14 mph and wind speeds exhibit smaller monthly variations than northern coastal states.

Annual average air temperatures range from 70° to 75°F along the coast of the Southeast U.S. Continental Shelf (National Oceanic and Atmospheric Administration, 2017). In January and February, ambient temperatures average 55°F along the coast of the Southeast U.S. Continental Shelf. During the warmer months, there is little daily variation in temperature. In August, average temperatures are 83° F along the coast of this region. Air temperatures over the southern coast and offshore Atlantic Ocean have smaller daily and seasonal ranges than temperatures over inland areas because the ocean, which is slow to change temperature, has a stabilizing influence on ocean and coastal atmospheric temperatures.

At various locations along the Atlantic coast, fog occurs occasionally in the cooler months as a result of warm, moist air from the Gulf of Mexico blowing over cool land or water surfaces. The poorest visibility occurs from November through April. During periods of air stagnation, industrial pollution and agricultural burning also can affect visibility.

In the Southeast U.S. Continental Shelf coastal areas (generally from North Carolina to Florida), precipitation is frequent and abundant throughout the year, but tends to peak in the summer months.

Hurricanes develop in the southern part of the Atlantic Ocean. Hurricane season in the Atlantic Ocean runs from June to November, with a peak in mid-September. Most storms form in warm waters several hundred miles north of the equator. Once a tropical system forms, it usually travels west and slightly

north while strengthening. Many storms curve to the northeast near the Florida peninsula. The Atlantic basin averages about 10 storms of tropical storm strength or greater per year; about half reach hurricane level (National Oceanic and Atmospheric Administration, 2005). Storms weaken as they encounter cooler water, land, or vertical wind shear, sometimes slowing to an extra-tropical storm, mostly affecting northern Atlantic coastal areas.

3.1.2.2.1.3 Gulf of Mexico

The climate of the Gulf of Mexico is influenced mainly by the clockwise circulation around the semi-permanent area of high barometric pressure commonly known as the Bermuda High (Minerals Management Service, 2002). The Gulf of Mexico is southwest of this center of circulation. This high-pressure system results in a predominantly southeasterly wind flow in the Gulf of Mexico. Two important classes of storms occasionally occur with this circulation pattern. During the winter months, cold fronts associated with cold air masses from land influence the northern coast of the Gulf of Mexico. Behind the fronts, strong north winds bring drier air into the region. Secondly, hurricanes may develop in or migrate into the Gulf of Mexico during the warmer months. These storms may affect any area of the Gulf of Mexico and substantially change the local wind circulation around them. In coastal areas, the sea breeze may become the primary circulation feature during the summer months. Conversely, land breezes (particularly at night) transport air pollutants from land to offshore areas. Locally, the land breeze diminishes as more heat is retained within large, growing coastal cities (National Science Foundation, 2011). In general, however, the subtropical maritime climate is the dominant feature driving all aspects of the weather in this region. As a result, the climate shows very little daily or seasonal variation (Minerals Management Service, 2002).

Average air temperatures at Gulf of Mexico coastal locations (Texas to Florida) vary with latitude and exposure. Air temperatures range from highs in the summer of 88° to 96° F to lows in the winter of 37° to 59° F (Minerals Management Service, 2002). Temperatures depend on the frequency and intensity of polar air masses from the north. Air temperatures over the open waters of the Gulf of Mexico are more moderate and have smaller daily and seasonal temperature ranges than land temperatures because the Gulf of Mexico is slow to change temperature (Minerals Management Service, 2006). The average temperature over the center of the Gulf of Mexico is about 84° F in the summer and between 63° to 73° F in the winter(Minerals Management Service, 2006).

In the Gulf of Mexico portion of the Study Area, precipitation is frequent and abundant throughout the year (Minerals Management Service, 2002). Stations along the entire Gulf Coast record the highest precipitation values during the warmer months of the year. The warmer months usually have cloud systems that produce showers and thunderstorms; however, these thunderstorms rarely cause any damage or have hail (Minerals Management Service, 2002). The month of maximum rainfall for most locations in the Gulf of Mexico is July. Winter rains often come with frontal systems passing through the area. Rainfall is generally light, steady, and relatively continuous, often lasting several days. Snowfall is rare, and when snow or sleet does occur, it usually melts on contact with the ground. The chance for snow or sleet decreases with distance from shore, rapidly reaching zero.

Hurricanes affecting the Gulf of Mexico form near the equator in the Atlantic Ocean, the Caribbean Sea, and the Gulf of Mexico (Minerals Management Service, 2002). Data from 1886 to 1986 show that almost half (44.5 percent) of these hurricanes, or 3.7 storms per year, will affect the Gulf of Mexico (Minerals Management Service, 2002).

3.1.2.3 Existing Air Quality

As a whole, the air quality of the Study Area is very good. As shown in Figure 3.1-1 through Figure 3.1-3, most nonattainment and maintenance areas in the eastern half of the continental United States are in the northeastern states. They are also located in inland, urban, industrialized areas. This limited geographical extent with regard to potential air pollution results from the relatively low number of air pollutant sources, size, and topography of the Study Area, and prevailing meteorological conditions. In general, the coastal counties of the lower-middle and southern Atlantic as well as the Gulf of Mexico , including the Hampton Roads Intrastate area (in the vicinity of Naval Station Norfolk on **Figure** 3.1-2), are in attainment of the National Ambient Air Quality Standards. Being in attainment means that the areas maintain air quality better than the National Ambient Air Quality Standards.

Some other coastal areas, however, are either in nonattainment or are a designated maintenance area for one or more of the criteria pollutants. These designations are based on air quality data collected from monitors at locations in urban and rural setting, as well as modeling. Based on available information the USEPA designates an area as attainment, maintenance, nonattainment, or if there is a lack of available monitoring data for the area, it may be designated unclassifiable. Nonattainment and maintenance designations range from as small as a single location to large multi-state regions. Table 3.1-3 identifies the nonattainment and maintenance areas that are adjacent to the Study Area.

