

UNITED STATES COAST GUARD

Port Access Route Study:
Seacoast of North Carolina Including
Approaches to the Cape Fear River and
Beaufort Inlet, North Carolina

Final Report

Docket Number USCG-2020-0093

**USCG-2020-0093 Port Access Route Study:
Seacoast of North Carolina including
approaches to the Cape Fear River and
Beaufort Inlet, North Carolina**

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A. Executive Summary

The Port Access Route Study for the Seacoast of North Carolina (NCPARS) analyzes navigation routes to/from the major ports of Wilmington and Morehead City, North Carolina, and the proposed fairways outlined in the Shipping Safety Fairways along the Atlantic Coast Advance Notice of Proposed Rulemaking (ANPRM). The Fifth Coast Guard District reviewed ten years of search and rescue and marine casualty data in the study area, considered current routing measures, potential Offshore Renewable Energy Installations (OREI), a detailed traffic analysis of National Automated Information System (NAIS) vessel data, and the shipping safety fairways proposed under the Advance Notice of Proposed Rulemaking (ANPRM) for Shipping Safety Fairways along the Atlantic Coast. The study area extends approximately 200 nautical miles seaward of Cape Fear, including the offshore area of North Carolina and South Carolina.

The Fifth Coast Guard District considered public comments on a draft report before preparing this final report of study. A summary of comments is found in Section G. This final report will be submitted to Coast Guard Headquarters Office of Navigation Systems (CG-NAV) for consideration in potential rulemakings and/or international resolutions.

The findings of this study support shipping safety fairways between the port approaches to the Cape Fear River and Beaufort Inlet, North Carolina, and the ANPRM fairways. See Figure A.1 for a detailed illustration of these changes. Conclusions, contained in Section F, provide supporting analysis and a more detailed assessment of these recommendations as well as any other alternatives assessed. These recommendations seek to improve the marine transportation system and promote safe navigation, reconciling vessel activity with other waterway uses.

The Fifth Coast Guard District published a Notice of Study announcing this Port Access Route Study in 2020 85 Fed. Reg. 15487 (March 18, 2020). Throughout the NCPARS, the Coast Guard coordinated with federal, state, and local agencies where appropriate and considered the views of maritime community representatives, environmental groups, and other interested stakeholders. To the extent practicable, the study reconciled the need for safe access routes with other reasonable waterway uses. The Fifth Coast Guard District identified potential conflicts involving alternative activities in the study area, such as OREIs, military activities, anchorage practices, fishing, and passenger vessel activity. In addition to aiding the Coast Guard in establishing new or adjusting existing fairways or Traffic Separation Schemes (TSS), the report considered whether safety zones, security zones, recommended routes, or regulated navigation areas should be created.

The Coast Guard also studied international entry and departure transit areas seaward of the recommended fairways in the U.S. Exclusive Economic Zone where related to the Cape Fear River and Beaufort Inlet entrances. These international entry and departure transit areas are integral to the safe, efficient, and unimpeded flow of ships and the safe and direct movement of ships and cargo between international origins and destinations.

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B. Purpose and Authority

Under Section 70003 of Title 46 of the United States Code, the Commandant of the Coast Guard may designate necessary fairways and traffic separation schemes (TSSs) to provide safe access routes for vessels proceeding to and from U.S. ports. The designation of fairways and TSSs recognizes the paramount right of navigation over all other uses in the designated areas.

Before establishing or adjusting fairways or TSSs, the Coast Guard must conduct a PARS, i.e., a study of potential traffic density and the need for safe access routes for vessels. Through the study process, the Coast Guard must coordinate with federal, state, and foreign state agencies (as appropriate) and consider the views of maritime community representatives, environmental groups, and other interested stakeholders. The primary purpose of this coordination is, to the extent practicable, to reconcile the need for safe access routes with other reasonable waterway uses such as construction and operation of renewable energy facilities and other uses of the waters within the study area.

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C. Background

Area of Analysis

Figure C.1 is the study area, which is an area bounded by a line connecting the following geographic points.

- 75° 30' W 35° 19' N;
- 71° 16' W 35° 19' N;
- 74° W 32° N;
- 78° 40' W 32° 52' N;
- 79° 11' W 33° 12' N

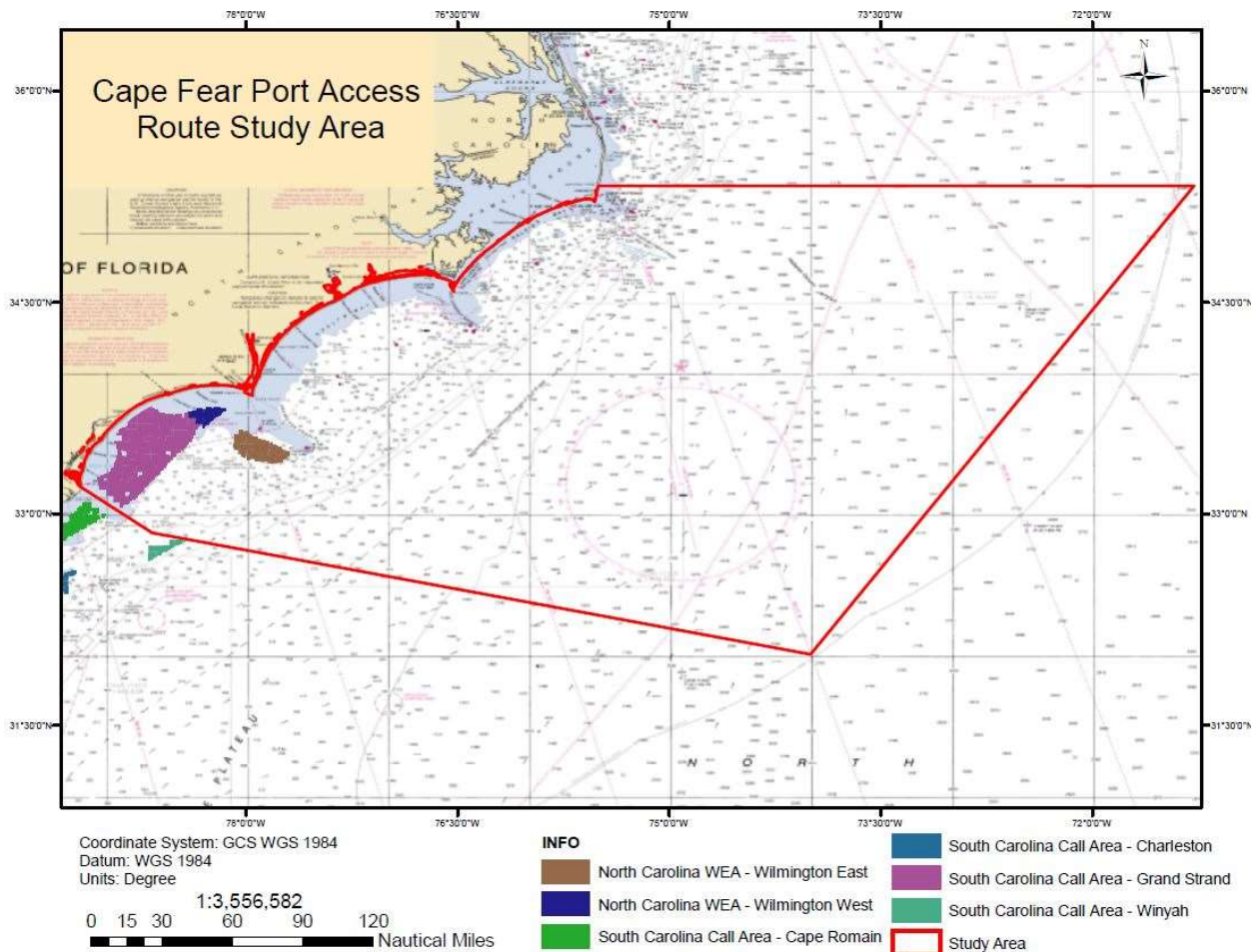


Figure C.1

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Previous Studies

The Coast Guard last studied the approaches to the Cape Fear River, North Carolina, in 2001 and published the results in 69 Fed. Reg. 68 (April 23, 2004). The 2001 PARS was conducted in response to port improvements and increased vessel traffic. The 2001 study was published in the Federal Register and resulted in the current TSS and a precautionary area, which includes a pilot boarding area, in the approach to the Cape Fear River. The study resulted in updates to international routing measures and domestic regulations.

In 2016, the Coast Guard published a notice of its Atlantic Coast Port Access Route Study (ACPARS), 81 Fed. Reg. 13307 (March 14, 2016) that analyzed Atlantic Coast waters seaward of existing port approaches within the U.S. Exclusive Economic Zone, and announced the report as final in 2017. See final report, 82 Fed. Reg. 16510 (April 5, 2017). This multi-year study began in 2011, included public participation, and evaluated potential navigational safety risks associated with developing offshore renewable energy installations (OREI). The ACPARS identified navigation safety corridors along the Atlantic Coast necessary to ensure safe navigation and recommended that they have priority consideration over other uses consistent with the United Nations Convention of the Law of the Sea (see figure C.2). The ACPARS also identified coastal navigation routes and safety corridors of an appropriate width for seagoing tows, and clarified the necessary sea space for vessels to maneuver in compliance with the International Regulations for Preventing Collisions at Sea (COLREGS) that led to the development of marine planning guidelines.¹ The ACPARS did not consider detailed navigation routes to or from ports or international routes destined for the United States that are integral to a safe and efficient transportation infrastructure.

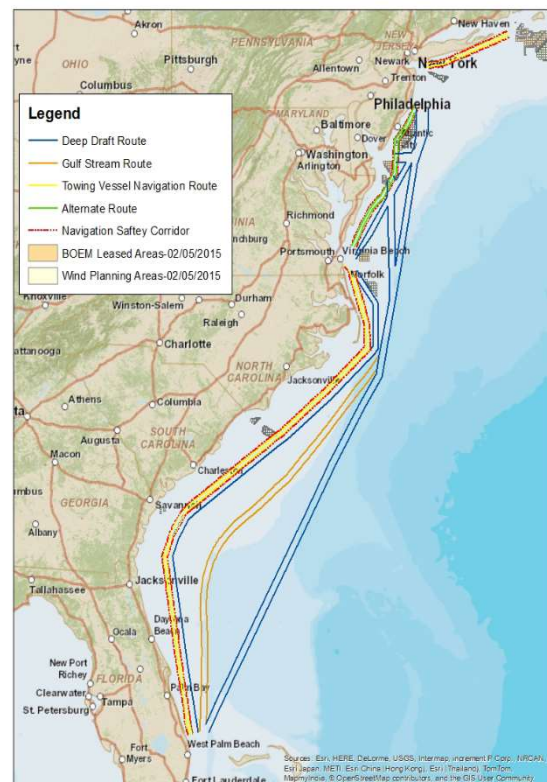


Figure C.1

¹ United States Coast Guard. Marine Planning Guidelines, 2019.

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In 2019, the Coast Guard announced a new study of routes used by ships to access ports on the Atlantic Coast of the United States. See Port Access Route Study, 84 Fed. Reg. 9541 (March 15, 2019). This new study of routes supplements and builds on the ACPARS by concentrating on the navigation routes to and from U.S. ports, and their interconnectedness to the Atlantic Coast routes. As part of the new study, the Coast Guard will conduct several PARS to examine East Coast ports that are economically significant and/or support military operations or critical national defense. This study examines the Seacoast of North Carolina including the approaches to the Cape Fear River and Morehead City, North Carolina and the interconnectedness to the Atlantic coast routes.