Table 3.1-3: Nonattainment and Maintenance Areas Adjacent to Study Area

Area Name	*Coastal Locations Included*	*Designation*
EPA Regions 1 & 2		
Central New Hampshire, NH	Rockingham County (p), Hillsborough County (p)	2010 SO2 (n)
Greater Connecticut	New London County	Ozone (n-moderate)
Hartford –New Britain-Middletown, CT	Middlesex County CT (p)	CO (m)
New Haven-Meriden-Waterbury, CT	New Haven County CT	CO (m)
New York-Northern New Jersey-Long Island, NY-NJ-CT	Fairfield, New Haven & Middlesex Counties (CT); Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, & Westchester Counties (NY); Bergen, Essex, Hudson, Union, Middlesex & Monmouth Counties (NJ)	Ozone (n-moderate)
	Fairfield & New Haven Counties (CT); Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, & Westchester Counties (NY); Bergen, Essex, Hudson, Union, Middlesex & Monmouth Counties (NJ)	1997 PM2.5 (m) and 2006 PM2.5 (m)
	New Haven County CT (p) New York County NY	PM10 (m) PM10 (n)
	Fairfield County CT (p)	CO (m)
Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE	Atlantic, Cape May & Ocean Counties	Ozone (n-marginal)
EPA Region 3		
Seaford, DE	Sussex County	Ozone (n-marginal

Table 3.1-3: Nonattainment and Maintenance Areas Adjacent to Study Area (continued)

Area Name	*Coastal Locations Included*	*Designation*
EPA Region 4		
Nassau County, FL	Nassau County, FL (p)	2010 SO2 (n)
Hillsborough County, FL	Hillsborough County, FL (p)	2010 SO2 (n)
	Tampa, FL (p)	2008 Lead
EPA Region 6		
Saint Bernard Par LA	Saint Bernard Parish, LA	2010 SO2 (n)
Houston-Galveston-Brazoria, TX	Brazoria, Chambers, Galveston Counties, TX	Ozone (n-moderate)

Source: (U.S. Environmental Protection Agency, 2017)

Notes: (p) means partial; (n) means nonattainment; (m) means maintenance

CO: carbon monoxide; PM_{10}: particulate matter ≤ 10 microns in diameter; $PM_{2.5}$: particulate matter ≤ 2.5 microns in diameter; SO_2: sulfur dioxide

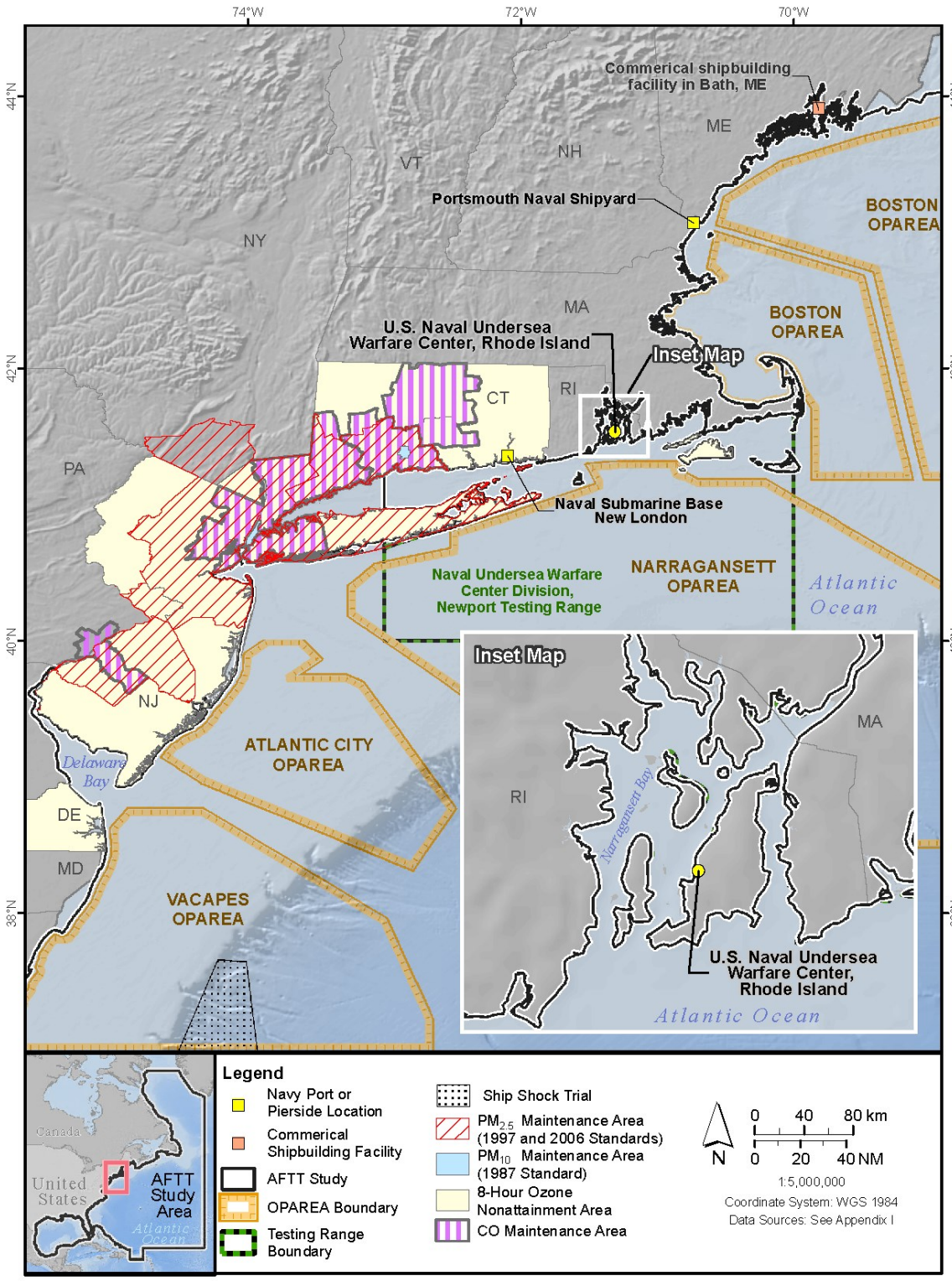
The Greater Connecticut area is designated as moderate nonattainment for ozone. Table 3.1-4 lists Study Area pierside locations and the attainment status for each.

Table 3.1-4: Pierside and Coastal Activity Locations and Their Area's Attainment Status

Pierside Location	*Designated Area*	*National Ambient Air Quality Standards Attainment Status*
Portsmouth Naval Shipyard, Kittery Maine; Shipyard – Bath, Maine	Metropolitan Portland/ Cumberland County	Attainment of all applicable standards
Naval Undersea Warfare Center, Division, Newport, Newport, Rhode Island	Providence (all of RI), RI	Attainment of all applicable standards
Naval Submarine Base New London; Groton, Connecticut Shipyard – Groton, Connecticut and Thames River	Greater Connecticut, CT	Moderate nonattainment of the 8-hour ozone standard Attainment of all other applicable standards
Naval Station Norfolk, Norfolk, Virginia; Joint Expeditionary Base Little Creek-Fort Story, Virginia Beach, Virginia; Norfolk Naval Shipyard, Portsmouth, Virginia; Shipyard – Newport News, Virginia Broad Bay; York River; James River and Tributaries	Hampton Roads Intrastate	Attainment of all applicable standards
Cooper River; Charleston Pier, South Carolina	Charleston County	Attainment of all applicable standards
Naval Submarine Base Kings Bay, Georgia	Camden County	Attainment of all applicable standards
Naval Station Mayport, Jacksonville, Florida; St. John's River, Florida	Duval County	Attainment of all applicable standards
Port Canaveral, Cape Canaveral, Florida	Brevard County	Attainment of all applicable standards
Saint Andrews Bay, Florida	Bay County	Attainment of all applicable standards
Shipyard – Pascagoula, Mississippi	Jackson County	Attainment of all applicable standards

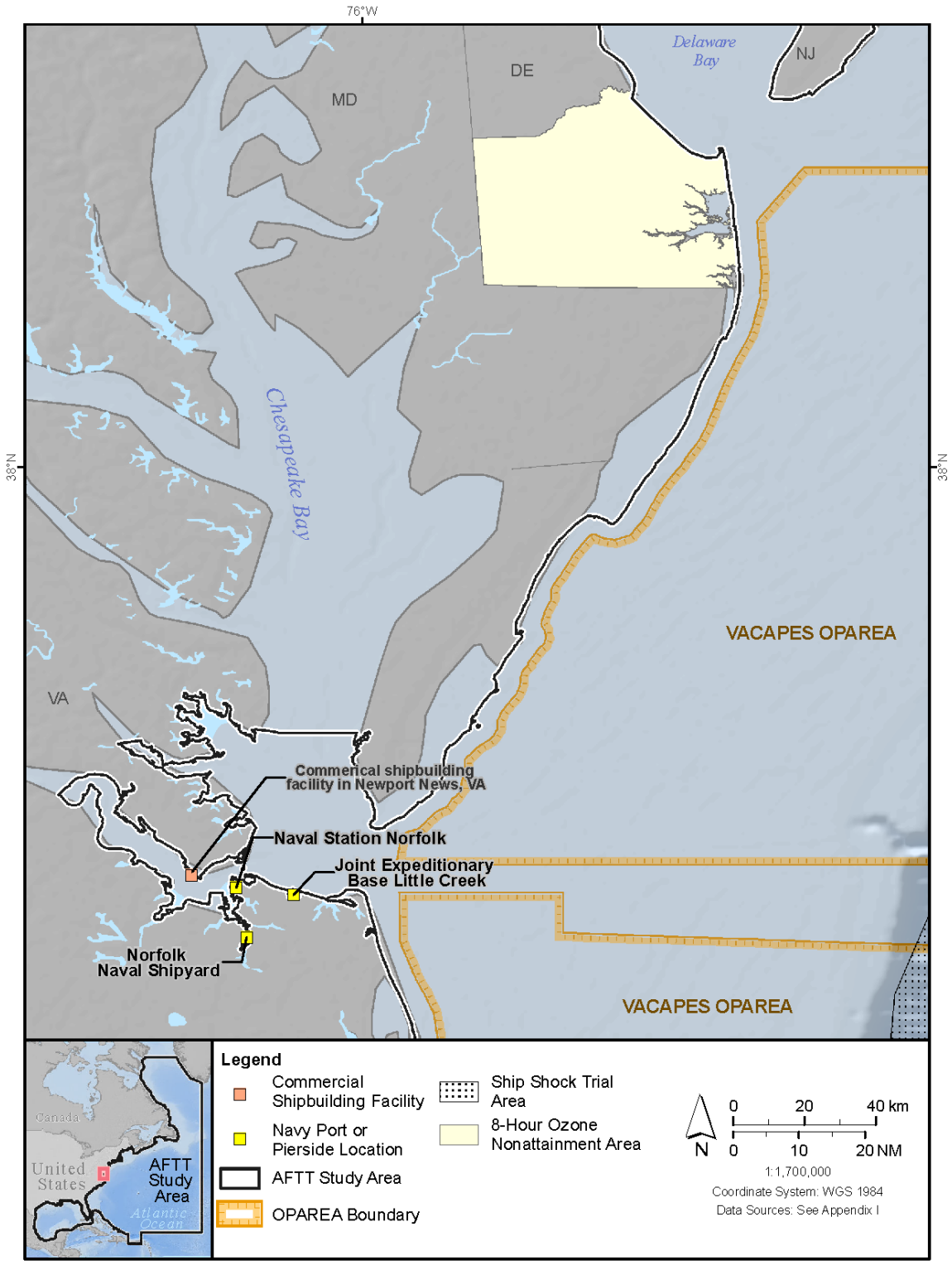
Source: 40 CFR part 81, Subpart C and Green Book Nonattainment and Maintenance Areas (U.S. Environmental Protection Agency, 2017)

Figure 3.1-1 through Figure 3.1-4 show the nonattainment and maintenance areas that are within or adjacent to the AFTT operational area.