In 2020, the Coast Guard published an ANPRM in 85 Fed. Reg. 37034 (June 19, 2020) seeking public comment regarding the possible development of the navigation safety corridors identified in the ACPARS into shipping safety fairways. This rulemaking relates to this study in that it intends to implement the recommendations of the ACPARS, which this study supplements. Any routing measures proposed by this study may lead to future rulemakings or appropriate international agreements.

Study methodology

This study was conducted in accordance with Appendix D of the Coast Guard's *Marine Planning to Operate and Maintain the Marine Transportation System (MTS) and Implement National Policy, Commandant Instruction 16003.2B*²

Consultations and Outreach Efforts

Throughout this study, the Coast Guard coordinated with other governmental agencies and considered the views of maritime community representatives, environmental groups, and interested stakeholders.

Prior to announcing the study and with the intent to aid public review and participation, the Fifth District worked with the Mid-Atlantic Regional Council on the Ocean³ to make the study area available on the Mid-Atlantic Ocean Data Portal at <http://portal.midatlanticocean.org/visualize/>.⁴

A Federal Register "Notice of study; request for comments" (USCG-2020-0093) was published in the Federal Register on March 18, 2020. Two comments, plus one duplicative comment, were made to the docket. One comment regarded environmental concerns for marine mammals in the study area, which is outside the scope of a PARS. The other supported the creation of the ACPARS shipping safety fairways.

² Instruction available at https://media.defense.gov/2019/Jul/10/2002155400/-1/-1/0/CI_16003_2B.PDF.

³ See <https://www.midatlanticocean.org/>.

⁴ See the "Maritime" portion of the Data Layers section.

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From March 24, 2020 through May 18, 2020, the Fifth Coast Guard District advertised the study in the Local Notice to Mariners, which is distributed to more than 5,000 subscribers and is publicly available on the Coast Guard Navigation Center's website, www.navcen.uscg.mil.

On March 18, 2020, Coast Guard Sector North Carolina issued an e-mail to over 180 port partners to further disseminate announcement of the study.

The Fifth Coast Guard District reviewed and discussed the data and analysis for this study with various key stakeholders. These include but are not limited to:

North Carolina Department of Environmental Quality
South Carolina Department of Environmental Quality
National Weather Service

U.S. Army Corps of Engineers: Wilmington District – Timothy Jones, Jeremiah Smith
U.S. Military Ocean Terminal Sunny Point (MOTSU) – Malcolm Charles
U.S. Fleet Forces (DoD) – Jim Casey and Joe Atangan

The Fifth Coast Guard District reviewed the public comments provided to the Draft report prior to finalizing this report.

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D. Key Port and Waterway Features

Major Ports

The study area contains two major deep draft commercial ports, the Port of Wilmington and the Port of Morehead City, North Carolina. Wilmington and Morehead City are both commercial, strategic sealift ports as designated by the National Port Readiness Network. Commercial cargo vessel traffic is operated through facilities owned and operated by the North Carolina Port Authority, an enterprise agency for the North Carolina Department of Transportation. These ports both hold significant local and nationwide economic importance. According to an internal 2018 economic study completed by the North Carolina Port Authority, the two ports yielded \$15.4 billion in output to the state, supported 87,700 jobs, and generated \$637 million in tax revenue⁵. In total, the two ports saw 6.7 million tons of goods move through the port valued at \$21.5 billion dollars.

The Port of Morehead City, North Carolina

The Port of Morehead City handles general bulk and break bulk cargo. The port complex includes 128 acres of facilities, one cargo crane, a rail-car cargo dump, and nine deep-draft berths⁶. Morehead City provides access to railroads and U.S. highways. The Intracoastal Waterway runs through Morehead City, providing routes for commercial and recreational inland watercraft. There is no air draft restriction on this port. The port is the closest deep-water port to the United States Marine Corps Base - Camp Lejeune. United States Navy owned berths at Radio Island serve as an embarkation and debarkation point for deployments⁷. The Outer Entrance Channel is authorized to a project depth of 47 feet plus two feet over depth.

The top five imports by tonnage are direct-reduced iron, scrap metal, agricultural goods, rubber, and lumber. The top five exports by tonnage are phosphate, oyster rock, woodchips, military equipment, and aerospace equipment. In 2017 and 2018, Morehead City moved 1.65 million tons of goods worth \$1.5 billion dollars.

The Port of Wilmington, North Carolina

Located 26 miles from sea up the Cape Fear River, Wilmington, North Carolina, is the largest port in the study area, with facilities spanning 284 acres. The Port has nine deep-draft berths and

⁵ Findley, Head, et al. North Carolina State Port Authority, 2019, North Carolina Ports 2018 Economic Impact Study.

⁶ "Port of Morehead City." NC Ports, North Carolina Ports Authority, www.ncports.com/port-facilities/port-of-morehead-city/.

⁷ Pike, John. "Morehead City, NC." GlobalSecurity.org, GlobalSecurity.org, www.globalsecurity.org/military/facility/morehead-city.htm.

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a 600,000 twenty-foot equivalent container unit (TEU) capacity terminal with seven container cranes. Cargo has access to both railroads and U.S. highways. Additionally, the Port of Wilmington has ten other facilities receiving deep draft vessels. The Military Ocean Terminal Sunny Point (MOTSU) is downriver from Wilmington and also draws deep-draft traffic to the Cape Fear River Channel, including military cargo vessels and warships⁸.

The North Carolina State Ports Authority is advocating for the deepening of the Port of Wilmington Harbor. The United States Army Corps of Engineers (USACE) conducted an Environmental Analysis resulting in a Finding of No Significant Impact (FONSI) for widening, but the Environmental Impact Statement for a deepening project is not yet complete. The current authorized navigation channel depth is 44-feet. The USACE must complete the Environmental Impact Study to comply with the National Environmental Policy Act (NEPA) and prepare the cost of maintenance before appropriations are made.

The top five imports are chemicals, fertilizers, agricultural goods, equipment/machinery, and forest products. The top five exports are wood pellets, forest products, wood chips, general merchandise, and food. In 2017 and 2018, Wilmington moved 5 million tons of goods valued at \$17.65 billion dollars⁹. In the past five years, capital improvements to infrastructure have been made, to include air draft improvements, Neo-Panamax cranes, and berth expansions. These improvements, along with turning basin and channel dredging, are aimed at increasing the container trade to accommodate Ultra Large Container Vessels more frequently in the future¹²

Military Installations

U.S. Marine Corps (USMC)

Marine Corps Base (MCB) Camp Lejeune

Camp Lejeune is a 246-square mile training facility near Jacksonville, North Carolina, that promotes combat readiness of the operating forces. It also supports the missions of other tenant commands by providing training venues, facilities, services, and support in order to be responsive to the needs of Marines, sailors, and their families. The large complex is home to several units and commands spread out over the main base and satellite installations in the immediate areas: Marine Corps Air Station New River, Camp Geiger, Stone Bay, Courthouse

⁸“ Port of Wilmington” NC Ports, North Carolina Ports Authority, www.ncports.com/port-facilities/port-of-morehead-city/.

⁹ Findley, Head, et al. North Carolina State Port Authority, 2019, North Carolina Ports 2018 Economic Impact Study.

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Bay, Camp Johnson, and the latest addition to the facility, the Greater Sandy Run Training Area¹⁰.

Marine Corps Air Station (MCAS) Cherry Point

MCAS Cherry Point is a 29,000 acre facility, which employs approximately 14,000 Marines, Sailors and civilian employees. It provides air traffic control services covering more than 9,000 square miles of airspace for military, civil and commercial air traffic¹¹.

Marine Corps Air Station (MCAS) New River

MCAS New River performs the aviation function for MCB Lejeune. MCAS New River provides a variety of fixed and rotary aircraft for training and exercises¹².

U.S. Army

Military Ocean Terminal Sunny Point (MOTSU)

Located on the Cape Fear River, near the Port of Wilmington, MOTSU is the largest ammunition port in the nation. Operated by the Army's Surface Deployment and Distribution Command, it is the Department of Defense's (DOD) primary ammunition seaport supporting the European, African, and Middle Eastern areas of operation. With a workforce of approximately 350 civilians, contractors and military personnel, the installation includes three wharves and incorporates a network of railroad tracks to move munitions across the area. This infrastructure allows the seamless transfer of munitions between rail, trucks and ships. MOTSU stores and ships DOD ammunition, dangerous cargo and explosives, including small arms ammunition; artillery shells, fuses and propellants, ammunition for vehicle systems, and aircraft bombs and ammunition¹³.

U.S. Coast Guard

Several different Coast Guard commands and assets conduct operations in the study area. Commander, Fifth Coast Guard District; Commander, Seventh Coast Guard District; and Commander, Coast Guard Atlantic Area, are headquartered outside the study area. Their staffs,

¹⁰ Economic Development Partnership for North Carolina, webinar, July 15,2020. Found at Economic Development Partnership of North Carolina Webinar, July 15, 2020. Found at <https://register.gotowebinar.com/recording/9053498998150250255>.

¹¹ <https://www.cherrypoint.marines.mil/About/>

¹² <https://www.newriver.marines.mil/>

¹³ <https://www.sddc.army.mil/596th/Pages/MOTSU.aspx>

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including a 24-hour command center, are located in the Portsmouth Federal Building in Portsmouth, Virginia, and Miami, Florida.

Coast Guard commands and assets located in proximity to the study area, who conduct operations within the study area, are as follows:

Commander, Coast Guard Atlantic Area

Nine 270' medium endurance cutters are currently homeported in Portsmouth, VA.

- USCGC BEAR
- USCGC SENECA
- USCGC HARRIET LANE
- USCGC FORWARD
- USCGC TAMPA
- USCGC LEGARE
- USCGC NORTHLAND
- USCGC ESCANABA
- USCGC SPENCER

Two 210' medium endurance cutters are located at Joint Base Little Creek in Virginia Beach, VA.

- USCGC VIGOROUS
- USCGC DEPENDABLE

Commander, Force Readiness Command (FORCECOM):

The Special Missions Training Center (SMTC) is a Coast Guard training facility located on Camp Lejeune, North Carolina. Initially a training detachment for only expeditionary Port Security Units (PSUs), SMTC training requirements have steadily and significantly increased, with added responsibilities such as the Non-Lethal Weapons and Fast Boat Center of Excellence in 1999. SMTC conducts training missions throughout the study area.

Commander, Fifth Coast Guard District

Aid to Navigation Cutters and Construction Tenders homeported within the study area include:

- USCGC MAPLE– Ft. Macon, North Carolina
- USCGC SMILAX – Ft. Macon, North Carolina

Sentinel-class 154-foot fast response cutters homeported within the study area include:

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- USCGC NATHAN BRUCKENTHAL – Ft. Macon, North Carolina
- USCGC RICHARD SNYDER – Ft. Macon, North Carolina

Aid to Navigation Tenders that operate within the study area yet are homeported outside the area include:

- USCGC KENNEBEC– Portsmouth, VA

Operational units known as Sectors and Air Stations are subunits of the Commander, Fifth Coast Guard District. Sector Commands oversee search and rescue stations and 87' patrol boats. Air Stations house Search and Rescue aircraft and personnel.