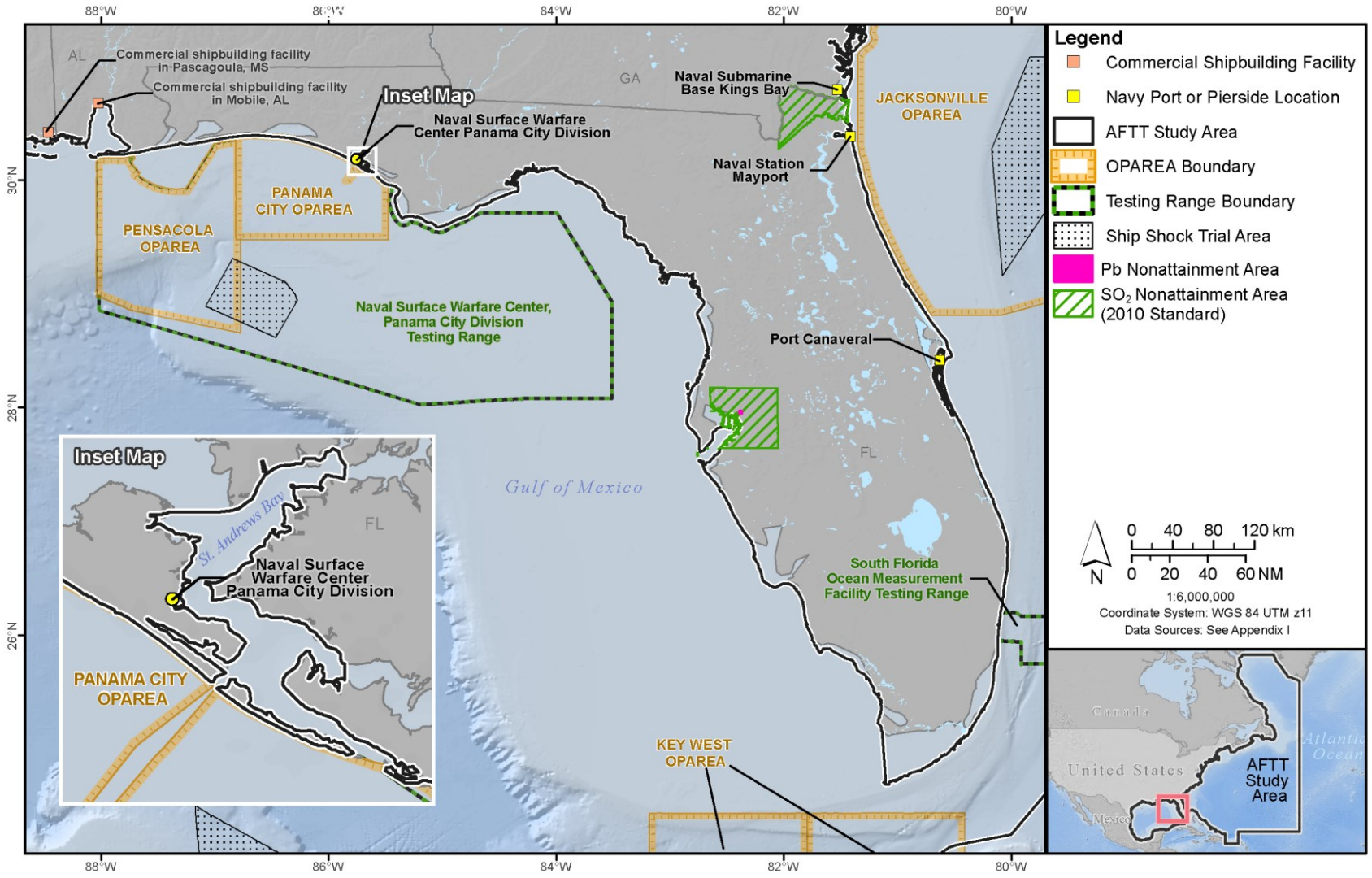
Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operation Area; $PM_{2.5}$: particulate matter less than or equal to 2.5 microns in diameter; PM_{10}: particulate matter less than or equal to 10 microns in diameter.

Figure 3.1-1: Applicable Nonattainment and Maintenance Areas in USEPA Region 1 and 2



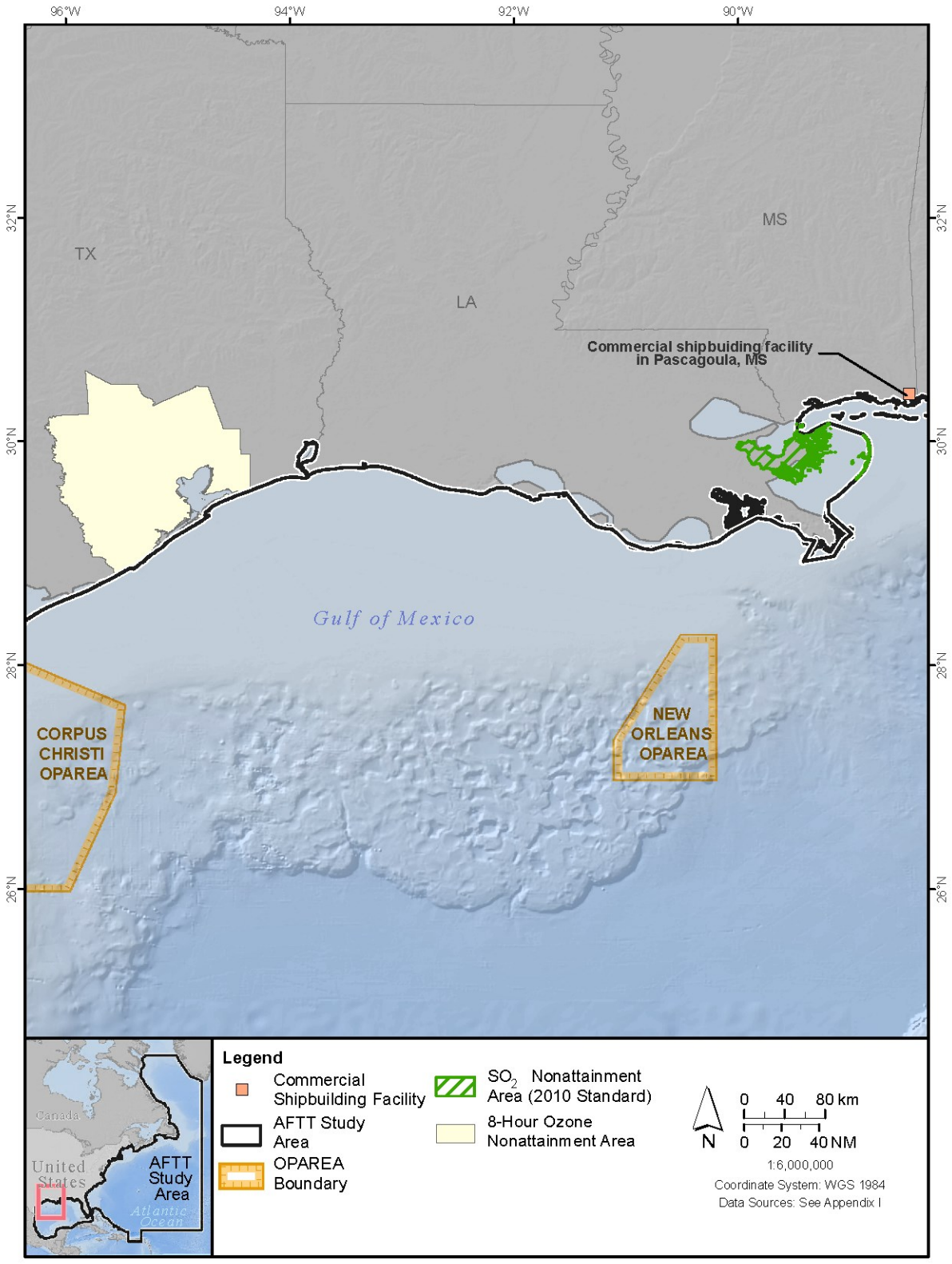
Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operation Area; $PM_{2.5}$: particulate matter less than or equal to 2.5 microns.