Sector North Carolina

Sector North Carolina personnel are located in downtown Wilmington, North Carolina and Field Offices at Cape Hatteras and Fort Macon, North Carolina. Sector North Carolina sub-units include:

- Three Aids-To-Navigation Teams (Fort Macon, Oak Island, and Wanchese, North Carolina)
- Two Sector Field Offices (Cape Hatteras and Fort Macon, North Carolina)
- One 87' Coastal Patrol Boat: USCGC STEELHEAD – Fort Macon, North Carolina
- Eight multi-mission boat stations (Elizabeth City, Oregon Inlet, Hatteras Inlet, Hobucken, Fort Macon, Emerald Isle, Wrightsville Beach, and Oak Island, North Carolina)
- One 65' inland buoy tender: USCGC BAYBERRY – Oak Island, North Carolina

Air Station Elizabeth City

Air Station Elizabeth City personnel are located on Base Elizabeth City in Elizabeth City, North Carolina. Air Station assets include medium range MH-60 helicopters and long range C-130-J aircraft for search and rescue operations in the study area. The Atlantic Area and Fifth District Commanders direct aviation assets at the request of local Sector Commanders in support of SAR cases.

Like the Fifth Coast Guard District, the Seventh Coast Guard District has Sectors as subunits. Within the study area there is one Seventh Coast Guard District Sector.

Sector Charleston, SC

Sector Charleston personnel are located in downtown Charleston, South Carolina, and sub-units in the study area include:

- Station Georgetown

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- Aids to Navigation Team Georgetown

Seventh District Aids to Navigation Tenders that operate within the study area yet are homported outside the area include:

- USCGC WILLOW – Charleston, SC
- USCGC MARIA BRAY – Jacksonville, FL
- USCGC ANVIL – Charleston, SC

Military Operating Areas

Cherry Point Operating Area (CPOPAREA)

The CPOPAREA is a large geographic region in coastal waters offshore of North Carolina. Their mission is to provide sustainable and modernized ocean operating areas, airspace, ranges, range infrastructure, training facilities and resources to fully support naval training requirements. The CPOPAREA is centrally located between fleet concentration areas in Hampton Roads, Virginia and Jacksonville, Florida and the Marine Forces Atlantic concentration in North Carolina.

Fleet Area Control and Surveillance Facility, Virginia Capes, known as FACSFAC VACAPES is located at Naval Air Station Oceana in Virginia Beach, VA, and manages CPOPAREA. FACSFAC VACAPES controls Special Use Airspace (SUA), which consists of Warning and Restricted Areas, Military Operating Areas (MOA), Air Traffic Control Assigned Airspace (ATCAA), and Surface and Subsurface Operating Areas.

Navy and Marine Corps training occurs daily throughout the CPOPAREA. Events and activities include small, unit level training, up to large, full-scale exercise and certification events, consisting of Carrier and Expeditionary Strike Groups and accompanying air, surface, and submarine component tactical platforms and opposing force assets.

Testing and training throughout the CPOPAREA include a wide range of simulated, inert, and live fire weapons employment in support of all naval warfare missions and pre-deployment combat certification requirements. In summary, the CPOPAREA remains an invaluable resource in support of naval units assigned to and stationed within the Navy's fleet concentration area of Hampton Roads

Charleston Operating Area

The Charleston Operating Area lies offshore of Myrtle Beach, South Carolina, and is controlled by the 20th Operations Support Squadron, U.S. Air Force, Shaw Air Force Base, Sumter, South Carolina. This airspace encompasses approximately 4.8K square miles of airspace for military

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aircraft target and destroy training operating in six warning areas, and is utilized by Air Force, Navy, Marines and Coast Guard.

Charleston Operating Area supports a multitude of military training and civilian aircraft testing. This includes Boeing test/public affairs flights out of Charleston, Gulfstream test flights out of Savannah, F-18 pressurization tests, and navy air-to-surface threat training out of Beaufort Marine station. The area also supports large, full-scale exercises and certification events, consisting of carrier and expeditionary strike groups and accompanying air, surface, and submarine component tactical platforms and opposing force assets.

Daily testing and training throughout the area includes a wide range of simulated, inert, and live fire weapons employment in support of all naval/air force warfare missions and pre-deployment combat certification requirements.

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Offshore Renewable Energy Installations

The study area, shown in Figure D.1, includes three Wind Energy Areas (WEA) labeled as South Carolina Long Bay, Wilmington East, and Wilmington West. Details on the status of individual OREI projects and future lease areas in this report are subject to update as the projects proceed through the BOEM process. The Fifth Coast Guard District encourages the public to review the most updated status by visiting the public website for BOEM, <https://www.boem.gov/renewable-energy/state-activities>.

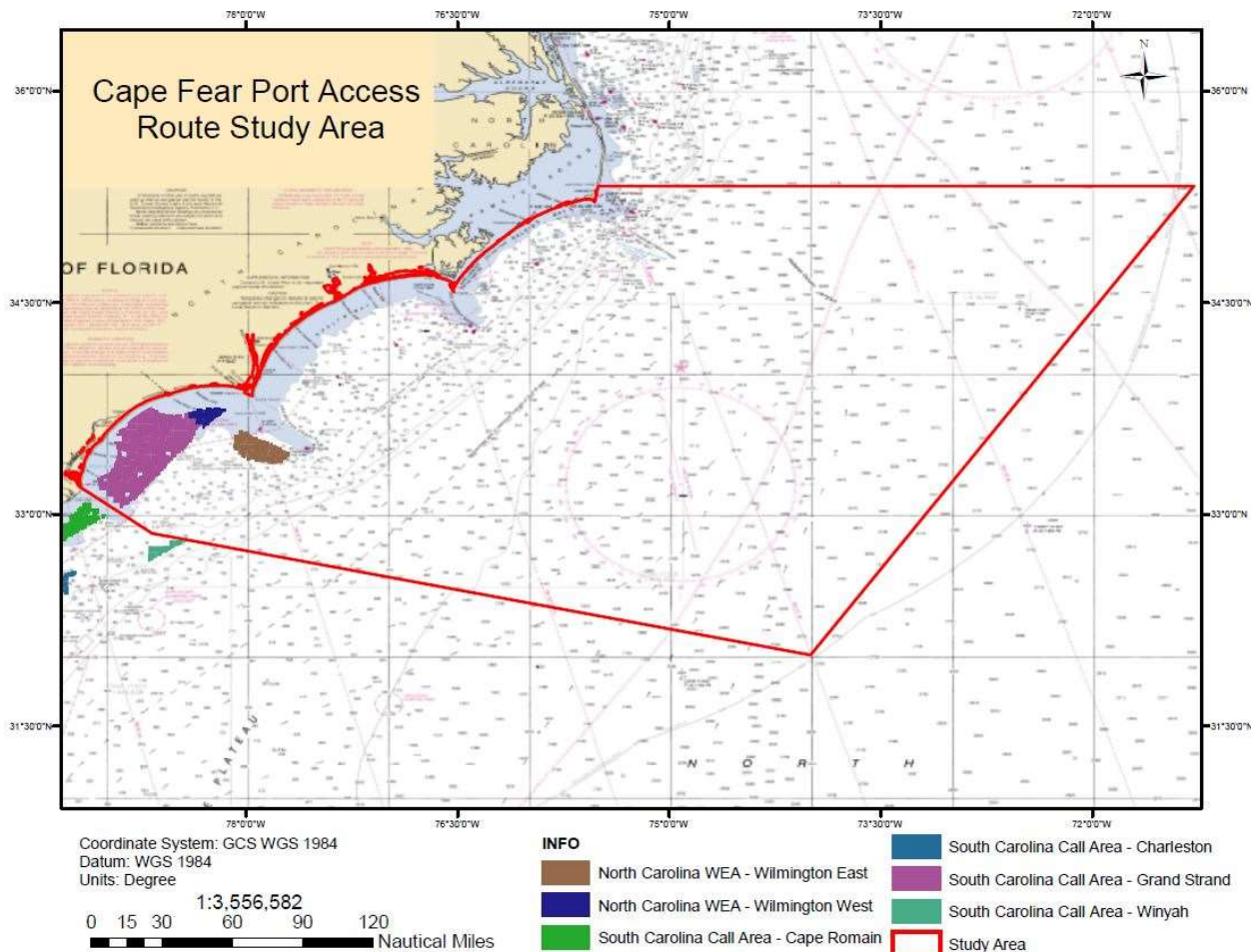


Figure D.1¹⁴

Wilmington East Wind Planning Area: BOEM intends to lease additional wind energy areas offshore of North Carolina referred to as Wilmington East. BOEM held an Intergovernmental

¹⁴ BOEM, 2021. Found at https://www.boem.gov/sites/default/files/images/jm_ncmap.png.

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Renewable Energy Task Force meeting to solicit feedback on July 21, 2021. The proposed sale notice was published on November 1, 2021. A final sale will be published no later than March 31, 2022.

Wilmington West Wind Planning Area: BOEM identified a wind energy area offshore of North Carolina referred to as Wilmington West. BOEM held an Intergovernmental Renewable Energy Task Force meeting on July 31, 2021, to solicit feedback on the area. BOEM does not intend to lease this area before a ten-year moratorium on offshore leasing goes into effect July 1, 2022.

South Carolina Long Bay Wind Planning Area: BOEM identified a wind energy area offshore of South Carolina referred to as Long Bay. BOEM held an Intergovernmental Renewable Energy Task Force meeting on July 31, 2021, to solicit feedback on the area. BOEM does not intend to lease this area before a ten-year moratorium on offshore leasing goes into effect July 1, 2022.

Routing Measures

International Maritime Organization Routing Measures: Current IMO routing measures exist in the approach to the Cape Fear River and include the following:

Precautionary Area	The area adjacent to the nearshore terminus of the TSS where a pilot boarding area is contained. Mariners are advised not to anchor or linger in the precautionary area except to pick up or disembark a pilot.
TSS	The approach to the Cape Fear River, North Carolina, includes inbound and outbound traffic lanes with a separation zone between.

Table E.1

Pilotage

Every foreign vessel and every United States vessel sailing under register, including such vessels towing or being towed when underway or docking in the waters of the Cape Fear River and Bar or the Morehead City Harbor and Beaufort Bar, either incoming or outgoing, and over 60 gross tons, shall employ and utilize a State licensed pilot. Every foreign vessel sailing, including such vessels towing or being towed when underway or docking in the Morehead City to Aurora water route, and over 60 gross tons, shall employ and utilize a State licensed pilot.¹⁵ Additionally, 46 C.F.R. § 812 requires coastwise seagoing vessels propelled by machinery and subject to inspection under 46 U.S.C. Chapter 33 and coastwise seagoing tank barges subject to inspection under 46 U.S.C. Chapter 37 to be under the direction and control of a pilot.

¹⁵ NC General Statutes - Chapter 76A. Found at [Chapter 76A.pdf \(ncleg.gov\)](#)

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Regulated Navigation Area

There is one current Regulated Navigation Area (RNA) just outside the study area. It is located at the Herbert C. Bonner Bridge across Oregon Inlet, North Carolina.¹⁶ It is not currently active; however, the Captain of the Port of North Carolina has the right to enforce it at any time. Recently it was enforced in support of demolition activities associated with a recent bridge project.

Danger Zones

Two danger zones or restricted areas are identified in the study area. A portion of the Atlantic Ocean off the New River Inlet is designated in 33 CFR 334.440 as a firing range to support U.S. Marine Corps training and operations. The second danger zone is charted off Cape Hatteras, North Carolina where mariners, anchoring, should be aware of possible residual danger from mines on the bottom.