Figure 3.1-2: Applicable Nonattainment and Maintenance Areas in USEPA Region 3



Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operation Area; SO_2: sulfur dioxide; Pb: lead.

Figure 3.1-3: Applicable Nonattainment and Maintenance Areas in USEPA Region 4



Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operation Area. SO_2: sulfur dioxide

Figure 3.1-4: Applicable Nonattainment and Maintenance Areas in USEPA Region 6

3.1.2.3.1 Other Air Basins Adjacent to the Study Area

A substantial portion (over 70 percent) of all AFTT EIS/OEIS training and testing activities occur within these range complexes, which are adjacent to coastal attainment areas but located beyond state waters. The remaining 30 percent are largely conducted well offshore and a small percentage is performed in areas offshore of coastal nonattainment or maintenance areas. These areas include stretches of coastal areas of the northeast, areas adjacent to Nassau County, Florida, the Tampa area, the New Orleans area, and coastal areas around Houston. The migration of emissions from off-shore sources to land is well-documented. In 1997, the International Maritime Organization adopted Annex VI, Regulations for the Prevention of Air Pollution from Ships. These regulations were instituted for the commercial maritime industry due to recognition of the impact of vessel emissions, which can travel hundreds of miles, on coastal receptors and further inland. These emissions are particularly significant around the large ports on the coast of the US, which include New York/New Jersey, Philadelphia, Baltimore, Norfolk, Charleston, Savannah, Jacksonville, Miami, South Louisiana, and Houston, (U.S. Maritime Administration, 2016).

In addition to the OPAREAs and other areas further out to sea, there are also activities that occur within state waters. Vessels traverse state water during ingress/egress to OPAREAs and other Study Area locations further afield. There are also training activities in particular that occur in coastal areas, including riverine and bay locations. The area of greatest activity is in the lower Chesapeake Bay and in tributaries to the Bay, primarily the James and York Rivers in Virginia. Activities in Narragansett Bay are associated with the Naval Undersea Warfare Center, Newport Rhode Island. Additional areas where training or testing occurs within state waters include the St. Johns River near Naval Station Mayport FL, Port Canaveral FL, St. Andrews Bay near Naval Support Activity Panama City FL and the Cooper River near Charleston, SC. Of these, only Naval Station Mayport is located in an Air Quality Control Region with a nonattainment designation within its borders.

3.1.3 Environmental Consequences

This section evaluates how and to what degree the activities described in Chapter 2 (Description of Proposed Action and Alternatives) potentially impact air quality within the Study Area. Table 3.1-4 to Table 3.1-7 present the total emissions for the baseline and proposed training and testing activity locations under each alternative. The air quality stressors vary in intensity, frequency, duration, and location within the Study Area. The stressors applicable to air quality in the Study Area are analyzed below and include the following:

- **Criteria Air Pollutants**

In this analysis, criteria air pollutant emissions estimates were calculated for vessels, aircraft, and munitions. For each alternative, emissions estimates were developed by range complex and other training or testing locations and totaled for the Study Area. Additionally, state waters emissions are separately analyzed for air quality impacts. Details of the emission estimates are provided in Appendix C (Air Quality Emissions Calculations and Record of Non- Applicability). Hazardous air pollutants are analyzed qualitatively in relation to the prevalence of the sources emitting hazardous air pollutants during training and testing activities.

3.1.3.1 Criteria Air Pollutants

The potential impacts of criteria air pollutants are evaluated by first estimating the emissions from training and testing activities in the Study Area for each alternative. These estimates are then used to

determine the potential impact of the emissions on the attainment status of the adjacent designated air quality area. For a nonattainment or maintenance area, this involves evaluating the net change in emissions that would result from implementing the Proposed Action, as compared to current emissions, which are classified as the baseline emissions for the purpose of this analysis. The net change is then compared to published *de minimis* thresholds to assess compliance. The baseline emissions are defined as the emissions estimated for the Preferred Alternative that was proposed in the 2013 Atlantic Fleet Training and Testing Final Environmental Impact Statement / Overseas Environmental Impact Statement. Emissions of criteria air pollutants may affect human health directly by degrading local or regional air quality or indirectly by their effects on the environment. Air pollutant emissions may also have a regulatory effect separate from their physical effect, if additional air pollutant emissions change the attainment status of an air quality control region.

The estimate of criteria air pollutant emissions for each alternative is categorized by region (e.g., by range complex or testing range) so that differences in background air quality, atmospheric circulation patterns, regulatory requirements, and sensitive receptors can be addressed. An overall estimate of air pollutant emissions for Navy training and testing activities in the Study Area under each alternative is also provided. Under Alternative 1, emissions were based on the average number of training and testing activities anticipated, based on the prior 6 years of data. Under Alternative 2, emissions were based on the anticipated maximum number of training and testing activities. For vessel operations, the maximum was based on the operations that occurred in 2011 the year of the highest number of operations in the range 2010 – 2015. While this represented the year of most total operations, the number of operations involving specific vessels in the individual operational areas may or may not have been higher than the average number used in Alternative 1. These individual variances do not change the overall result of greater total operations when accounting for all vessels in all regions under Alternative 2.

3.1.3.1.1 Impacts from Criteria Pollutant Emissions under Alternative 1

Table 3.1-5 presents the total estimated emission results under Alternative 1 for each operational region in the Study Area and includes all emissions generated, regardless of proximity to the coastline. Most of these emissions occur beyond state waters, with the majority of emissions in most areas occurring beyond the state water boundaries. For Virginia Capes OPAREA, the use of vessels within the state waters is up to 2%, and in the Jacksonville OPAREA, the use of vessels within state waters is up to 1%.

The subsections that follow evaluate the emission in state waters within the Study Area that include nonattainment or maintenance areas.