Proposed Shipping Safety Fairways

The Coast Guard ANPRM published in 2020 proposed shipping safety fairways along the Atlantic Coast from Florida to Maine. The Coast Guard Fifth District considered the fairway system detailed in the ANPRM in all the traffic analysis and incident frequency modeling conducted for this study. Although these fairways are still in a proposed status, traffic densities within were factored into the analysis conducted by this study. Figure D.2 illustrates the proposed fairways in the study area.

Anchorage

There is an anchorage for explosives charted just to the southwest of Lockwoods Folly Inlet, North Carolina. This anchorage is part of a separate rulemaking moving the explosives anchorage and establishing an additional offshore anchorage to the west of Pilot Boarding Area. Please refer to the rulemaking public docket USCG-2020-0216 for further details.

¹⁶ 33 CFR 165.520

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E. Maritime Data, Trends and Analysis

Meteorological Data

The implementation of routing measures or fairways will not mitigate weather related impacts to navigational safety. There are diurnal tides with high and low waters occurring at about the same time along the North Carolina seacoast. The currents have considerable velocity in the inlets along the seacoast and in the narrow channels connecting the inlets and the bays and sounds. Historical data from offshore weather buoys indicate a predominant current to flow in an easterly direction¹⁷. Seasonal severe weather occurs in the late summer and mid-winter with high winds of 28 knots or more from the northwest through north from December through March. Tropical cyclones are a threat throughout the summer and fall with the peak of the season in August and September. The ports of Wilmington and Morehead City, North Carolina, closed for heavy weather six times between 2012 and 2019. Closures have lasted from one to four days, depending on the weather impact. Figures E.1 and E.2 display average wind speeds from NOAA weather station (Station CLKN7) located at Cape Lookout, North Carolina, and the NOAA weather station (Station BFTN7) located at Beaufort Inlet, North Carolina. Figures E.3 through E.6 are historical charts of tropical cyclone activity in the years 2016-2019 in the North Atlantic.

¹⁷ www.ndbc.noaa.gov

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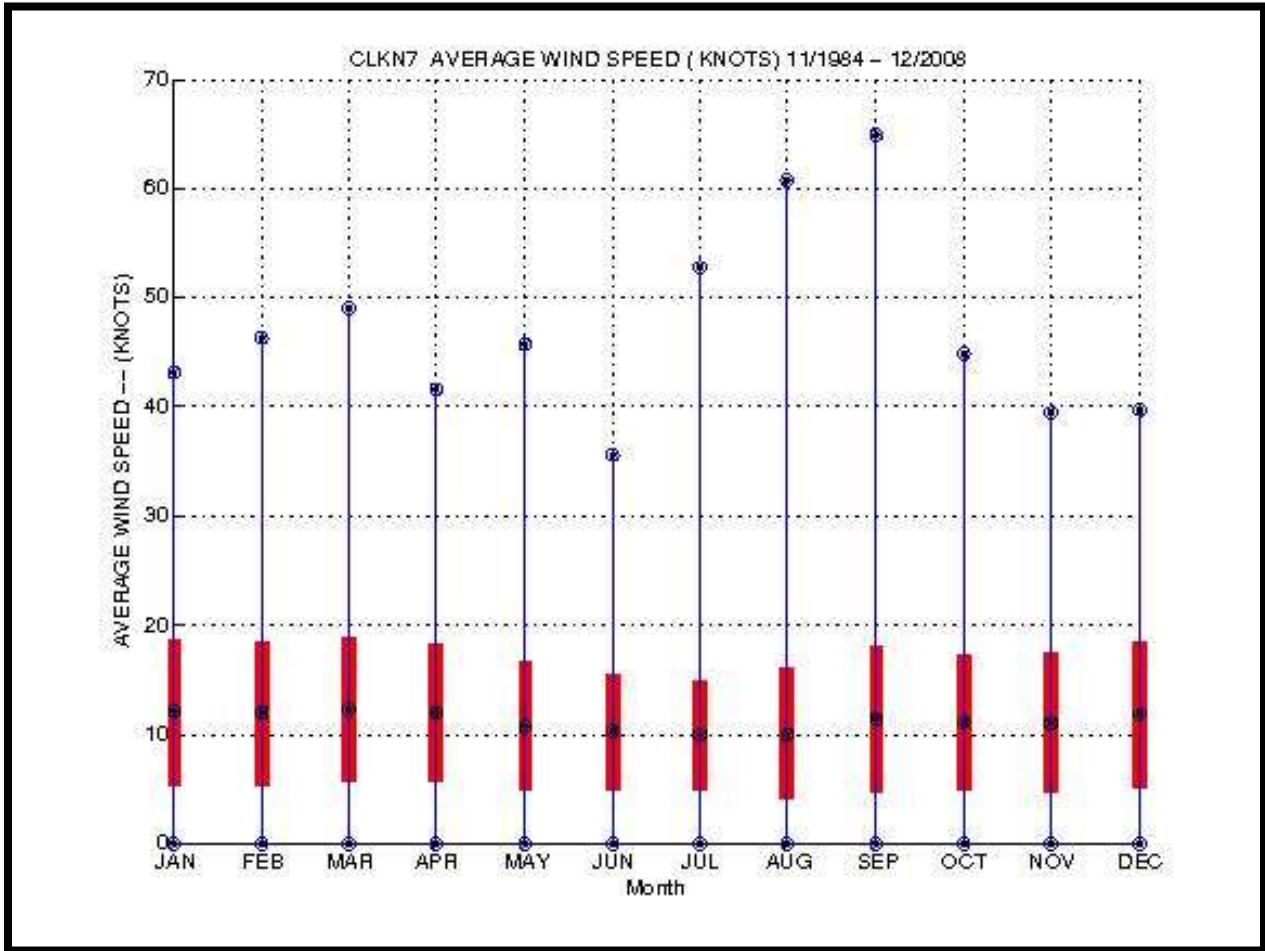


Figure E.1 – Cape Lookout wind speed data

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2021

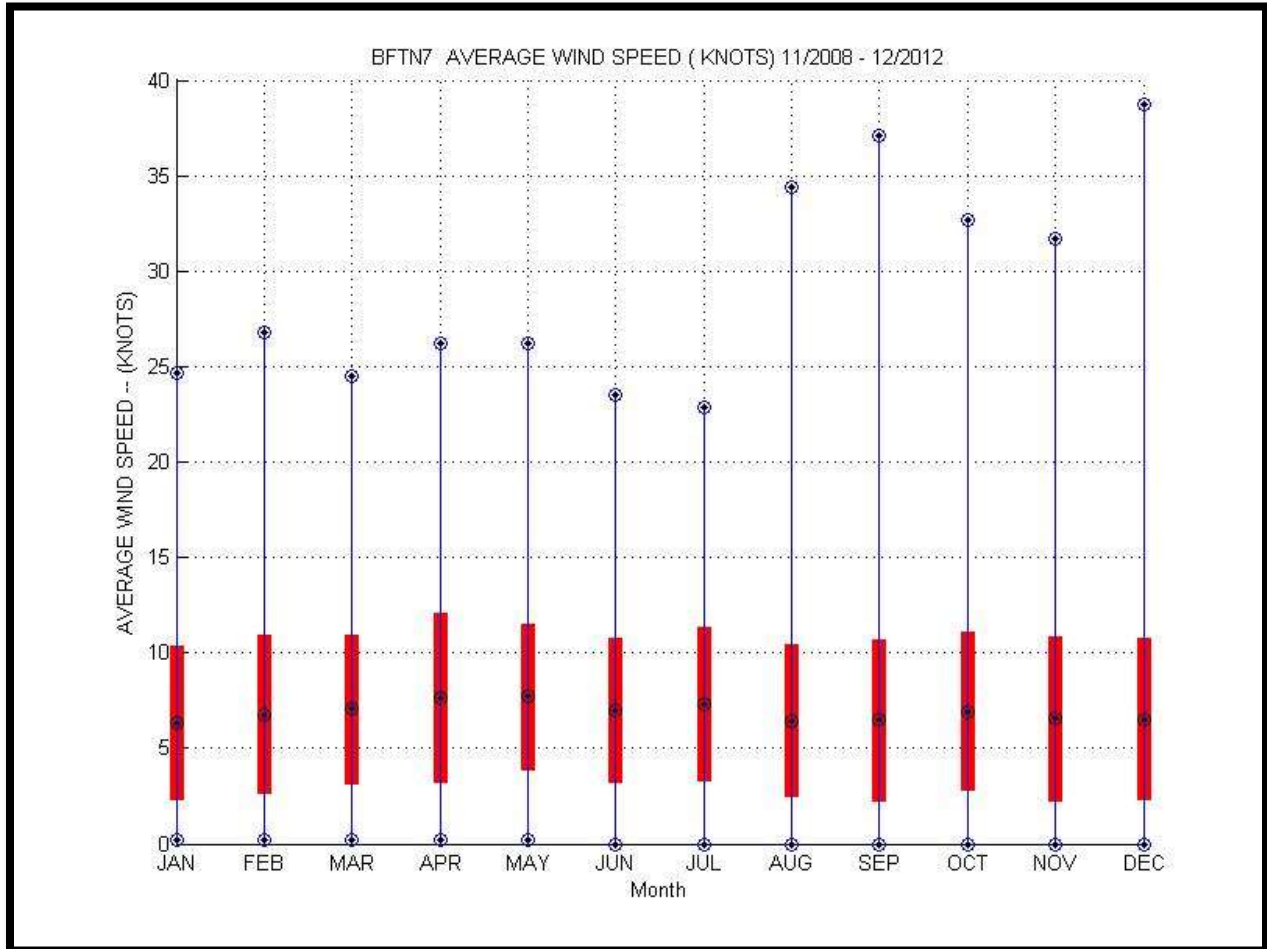


Figure E.2 – Beaufort Inlet wind speed data

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Historical charts of North Atlantic Hurricane tracking 2016-2019

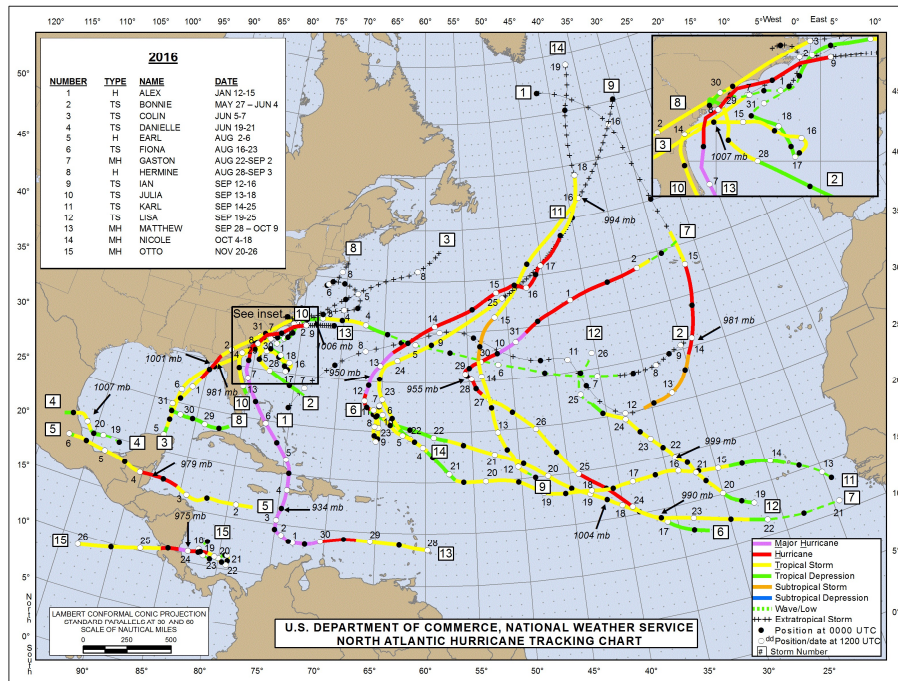


Figure E.3

USCG-2020-0093 Port Access Route Study: Seacoast of North Carolina including approaches to the Cape Fear River and Beaufort Inlet, North Carolina

2021

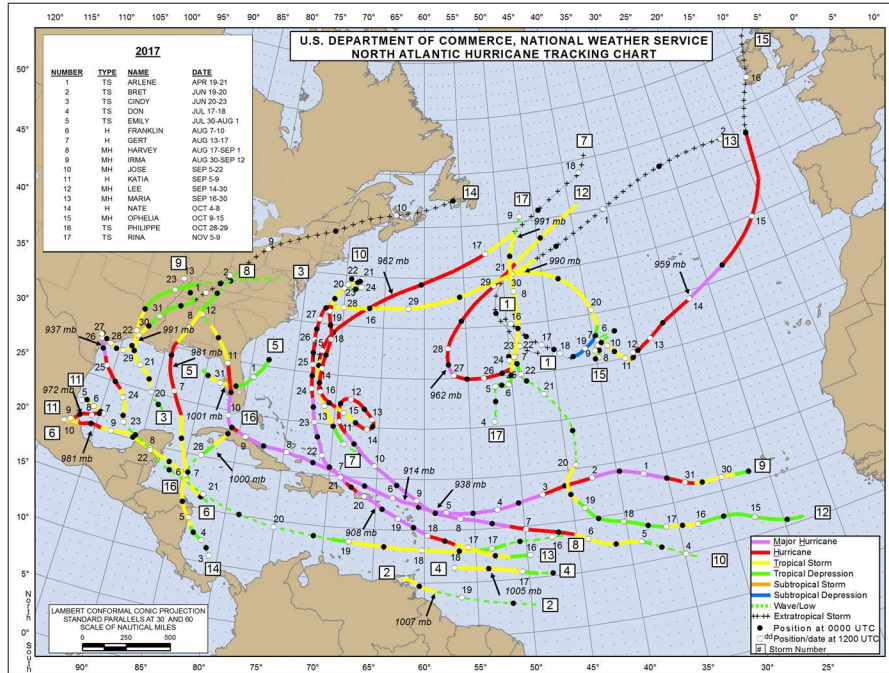


Figure E.4

USCG-2020-0093 Port Access Route Study: Seacoast of North Carolina including approaches to the Cape Fear River and Beaufort Inlet, North Carolina

2021

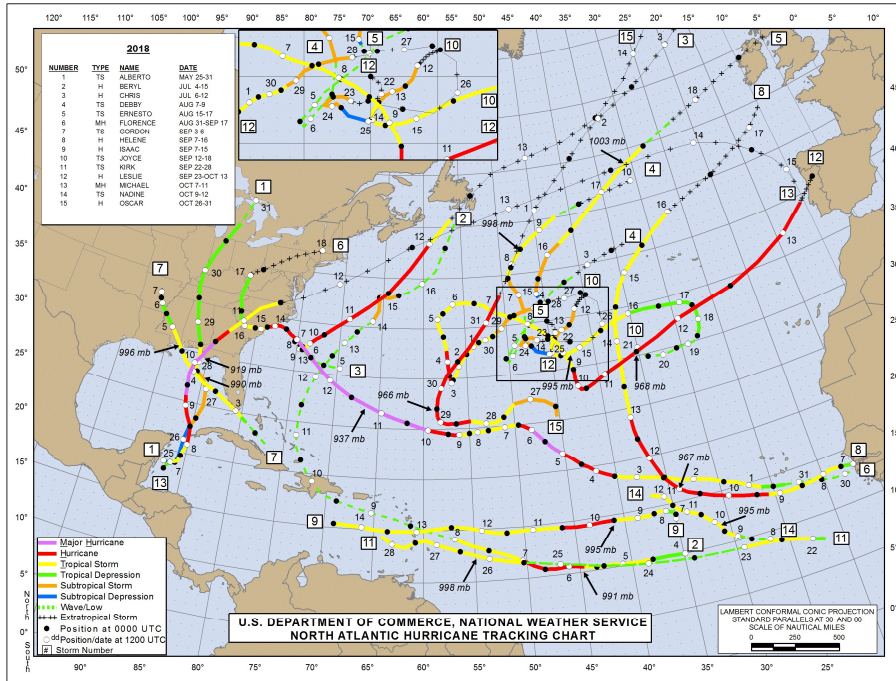


Figure E.5

USCG-2020-0093 Port Access Route Study: Seacoast of North Carolina including approaches to the Cape Fear River and Beaufort Inlet, North Carolina

2021

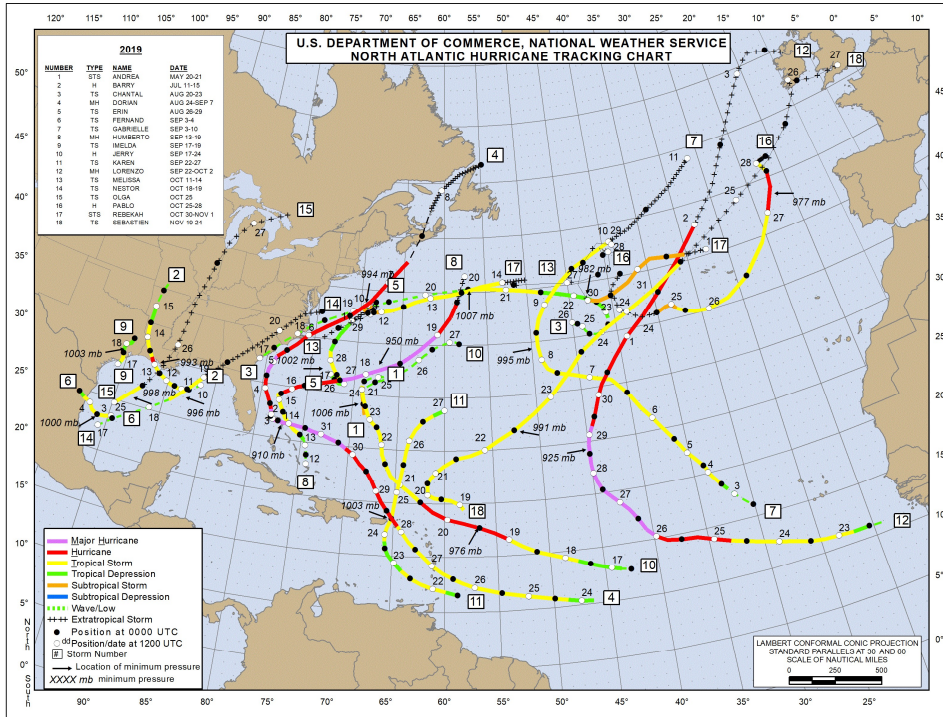


Figure E.6

USCG-2020-0093 Port Access Route Study: Seacoast of North Carolina including approaches to the Cape Fear River and Beaufort Inlet, North Carolina

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Coast Guard Activity

Coast Guard activities within the study area include search and rescue, marine inspection, marine environmental response, maritime law enforcement, high value asset escorts, high interest vessel boardings, living marine resource enforcement, aids to navigation maintenance, and marine casualty/accident investigations. With an increase in activity due to military outload security and the construction, operation, and maintenance of OREI, we anticipate a moderate increase in vessel traffic near the OREI, which could lead to increases in Coast Guard activities. The Fifth Coast Guard District does not anticipate these activities will affect study conclusions related to port access. Coast Guard missions will continue to occur despite any changes in the MTS, world shipping patterns, and future offshore development. The report acknowledges that mission policy guidance and practical operations parameters may change in the future.

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Search and Rescue Activity Data

The study area overlaps two Coast Guard regional operational commands. District Five is located in Portsmouth, Virginia, and District Seven is in Miami, Florida. Sector North Carolina in Wilmington, North Carolina, falls within the Fifth District and Sector Charleston, South Carolina, within the Seventh District. Coast Guard search and rescue cases offshore are coordinated between the District Command Centers. Local units from the appropriate Sector(s), Small Boat Stations, and Air Station are used to conduct these cases. Table E.1 breaks down case numbers per year contained within the study area. Table E.2 separates annual cases by type of accident. Figure E.7 shows a scatter plot of these case locations.

Calendar Year	Total
2010	42
2011	85
2012	86
2013	44
2014	32
2015	119
2016	105
2017	135
2018	131
2019	114
2020	23
Grand Total	916

Table E.1

USCG-2020-0093 Port Access Route Study: Seacoast of North Carolina including approaches to the Cape Fear River and Beaufort Inlet, North Carolina

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Case Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Allision						2	1		2	1	1	7
Capsized	4	9	9			5	3	14	8	9		61
Collision					1	2		1	1			5
Disoriented	2	1	1	1		1		1	3	1		11
Fire		2	2	1		1	4	1	2	4		17
Grounding	1	4	13	7	3	7	8	9	5	4	1	62
Stranded			1			3	1	2	1	1		9
Taking on Water	6	12	13	2	2	21	16	13	20	20	1	126
Disabled Vessel	5	11	10	10	6	22	18	25	22	25	4	158
Overdue Vessel	2	9	4	4		5	2	8	6	6	2	48
Vessel in Distress	5	15	8	2	10	17	19	20	20	16	10	142
Person in Water	9	12	17	13	5	19	16	21	19	13	3	147
Medical Evacuation	6	9	7	2	3	12	8	12	14	19		82
Beset by Weather						1	6	2	2	2	1	14
Vessel Adrift	1	1		2	1		3	5		1		14
Vessel Escort						1			2			3
Dive Accident			1					1	3	2		7
Abandoned Vessel	1				1				1			3
Total	42	85	86	44	32	119	105	135	131	114	23	916

Table E. 2

USCG-2020-0093 Port Access Route Study: Seacoast of North Carolina including approaches to the Cape Fear River and Beaufort Inlet, North Carolina