Table 3.1-5: Estimated Annual Air Pollutant Emissions from Activities Occurring within the AFTT Study Area, Alternative 1

Range Complex	*Emissions by Air Pollutant (TPY)*					
	VOC	*CO*	*NO_X*	*SO_X*	*PM_{10}*	*$PM_{2.5}$*
Northeast	6.94	45.59	275.06	56.28	14.52	14.52
Virginia Capes	128.06	1,128.22	3,961.83	1,075.04	209.23	209.23
Cherry Point	40.13	343.83	891.52	169.00	41.72	41.72
Jacksonville	48.76	490.23	1,109.36	313.03	75.06	75.06

Table 3.1-5: Estimated Annual Air Pollutant Emissions from Activities Occurring within the AFTT Study Area, Alternative 1 (continued)

Range Complex	*Emissions by Air Pollutant (TPY)*					
	VOC	*CO*	*NO_X*	*SO_X*	*PM_{10}*	*$PM_{2.5}$*
Key West	2.78	13.32	77.58	12.99	4.92	4.92
Gulf of Mexico	9.67	127.25	463.74	116.05	25.83	25.83
Outside Range Complex Areas	53.64	332.74	1,683.07	383.46	55.59	55.59

Notes: CO: carbon monoxide; NO_x: oxides of nitrogen; VOC: volatile organic compounds; SO_x: sulfur oxides; PM_{10}: particulate matter less than or equal to 10 microns in aerodynamic diameter; $PM_{2.5}$: particulate matter less than or equal to 2.5 microns in aerodynamic diameter; tpy: tons per year.

A significant portion of the Study Area activities would occur well offshore. While pollutants emitted in the Study Area under Alternative 1 may at times be carried ashore by winds, most training and testing activities would occur more than 12 NM offshore, and natural mixing would substantially disperse pollutants before they reach the coastal land mass. The contributions of air pollutants generated in the Study Area to the air quality in onshore areas are unlikely to measurably add to existing onshore pollutant concentrations because of the distances these offshore pollutants would be transported and their substantial dispersion during transport.

In addition to the activities occurring beyond territorial waters, there would be activities closer to shore and these were evaluated to assess local onshore impacts.

3.1.3.1.2 Impacts from Criteria Pollutant Emissions under Alternative 1 in Northeast Areas Designated Nonattainment or Maintenance

In the Northeast, the primary areas where air pollution has resulted in designation of nonattainment or maintenance areas lie in the New York-Northern New Jersey-Long Island, NY-NJ-CT Air Quality Control Region (U.S. Environmental Protection Agency, 1972) (see Figure 3.1-1) which is moderate nonattainment for ozone, a maintenance area for particulate matter less than or equal to 2.5 microns in diameter, and includes a maintenance area for particulate matter less than or equal to 10 microns in diameter. A portion of the Eastern Connecticut Intrastate Control Region is also designated as moderate nonattainment for ozone. A very small area of coastal New Hampshire is nonattainment for sulfur dioxide, and there is a small area of ozone nonattainment in the coastal counties of New Jersey as well as near the coast at Seaford, Delaware. Activities in state waters are not scheduled to occur in any of these nonattainment or maintenance areas. The primary location where state waters activities in this region do occur is at Naval Undersea Warfare Center Newport and Narragansett Bay, both of which are in Rhode Island, an area in attainment for all pollutants.

3.1.3.1.3 Impacts from Criteria Pollutant Emissions under Alternative 1 in Jacksonville Florida Areas Designated Nonattainment or Maintenance

In the Southeast, the area where air pollution has resulted in designation of a coastal nonattainment or maintenance area lies in the Nassau County, Florida, which is just north of Jacksonville (see Figure 3.1-3). Both of these counties are in the Jacksonville (Florida)-Brunswick (Georgia) Interstate Air Quality Control Region. A portion of Nassau County is nonattainment for sulfur dioxide. Table 3.1-6 presents the estimated state waters emissions and their relevance to applicable General Conformity thresholds.

Table 3.1-6: Estimated Net Change Annual Air Pollutant Emissions from Activities Occurring in State Waters in the Jacksonville, Florida Area, Alternative 1

	Emissions by Air Pollutant (TPY)					
	VOC	***CO***	***NO_X***	***SO_X***	***PM_{10}***	***$PM_{2.5}$***
Nassau FL SO2 Nonattainment Area						
Total Emissions from all Sources	1.85	8.34	63.03	11.39	1.91	1.91
Baseline	4.98	51.70	31.26	10.50	3.11	3.11
Net Change	-3.13	-43.36	31.76	0.89	-1.20	-1.20
General Conformity Thresholds	NA	NA	NA	100	NA	NA
Exceedance?	NA	NA	NA	No	NA	NA

Notes: Table includes criteria pollutant precursors (e.g., VOC). Individual values may not add exactly to total values due to rounding.
CO: carbon monoxide; NO_X: nitrogen oxides; $PM_{2.5}$: particulate matter less than or equal to 2.5 microns in diameter; PM_{10}: particulate matter less than or equal to 10 microns in diameter; SO_X: sulfur oxides; TPY: tons per year; VOC: volatile organic compounds

Sulfur dioxide emissions in state waters associated with AFTT activities would be below the General Conformity *de minimis* thresholds. As a result, no further analysis of conformity is required and a Record of Non-Applicability, located in Appendix C, was prepared in accordance with Navy guidance.

3.1.3.1.4 Impacts from Criteria Pollutant Emissions under Alternative 1 in the Gulf of Mexico Areas Designated Nonattainment or Maintenance

In the Gulf of Mexico, the primary areas where air pollution has resulted in designation of nonattainment or maintenance areas lie in Hillsborough County, Florida (see Figure 3.1-1) which is nonattainment for sulfur dioxide and lead; Saint Bernard Parish, Louisiana, which is also nonattainment for sulfur dioxide; and the Houston-Galveston-Brazoria ozone nonattainment area. Activities in state waters are not scheduled to occur in any of these nonattainment or maintenance areas. The primary location where state water activities in this region do occur is at Naval Undersea Warfare Center Panama City, Florida which is in attainment for all pollutants.

3.1.3.1.5 Summary of Impacts from Criteria Pollutants under Alternative 1

While pollutants emitted in the Study Area under Alternative 1 may at times be carried ashore by prevailing winds, most training and testing activities would occur beyond state water boundaries and natural mixing would substantially disperse pollutants before they reach the boundaries of the adjacent air quality control regions. Additionally, the primary wind pattern moves from shore to offshore. The contributions of air pollutants generated in the Study Area to the air quality in the air quality control regions are unlikely to measurably add to existing onshore pollutant concentrations because of the distances these offshore pollutants would be transported and their substantial dispersion during transport. Therefore, no significant impacts on air quality as a result of criteria pollutants over state waters would occur; and no significant harm to air quality as a result of criteria pollutant emissions beyond state waters would occur.