2021

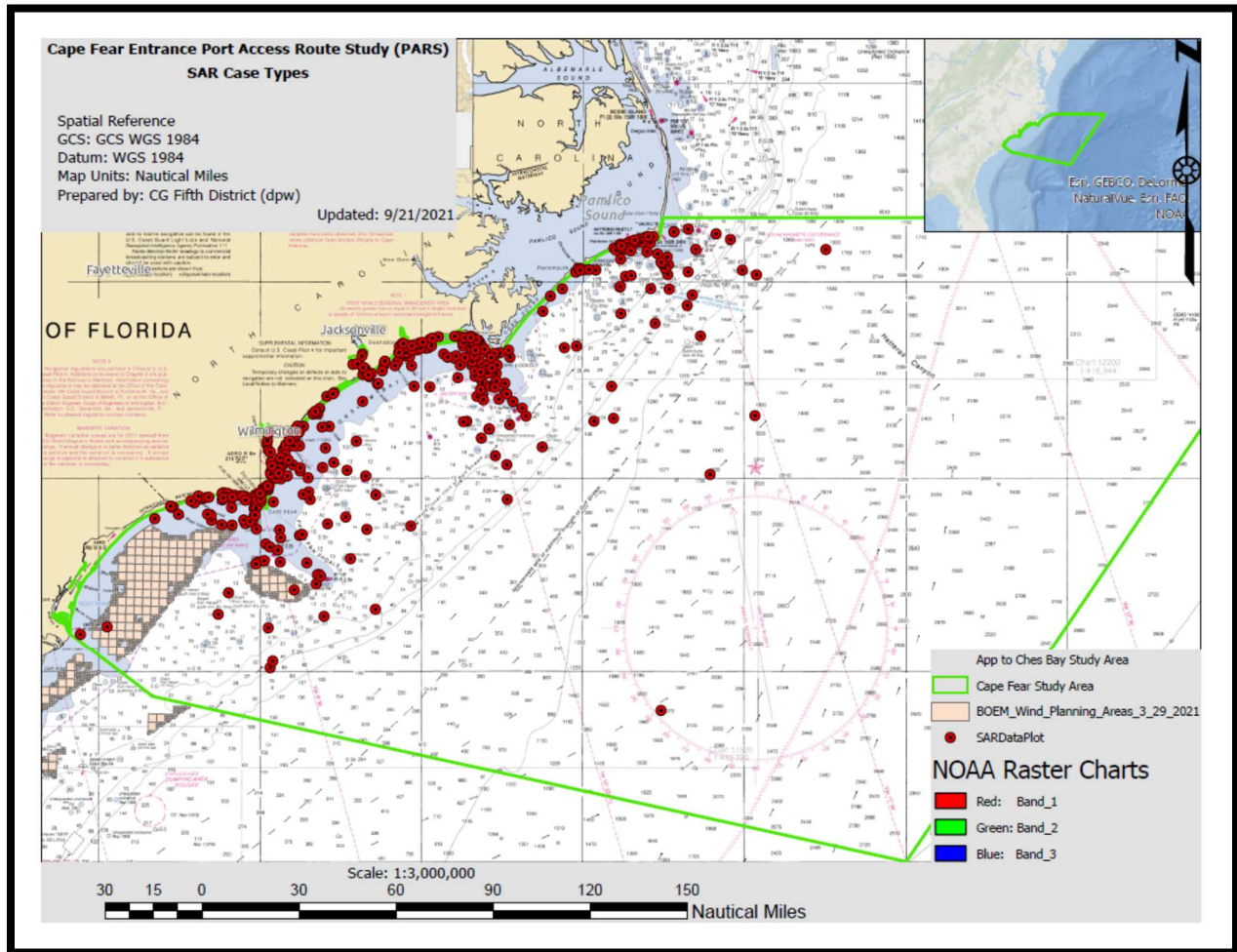


Figure E. 7 – Scatter Plot of Search and Rescue Cases

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Marine Casualty Data

Marine casualty cases are conducted when a casualty or accident defined in 46 CFR 4.03-1 occurs in federal waters. These cases are investigated by Sector personnel and their details are documented in the Coast Guard database, Marine Information for Safety and Law Enforcement (MISLE). The case files from Sectors North Carolina and Charleston, South Carolina, within the study area were analyzed. A lack of standardization in data entry hampered analysis and some data was lost due to missing location information. To refine the data and resolve the disparity, pollution cases, medical evacuation, law enforcement and personnel action case files were removed from the dataset as unrelated to the PARS. Remaining case files were plotted on a chart of the study area, categorized by initial event type (e.g. Fire, Flooding, Allision, etc). Case narratives were provided by Coast Guard Office of Investigations, CG-INV-2, to further determine if there were any casualty patterns in the data that provided guiding direction to the study focus with respect to port approach needs. Historic data shows equipment failures as the most frequent initiating event and represents the highest number of cases followed closely by groundings. Further study of the cases near the proposed WEAs found less than five cases of marine casualties; however, one case resulted in an extensive search with the loss of a recreational vessel and two lives.

Activity Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Allision		3	1	5	4	4	4		2	4	1	1	29
Breakaway			2		1		1						4
Capsize							1				1		2
Collision		1			1			1	3		3		9
Equipment Failure	1		1	1	3	2	12	12	11	17	17		77
Fire			1		1		1		2	2	1		8
Grounding	6	4	2	8	5	2	3	2	4	7	7		50
Loss of Life/Injury					1	1	2	2	3	2	2		13
Sinking									1	1			2
Total	7	8	7	14	16	9	24	17	26	33	32	1	194

Table E. 3

USCG-2020-0093 Port Access Route Study: Seacoast of North Carolina including approaches to the Cape Fear River and Beaufort Inlet, North Carolina

2021

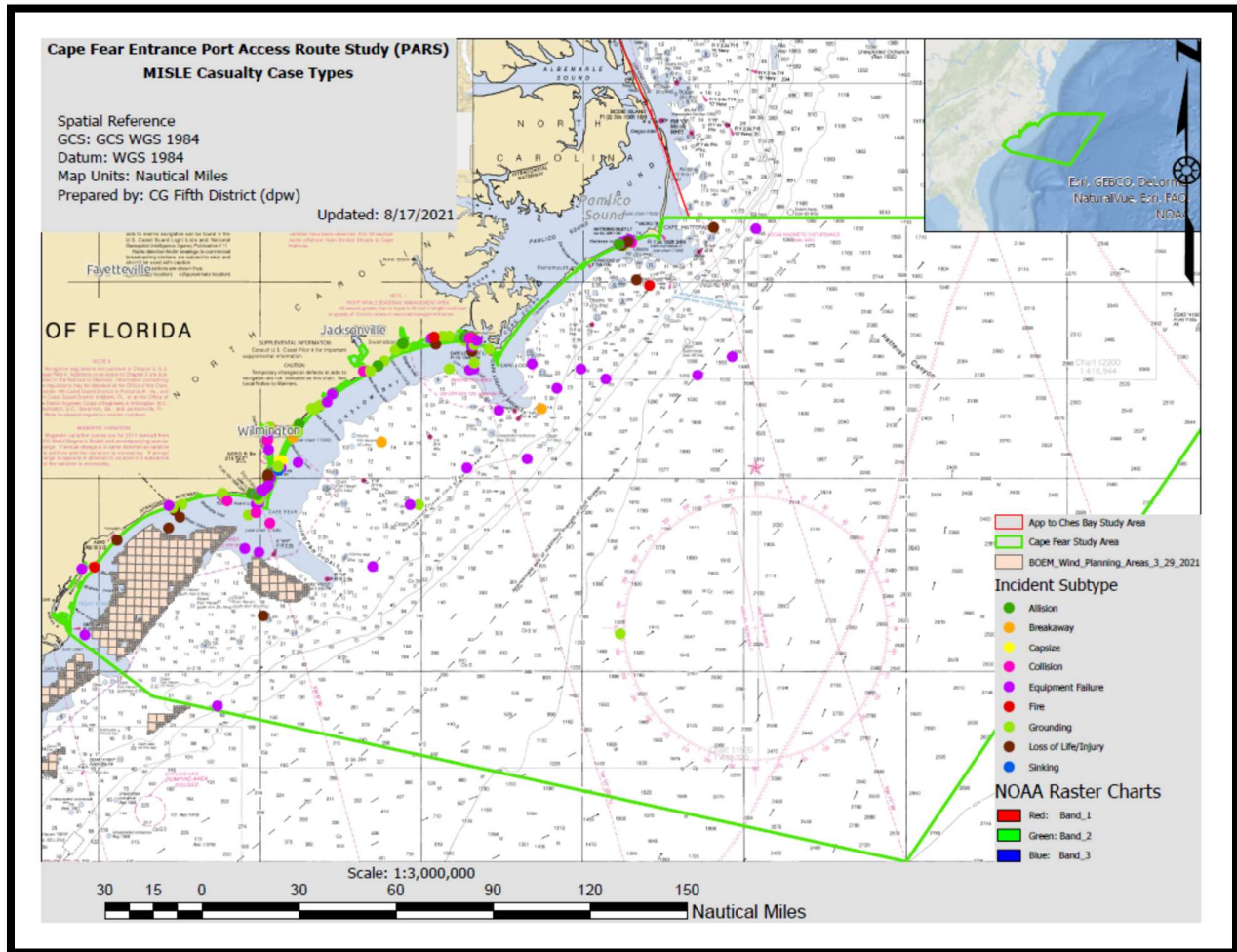


Figure E.8 – Marine Casualty Case Type Scatter Plot

USCG-2020-0093 Port Access Route Study: Seacoast of North Carolina including approaches to the Cape Fear River and Beaufort Inlet, North Carolina

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Commercial Fishing and Small Passenger Vessel Activity

Small commercial fishing, diving and passenger vessels, as well as recreational vessels are all active within the study area. Discussions with Sector Charleston and Sector North Carolina Commercial Fishing Examiners and local small boat station operators confirmed the presence of transient pleasure craft traffic traversing the Atlantic Intracoastal Waterway (AICW) heading south in the winter months and north in the spring months. The remainder of the traffic in the inlets is primarily small vessels (less than 150 feet length overall) predominantly operating mid-March through late October, conducting fishing charters and diving charters. BOEM study, OCS 2013-220, concluded that diving operations from commercial and personal vessels is a predominant use of the ocean in this region due to the high number of shallow, nearshore wrecks and shark teeth found in the study area. Two gaming vessels, homeported in Little River Inlet, South Carolina, also operate regular transits to international waters, more than three nautical miles offshore.

Although reef fishing dominates the commercial and recreational fishing in this southern region offshore of North and South Carolina, an important trawl fishery for brown and white shrimp also exists, largely in State waters inshore of the first virtually continuous rocky ledge of hard-bottom habitat. This zone, historically from about one to three NM offshore from Brunswick County, North Carolina, southward into Florida, is characterized by a depositional environment and muddier sediments in which shrimp prefer to feed. Outer Continental Shelf Study, BOEM 2013-210, concluded that this type of trawling activity occurs inshore of the most landward boundary of Wilmington-West and the Long Bay, South Carolina, Call Area.¹⁸ The Fifth Coast Guard District concludes, with Wilmington West and Long Bay not currently available for OREI leasing, and trawling activity occurring closer to shore, transits through the Wilmington-West call area by trawling vessels are likely to remain relatively low in number.

The Fifth Coast Guard District recognizes that Automatic Identification System (AIS) data is not comprehensive of all Commercial Fishing Vessels (CFVs) in the study area. Also, National Marine Fisheries Service (NMFS) Vessel Monitoring System (VMS) does not provide additional traffic pattern data due to the lack of fishery regulations in the region. The Fifth Coast Guard District collaborated with the North Carolina Department of Environmental Quality – Division of Marine Fisheries to review trip ticket records from 2017 through 2020. This data requires commercial anglers to record their sales with a legally licensed seafood dealer. Therefore, all commercial seafood landings should be captured in this dataset. While some of the data is confidential in nature to preserve the individual fishing locations, it did confirm information found in other data sources. There is evidence that the majority of vessels in the major coastal inlets (Winyah Bay, Murrells Inlet, and Little River Inlet, South Carolina, Masonboro and Hatteras Inlet, North Carolina) are smaller, pleasure, fishing, and passenger vessels (charter

¹⁸ U.S. Department of the Interior. 2013.

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fishing and diving). Figure E.10 shows the average lengths of fishing vessels in the study area from the AIS dataset.

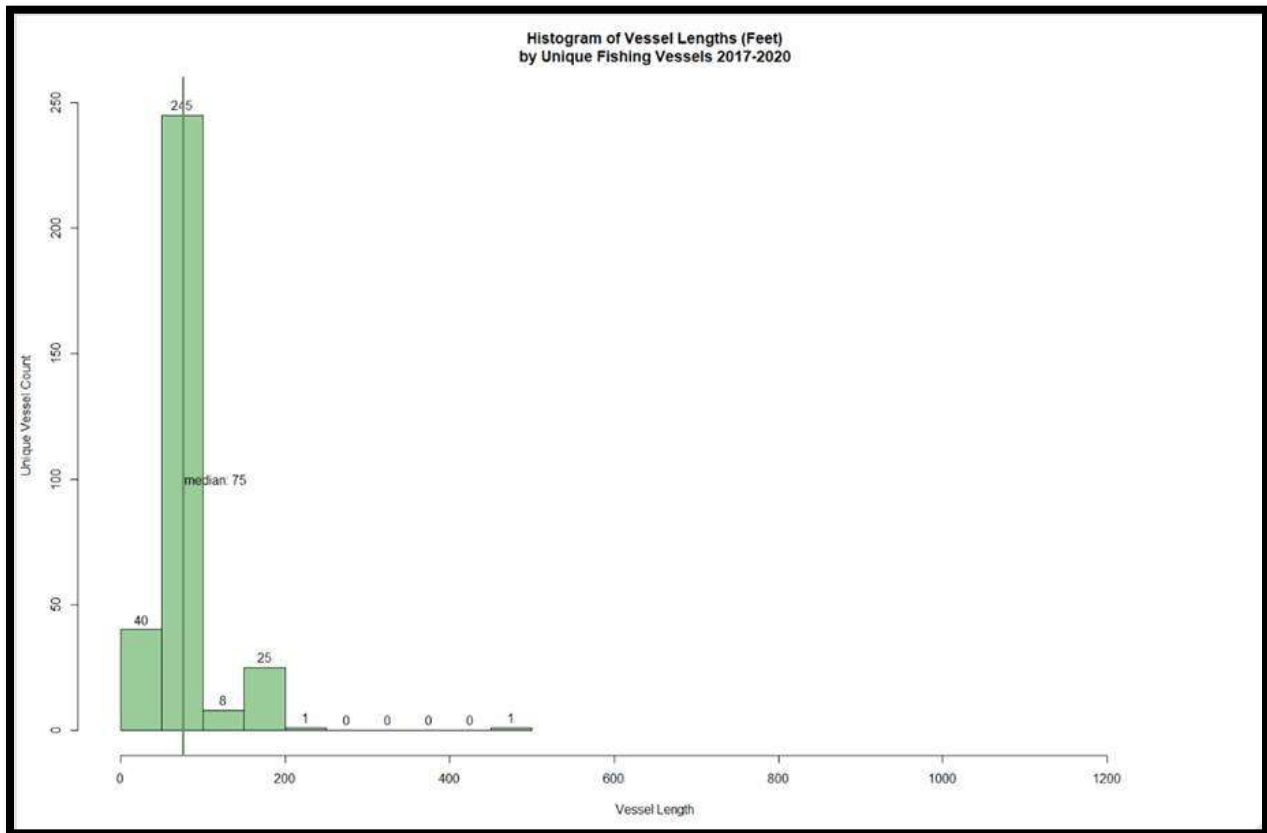


Figure E.10

Recreational Boating Activity

Outer Continental Shelf Study, BOEM 2013-210, further determined recreational vessel activity within the lease area fluctuates based on the status of the fishery. Ground fishing will likely improve with the development of the turbine field.¹⁹ This study considers that additional recreational vessel activity may lead to an increase in search and rescue events. Proposed routing measures are not generally used by recreational vessels; however, they illustrate areas where commercial traffic occurs. The Fifth Coast Guard District concludes that routing measures will improve recreational vessel operator awareness of the presence of this traffic in and around the OREIs and may mitigate some of this potential risk. The study did not attempt to

¹⁹ U.S. Department of the Interior. 2013.

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determine minimum safe distances for fishing within the OREI. These impacts are evaluated during BOEM's environmental assessment for individual projects.

The commercial and recreational fishers operating in and around the Wilmington-East and Wilmington-West Call Areas are focused largely on reef fish, to include the Snowy Grouper, realize that currently low stock sizes of several species limit allowable catches, and recognize that the substantial augmentation of rocky reef habitat associated with wind turbines represents a valuable potential benefit to their fishing. As sea surface temperatures in the southeast Atlantic Ocean continue to rise, fishermen have noticed an increase in Florida spiny lobsters, which they feel over time, and given the potential new habitat provided by offshore wind facilities, could result in a North Carolina spiny lobster fishery. The best possible area for promoting this new fishery coincides with relatively high hogfish abundances, namely in the southern portion of the Wilmington-East Call Area.

Ferry Traffic

The State of North Carolina has an extensive ferry system, both public and private, connecting the mainland to the barrier islands. These ferries operate year round on regular schedules in the coastal zone. The ferry routes are outside the study area, which is focused on offshore waters.

Global Shipping Trends

General implication of the trend towards larger ships on ports

Industries are adapting their cargo to the container shipping method - containerization. Commodities such as malt, peat moss, fertilizers, timber, scrap and waste products are now largely containerized. It is likely that in the next decade ninety percent of the general global cargo will be shipped in containers. By using a container, a door-to-door concept can be more efficient. Cargo transported directly from the mill to the consignee, or even directly to the consumer, makes it more efficient and reduces the risk of damages.

The size of the largest vessels in the world's shipping fleets have more than doubled over the past two decades. In 2005, the largest container ships were just under 10,000 TEU, a common container unit of measure. Today the vast majority of orders are for ships larger than 10,000 TEU and shipping lines are beginning to order 22,000 TEU ships.

Many of the older ships displaced by these large vessels were scrapped, but shipping lines are deploying 6,000-10,000 TEU vessels in different ways, leading to a cascading effect in which ships being replaced by larger vessels on the major trade lanes are being deployed in secondary trade routes. The trend towards larger ships affects all ports, big and small. Although the largest ships generally do not come to North America, U.S. ports are increasingly handling larger vessels. In many ports, larger ships are expected to lead to fewer port arrivals and departures.

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Alternatively, many other ports may experience a higher frequency of transits due to offshore lightering operations that improve port access where channel or cargo handling constraints preclude use of larger vessels. The majority of large commercial vessel traffic entering the Cape Fear River are either tank or cargo vessels. These vessels follow common track lines when entering and departing the port using the charted TSS. To a lesser extent with fewer vessels, the same is found in Beaufort Inlet and the approach to Morehead City.

While transit counts give a broad idea of traffic composition over the total study area, they dilute the information because the study area is very large. A passage line analysis allows for more specific study of the major routes present. This is accomplished by counting the transits across a gate placed in the areas with the highest traffic density. A transit is counted every time a vessel crosses the passage line then enumerated and reported by vessel type. Passage lines were placed in areas that appeared to have a high traffic volume or because of their special geographic interest. Entrances and exits to inlets were of particular interest because of the likelihood of many vessel transits in these areas. The approach to the Cape Fear River is passage line six and the approach to Beaufort Inlet, North Carolina, is passage line nine in Enclosure 1. Each map also illustrates the shipping safety fairways along the Atlantic Coast published in the Advanced Notice of Proposed Rulemaking. See 85 FR 37034 (Jun 19, 2020).

The Fifth Coast Guard District provides the following calculations to recommend fairways between the Atlantic Coast Shipping Safety Fairways and the main ports in the study area:

Adequate width for Safe Access to Ports

The Fifth Coast Guard District used the World Association for Waterborne Transport Infrastructure (PIANC), MarCom Working Group Report to calculate the minimum width needed for a fairway based on length of vessels and frequency of transits. Using the AIS data for commercial vessels, a vessel length of 1,100 feet was used to provide the largest margin of error for safe navigation. To provide adequate space for each vessel to safely transit, the calculation takes two times the ship's length multiplied by a factor based on the number of vessels using the route annually and includes an additional safety margin. In this dataset, the average number of deep draft transits over the past four years of data totaled 2,000 vessels. Using PIANC, a factor for two vessels side by side is used for this annual vessel count. The calculation for safe width is this:

$$1,100 \text{ (vessel length in feet)} * 2 \text{ (minimum safe distance)} * 2 \text{ (multiplier less than 4,400 vessels per year)}$$

$$1,100 * 2 * 2 = 4,400 \text{ feet or } 1,341 \text{ meters}$$

The PIANC study discusses the need to account for a ship's ability to conduct a full round turn within the traffic lane in the event it must take action to avoid a collision. Using IMO Standards

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for Ship Maneuverability (IMO resolution MSC.137 (76) and MSC/Circ. 1053), the diameter of a full round turn is approximately equal to six times the ship's length. The calculation for maneuverability is this:

$$1,100 \text{ (vessel length in feet)} * 6 = 6,600 \text{ feet or } 2,011 \text{ meters.}$$

PIANC further discusses applying a 500-meter (1,640 feet) margin to the shipping lane to account for safety zones around wind turbines as referenced in Article 60 of the United Nations Convention on the Law of the Sea (UNCLOS). Of note, UNCLOS article 60 states the safety zone, "shall not exceed a distance of 500 meters," and the PIANC study explicitly states the safety zone, "is for 'protection of the structure' and is not meant as a safe distance for safe maneuvering [sic] according to COLREGs". PIANC also adds a distance of 0.3 NM (555 m) to account for any deviation a ship may take for evasive maneuvers to avoid a collision. Thus, the final calculation for safe transit width is this:

$$1,341\text{m (safe width)} + 2,011\text{m (maneuvering space)} + 500\text{m (UNCLOS margin)} + 555 \text{ m} \\ = 4,407 \text{ m or } 2.4 \text{ NM}$$

If a safety margin of 2 NM, based on the Coast Guard Marine Planning Guidelines, is included the width of the fairway would equal 4.4 NM.

The Fifth Coast Guard District proposes that a width of 5.0 NM for any fairway in the study area is sufficient based on current traffic patterns, vessel counts, and possible changes in the future.

AIS Vessel Traffic Densities and Routes

The advent and compulsory use of AIS for maritime traffic has enhanced the ability to develop data-driven conclusions on vessel traffic densities and routes. Enclosure 1 includes a detailed analysis of the AIS data for years 2017-2020 for the study area.

The majority of large commercial vessels entering the Cape Fear River and Beaufort Inlet are cargo and tank vessels. These vessels follow common track lines entering and departing the port within the charted TSS. There are high concentrations of recreational and commercial fishing vessel traffic in and out of the coastal inlets of the North and South Carolina seacoasts. While AIS is not compulsory for many fishing vessels, the use of its data coupled with NMFS VMS data, provides a largely complete picture of this type of traffic.

While transit counts give a broad idea of traffic composition over the total study area, they dilute the information because the study area is very large. A passage line analysis allows for more specific study of the major routes present. This is accomplished by counting the transits across a

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gate placed in the areas with the highest traffic density. A transit is counted every time a vessel crosses the passage line then enumerated and reported by vessel type. Passage lines were placed in areas that appeared to have a high traffic volume or because of their special geographic interest.