3.1.3.1.6 Impacts from Criteria Pollutant Emissions under Alternative 2

Table 3.1-7 presents the total estimated emission results under Alternative 2 for each operational region in the Study Area and includes all emissions generated, regardless of proximity to the coastline. Most of these emissions occur beyond state waters. For Virginia Capes OPAREA, the use of vessels within the state waters is greater than in other portions of the Study Area.

The subsections that follow evaluate the state waters emissions within the regional areas that include nonattainment or maintenance areas. These emissions are compared to the General Conformity *de minimis* thresholds, and are not specific to specific localities. This conservative approach, then, evaluates all nearshore emissions as potentially occurring in any of the applicable nonattainment or maintenance areas.

Table 3.1-7: Estimated Annual Air Pollutant Emissions from Activities Occurring within the AFTT Study Area, Alternative 2

	Emissions by Air Pollutant (TPY)					
	VOC	***CO***	***NO_X***	***SO_X***	***PM_{10}***	***$PM_{2.5}$***
Northeast	6.37	46.75	252.28	48.26	16.90	16.90
Virginia Capes	124.05	1,124.25	4,232.97	1,161.70	353.96	353.96
Cherry Point	29.41	180.79	793.93	190.95	38.81	38.81
Jacksonville	60.49	607.27	2,033.74	546.75	92.58	92.58
Key West	0.92	15.32	30.75	10.59	3.18	3.18
Gulf of Mexico	3.04	32.06	106.10	27.02	14.44	14.44
Outside Range Complex Areas	162.29	569.59	4,160.17	656.71	90.15	90.15

Notes: CO: carbon monoxide; NO_x: oxides of nitrogen; VOC: volatile organic compounds; SO_x: sulfur oxides; PM_{10}: particulate matter less than or equal to 10 microns in aerodynamic diameter; $PM_{2.5}$: particulate matter less than or equal to 2.5 microns in aerodynamic diameter; tpy: tons per year.

A significant portion of the Study Area activities would occur well offshore. While pollutants emitted in the Study Area under Alternative 2 may at times be carried ashore by winds, most training and testing activities would occur more than 12 NM offshore, and natural mixing would substantially disperse pollutants before they reach the coastal land mass. The contributions of air pollutants generated in the Study Area to the air quality in onshore areas are unlikely to measurably add to existing onshore pollutant concentrations because of the distances these offshore pollutants would be transported and their substantial dispersion during transport.

In addition to the activities occurring beyond territorial waters, there would be activities closer to shore and these were evaluated to assess local onshore impacts.

3.1.3.1.7 Impacts from Criteria Pollutant Emissions under Alternative 2 in Northeast Areas Designated Nonattainment or Maintenance

In the Northeast, the primary areas where air pollution has resulted in designation of nonattainment or maintenance areas lies in the New York-Northern New Jersey-Long Island, NY-NJ-CT Air Quality Control Region (U.S. Environmental Protection Agency, 1972) (see Figure 3.1-1) which is moderate nonattainment for ozone, a maintenance area for particulate matter less than or equal to 2.5 microns in diameter, and includes a maintenance area for particulate matter less than or equal to 10 microns in diameter. A portion of the Eastern Connecticut Intrastate Control Region is also designated as moderate nonattainment for ozone. A very small area of coastal New Hampshire is nonattainment for sulfur dioxide, and there is a small area of ozone nonattainment near the coast at Seaford, Delaware. State waters activities are not scheduled to occur in any of these nonattainment or maintenance areas. The primary location where state waters activities in this region do occur is at Naval Undersea Warfare

Center Newport and Narragansett Bay, both of which are in Rhode Island, an area in attainment for all pollutants.

3.1.3.1.8 Impacts from Criteria Pollutant Emissions under Alternative 2 in Jacksonville Florida Areas Designated Nonattainment or Maintenance

In the Southeast, the area where air pollution has resulted in designation of a coastal nonattainment or maintenance area lies in the Nassau County, Florida, which is just north of Jacksonville (see Figure 3.1-3). Both of these counties are in the Jacksonville (Florida)-Brunswick (Georgia) Interstate Air Quality Control Region. A portion of this county is nonattainment for sulfur dioxide. Table 3.1-8 presents the estimated nearshore emissions and their relevance to applicable General Conformity thresholds.

Table 3.1-8: Estimated Annual Air Pollutant Emissions from Activities Occurring within 3 NM of shore in the Jacksonville, Florida Area, Alternative 2

	Emissions by Air Pollutant (TPY)					
	VOC	***CO***	***NO_X***	***SO_X***	***PM_{10}***	***$PM_{2.5}$***
Nassau FL SO_2 Nonattainment Area						
Total Emissions from all Sources	2.04	11.29	69.05	12.58	2.21	2.04
Baseline	4.98	51.70	31.26	10.50	3.11	3.11
Net Change	-2.94	-40.41	37.79	2.09	-0.90	-0.90
General Conformity Thresholds	NA	NA	NA	100	NA	NA
Exceedance?	NA	NA	NA	No	NA	NA

Notes: Table includes criteria pollutant precursors (e.g., VOC). Individual values may not add exactly to total values due to rounding.
CO: carbon monoxide; NO_X: nitrogen oxides; $PM_{2.5}$: particulate matter less than or equal to 2.5 microns in diameter; PM_{10}: particulate matter less than or equal to 10 microns in diameter; SO_X: sulfur oxides; TPY: tons per year; VOC: volatile organic compounds

Sulfur dioxide emissions in state waters that are associated with AFTT activities would be below the General Conformity *de minimis* thresholds. As a result, no further analysis of conformity is required and a Record of Non-Applicability, located in Appendix C, was prepared in accordance with Navy guidance.

3.1.3.1.9 Impacts from Criteria Pollutant Emissions under Alternative 2 in the Gulf of Mexico Adjacent Areas Designated Nonattainment or Maintenance

In the Gulf of Mexico, the primary areas where air pollution has resulted in designation of nonattainment or maintenance areas lie in Hillsborough County, Florida (see Figure 3.1-1) which is nonattainment for sulfur dioxide and lead; Saint Bernard Parish, Louisiana, which is also nonattainment for sulfur dioxide; and the Houston-Galveston-Brazoria ozone nonattainment area. State waters activities are not scheduled to occur in any of these nonattainment or maintenance areas. The primary location where state waters activities in this region do occur is at Naval Undersea Warfare Center Panama City, Florida which is in attainment for all pollutants.

State waters emissions associated with AFTT activities would all be below the General Conformity *de minimis* thresholds. As a result, no further analysis of conformity is required and a Record of Non-Applicability, located in Appendix C, was prepared in accordance with Navy guidance. .

3.1.3.1.10 Summary of Impacts from Criteria Pollutants under Alternative 2

While pollutants emitted in the Study Area under Alternative 2 may at times be carried ashore by prevailing winds, most training and testing activities would occur more than 3 NM offshore, and natural mixing would substantially disperse pollutants before they reach the boundaries of the adjacent air

quality control regions. The contributions of air pollutants generated in the Study Area to the air quality in the air quality control regions are unlikely to measurably add to existing onshore pollutant concentrations because of the distances these offshore pollutants would be transported and their substantial dispersion during transport.

3.1.3.1.11 Impacts from Criteria Pollutants under the No Action Alternative

Under the No Action Alternative, training and testing activities associated with the Proposed Action would not be conducted within the AFTT Study Area. Discontinuing training and testing activities in the Study Area under the No Action Alternative would not measurably improve air quality in the Study Area because of the discontinuous nature of the events that constitute the Proposed Action and the fact that most of the air emissions that are generated occur at sea over a wide geographic area. The elimination of the air emissions associated with training activities in the lower Chesapeake Bay and its tributaries may be beneficial to local air quality in this region because it is the area of highest activity in state waters. It should be noted that the air quality in this area already surpasses the National Ambient Air Quality Standards.

3.1.3.2 Greenhouse Gases and Climate Change

Activities conducted as part of the Proposed Action would involve mobile sources using fossil fuel combustion as a source of power. Additionally, the expenditure of munitions could generate greenhouse gas emissions. While the emissions generated by testing and training activities alone would not be enough to cause global warming, in combination with past and future emissions from all other sources they would contribute incrementally to the global warming that produces the adverse effects of climate change.

Greenhouse gas emissions for all of the testing and training activities occurring annually throughout the entire Study Area were calculated using emissions factors provided by the U.S. Navy for aircraft and vessels, and published by the USEPA for munitions. The analysis of greenhouse gas emissions associated with aircraft is limited to those emissions below 3,000 ft. because there is insufficient historical data to document the entire flight path or flight duration of any given aircraft for a specific training or testing event. This is also true for the baseline data so that the totals for the baseline, Alternative 1 and Alternative 2 are comparable. A net decrease in greenhouse gas emissions would be anticipated compared to the baseline estimate, with the largest decrease associated with Alternative 1, as indicated in Table 3.1-9.

Table 3.1-9: Total Greenhouse Gas Emissions from All Study Area Training and Testing Activities

Alternative	*Annual CO_2 Emissions in Metric Tons/Year*
Baseline	1,360,794
Alternative 1	1,088,429
Net Change	-272,364
Alternative 2	1,296,256
Net Change	-64,538

3.1.4 SUMMARY OF POTENTIAL IMPACTS ON AIR QUALITY

In this analysis, criteria air pollutant and greenhouse gas emissions estimates were calculated for vessels, aircraft, and munitions. For each alternative, emissions estimates were developed by range

complex and other training or testing locations and totaled for the Study Area. Details of the emission estimates are provided in Appendix C (Air Quality Emissions Calculations and Example Record of Non-Applicability). Hazardous air pollutants were analyzed qualitatively in relation to the type and prevalence of the sources emitting hazardous air pollutants during training and testing activities.

3.1.4.1 Combined Impacts of All Stressors under Alternative 1

As discussed in Section 3.1.3.1 (Criteria Air Pollutants), emissions associated with Study Area training and testing activities under Alternative 1 primarily occur beyond the boundary for state waters. For fixed-wing aircraft activities, emissions typically occur above the 3,000-ft. mixing layer. Given these characteristics, the impact on air quality from the combination of these resource stressors are expected to be similar to the impacts on air quality for any of these stressors taken individually without any additive synergistic, or antagonistic interaction. A comparison of estimated emissions under Alternative 1 to the baseline indicates that some pollutant emissions would be reduced and others would increase. Emissions of VOCs remain largely static, and PM emissions would undergo a small increase. Carbon monoxide and greenhouse gases would decrease substantially. Nitrogen oxides and sulfur dioxide would increase. A significant cause of the increase in nitrogen oxide and sulfur dioxide emissions is due to the inclusion of more accurate data for riverine and bay testing and training activities, particularly in the Virginia environs. Because these activities were not well accounted for in the analyses presented in the 2013 Atlantic Fleet Training and Testing Final EIS/OEIS, it appears that there has been a sizeable increase. However, it is simply the result of better information and hence a more accurate accounting of what typically occurs in these areas.

3.1.4.2 Combined Impacts of All Stressors under Alternative 2

As discussed in Section 3.1.3.1 (Criteria Air Pollutants), emissions associated with Study Area training and testing activities under Alternative 2 primarily occur beyond the boundary for state waters. For fixed-wing aircraft activities, emissions typically occur above the 3,000-ft. mixing layer. Given these characteristics, the impact on air quality from the combination of these resource stressors are expected to be similar to the impacts on air quality for any of these stressors taken individually without any additive synergistic, or antagonistic interaction. A comparison of estimated emissions under Alternative 2 in comparison to the baseline indicates that some pollutants emissions would be reduced and others would increase. Emissions of VOCs remain largely static, and PM emissions would undergo a small increase. Carbon monoxide and greenhouse gases would decrease substantially. Nitrogen oxides and sulfur dioxide would increase. A significant cause of the increase in nitrogen oxide and sulfur dioxide emissions is due to the inclusion of more accurate data for riverine and bay testing and training activities, particularly in the Virginia environs. Because these activities were not well accounted for in the analyses presented in the 2013 Atlantic Fleet Training and Testing Final EIS/OEIS, it appears that there has been a sizeable increase. However, it is simply the result of better information and hence a more accurate accounting of what typically occurs in these areas.

3.1.4.3 Combined Impacts of All Stressors under the No Action Alternative

As discussed in Sections 3.1.3.1 (Criteria Air Pollutants), training and testing activities associated with the Proposed Action would not be conducted within the AFTT Study Area.

Discontinuing training and testing activities in the Study Area under the No Action Alternative would not measurably improve air quality in the Study Area because of the discontinuous nature of the events that constitute the Proposed Action and the fact that most of the air emissions that are generated occur at sea over a wide geographic area. The elimination of the air emissions associated with training activities

in the lower Chesapeake Bay and its tributaries may be beneficial to local air quality in this region because it is the area of highest activity in state waters. It should be noted that the air quality in this area already surpasses the National Ambient Air Quality Standards.

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