Navigational Safety Incident Frequency Methodology

International Association of Lighthouse and Maritime Authorities (IALA) Waterway Risk Assessment Program (IWRAP) – IWRAP is a modeling tool developed by the IALA to assess maritime risk. Using IWRAP, based on information about traffic volume and composition, route geometry and bathymetry, the frequency of collisions, allisions, and groundings in the study area is estimated. For the study area, two separate cases were modeled (Alpha and Bravo) to illustrate and calculate the frequency of incidents based on current conditions and future offshore development potential. Full details and analysis are found in Enclosure 1.

Existing Case (Alpha) – In the Alpha case, waterway characteristics are entered and AIS data is imported to determine collision frequencies with no offshore structures in place. Established traffic legs or routes were drawn and entered into the IWRAP. Bell shaped curves on either side of the leg illustrate the probability that vessels of a certain size and type will transit within the defined distance either side of the leg. The distance from the leg is illustrated by the length of the line perpendicular to the traffic leg. Green curves illustrate inbound traffic and blue curves illustrate outbound traffic. The existing case shows no significant change to traffic patterns from the 2011 ACPARS.

Future Case (Bravo) – The Bravo case was created to assess future changes in incident frequency.

In the Bravo case, traffic was not re-routed to proposed shipping safety fairways, but existing routes were analyzed with the proposed OREI development in place. The frequency of an allision with a fixed structure increases in this case, as structures exist where none were present in the Alpha case. The collision frequency remains the same as the Alpha case because there are no assumed vessel route changes.

Impact of Offshore Renewable Energy Installations – This study concludes that deep draft traffic is expected to avoid transits through the OREIs along the Seacoast of North Carolina and in the approach to the Cape Fear River. This conclusion is supported by mariners and harbor pilots, and is consistent with the practice around OREI in European waters. The increased density results in a known increase in the possibility of a vessel-to-vessel collision. The Fifth Coast Guard District proposes a combination of fairways and routing measures in Section F to mitigate this increase.

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Shipping Safety Fairways, like those in the ANPRM, ensure adequate sea space for ships to avoid collision under normal conditions. See 85 Fed. Reg. 37034 (June 19, 2020). The Fifth Coast Guard District concludes the precautionary area in the approach to the Cape Fear River and fairways recommended in Section F preserve space and lower the risk of vessel collision. This facilitates co-existence between OREI and maritime traffic in a safe manner with little impact to vessel routes.

In the approach to Beaufort Inlet and the port of Morehead City, North Carolina, the study concludes the establishment of a shipping safety fairway to connect the proposed St. Lucie to Chesapeake Bay shipping safety fairway to the dredged entrance location for Beaufort Inlet is both needed and desired to promote safe navigation into the port. This conclusion is supported by mariners and harbor pilots. While there are currently no OREIs near the port of Morehead City, the defined shipping safety fairway will provide a safer, more orderly flow of traffic.

Figure E.10 illustrates the Fifth Coast Guard District proposed fairways and precautionary area. Detailed coordinates can be found in Section F.

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F. Recommendations and Conclusions

Recommendations:

The Fifth Coast Guard District recommends modifying the shipping safety fairways as proposed in the ANPRM, and modifying the existing TSS in the approaches to the Cape Fear River. It is the conclusion, based on data contained in this study, that this combination of measures provides a balanced approach to marine planning and preserves future safety of navigation.

International Maritime Organization Routing Measures

Precautionary Area: The Fifth Coast Guard District recommends establishing a precautionary area at the offshore terminus of the TSS in the approaches to the Cape Fear River. Precautionary areas, defined in Appendix A, highlight areas where ships and fairways converge that require particular caution in navigation. The Fifth Coast Guard District expects navigation safety may be improved with such a safety measure in offshore locations where multiple navigation tracks cross in the approaches to the Cape Fear River as future traffic potentially routes around planned OREI.

Cape Fear River TSS Precautionary Area	An arc of 5.5 NM from the following point: 33.537732 N 78.211953 W that connects to the points below 33.603667 N 78.288333 W 33.575 N 78.245 W 33.545833 N 78.161 W 33.545833 N 78.102627 W
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ACPARS Shipping Safety Fairway Proposals

Beaufort Inlet Connector Fairway: The Fifth Coast Guard District recommends a fairway to ensure adequate sea space for future commercial and military traffic into the Port of Morehead City, North Carolina.

Cape Fear River Approach Connector Fairways: The Fifth Coast Guard District recommends two fairways to ensure adequate sea space for future commercial and military traffic from the offshore fairway into the TSS for the Cape Fear River, North Carolina.

Recommendation	Detailed Description
Cape Fear River Southwestern Approach Connector Fairway	32° 55' 31"N 78° 45' 26"W 32° 30' 42"N 79° 29' 19"W 32° 34' 40"N 79° 32' 37"W 32° 59' 13"N 78° 49' 35"W 33° 34' 29"N 78° 18' 2"W 33° 28' 20"N 78° 16' 4"W
Cape Fear River Southeastern Approach Connector Fairway	33° 28' 7"N 78° 8' 24"W 33° 13' 45"N 77° 57' 18"W 33° 6' 41"N 78° 8' 60"W 33° 27' 44"N 78° 15' 14"W
Beaufort Inlet Connector Fairway	34° 10' 17"N 76° 34' 54"W 34° 34' 9"N 76° 43' 24"W 34° 35' 52"N 76° 37' 42"W 34° 17' 0"N 76° 25' 32"W

Figure E.10 illustrates the Fifth Coast Guard District recommended fairways and precautionary area.

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Conclusions:

The Fifth Coast Guard District concludes the potential increased frequency of collision or allision expected in the future as shipping traffic maneuvers around offshore developments is best mitigated by a combination of the routing measures and shipping safety fairways found above. The Fifth Coast Guard District recommends Coast Guard Headquarters incorporate these alternatives with the shipping safety fairways proposed in the ANPRM and submit the TSS extension and Precautionary Areas to IMO for adoption. Data and analysis provided in Enclosures 1 through 3 suggest a need for mitigation. The Fifth Coast Guard District deems this combination provides a balanced approach to marine planning and preserves future safety of navigation.

Adequate width for Safe Access to Ports

To determine the width of connector fairways, the Fifth Coast Guard District used the World Association for Waterborne Transport Infrastructure (PIANC), MarCom Working Group Report to calculate the minimum width needed for a transit lane based on length of vessels and frequency of transits. The calculation takes two times the ship's length, multiplied by a factor based on the number of vessels using the route annually, and includes an additional safety margin. The vessel with the greatest length to transit the area is projected to be 1,300 feet, so that is the size used in the calculation to allow the greatest margin of error for safe navigation. The average number of total ship transits over the 2017-2019 time period was determined to be 10,199. Using PIANC, a factor for three vessels side by side was used for this calculation. The calculation for safe width is this:

$$1,300 \text{ (vessel length in feet)} * 2 \text{ (minimum safe distance)} * 3 \text{ (multiplier for between 4,400 and 18,000 vessels per year)}$$

$$1,300 * 2 * 3 = 7,800 \text{ feet or } 2,377 \text{ meters}$$

The PIANC study discusses the need to account for a ship's ability to conduct a full round turn within the traffic lane in the event it must take action to avoid a collision. Using IMO Standards for Ship Maneuverability (IMO resolution MSC.137 (76) and MSC/Circ. 1053), the diameter of a full round turn is approximately equal to six times the ship's length. The calculation for maneuvering space is this:

$$1,300 \text{ (vessel length in feet)} * 6 = 7,800 \text{ feet or } 2,377 \text{ meters.}$$

PIANC further discusses applying a 500-meter (1,640 feet) margin to the shipping lane to account for safety zones around wind turbines, as referenced in Article 60 of the United Nations Convention on the Law of the Sea (UNCLOS). Of note, UNCLOS article 60 states the safety zone, "shall not exceed a distance of 500 meters," and the PIANC study explicitly states the safety zone, "is for 'protection of the structure' and is not meant as a safe distance for safe

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maneuvering according to COLREGs”. PIANC also adds a distance of 0.3 NM to account for any deviation a ship may take for evasive maneuvers to avoid a collision.

Thus, the final calculation for safe transit width is this:

$$2,377\text{m (safe width)} + 2,377\text{m (maneuvering space)} + 500\text{m (UNCLOS margin)} + 0.3\text{ NM} \\ = 5,809\text{m or } 3.1\text{ NM}$$

Adding in a safety margin of 2 NM based on the Coast Guard Marine Planning Guidelines, the Fifth Coast Guard District proposes a width of 5.1 NM for connector fairways to accommodate future commercial, deep-draft vessel traffic.

Alternative Suggestions:

The Fifth Coast Guard District assessed an alternative in considering these proposals:

Alternative 1: Extend the TSS in the approach to the Cape Fear River.

Assessment: The Fifth Coast Guard District does not recommend this alternative. The study finds a fairway alternative will provide adequate space for vessels to safely navigate around future OREI. Further, the fairway alternative will manage all reasonable future waterway users without a more formal, restrictive, routing measure.

G. Public Comments

<i>Public Comment</i>	<i>Coast Guard Response</i>
<i>AWO expressed concerns about the proximity and width of the proposed near-shore and offshore fairways. Specifically, it would result in tug and tow traffic operating in the same fairway as deep draft vessels. They requested to expand the near-shore fairway to 9NM to better accommodate tug traffic.</i>	<i>The combined width of the proposed near-shore and offshore fairways is 13NM, which the Fifth Coast Guard District believes is adequate to safely accommodate the volume of tug and tow and deep draft vessel traffic in the area.</i>
<i>RODA provided comments expressing their dissatisfaction with the Coast Guard's PARS process.</i>	<i>The Fifth Coast Guard District will communicate RODA's comments to Coast Guard Headquarters to inform any future marine planning policy changes.</i>

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H. Appendices

1. Definitions

Allision: a collision between a moving vessel and a fixed or anchored object.

Area to be Avoided: an area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all ships, or certain classes of ships.

Automated Identification System: automatic tracking system that supplements marine radar and is used as a method of collision avoidance and to distinguish and plot vessel traffic patterns.

Baseline: defined by the United Nations Convention of the Law of the Sea as the line along the low water line of a coastal state.

Fairway: a lane or corridor in which no artificial island or fixed structure, whether temporary or permanent, will be permitted as per 33 CFR 166.105(a). *Fairways are not defined as routing measures under international law.*

Hydrokinetic Energy: energy created by the constant flow of ocean currents across the world's oceans.

Navigation Safety Corridor: Coast Guard term used to describe regular vessel traffic pattern derived from density plots using AIS information.

Offshore Renewable Energy Installation: an energy development project designed offshore to harness either wind or hydrokinetic energy for onshore consumers.

Port Approaches: navigation routes followed by vessels entering or departing from a or to a primary transit route.

Precautionary area: an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended.

Recommended Route: a route of undefined width, for the convenience of vessels in transit, which is often marked by centerline buoys.

Regulated Navigation Area (RNA): a water area within a defined boundary for which regulations for vessels navigating within the area have been established under 33 CFR 165.

Routing Measure: any defined measure, as defined by international law, aimed at reducing the risk of casualties; including traffic separation schemes, two-way routes, recommended tracks,

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areas to be avoided, no anchoring areas, inshore traffic zones, roundabouts, precautionary areas and deep-water routes.

Shipping Safety Fairways: a lane or corridor in which no artificial island or fixed structure, whether temporary or permanent, will be permitted. Temporary underwater obstacles may be permitted under certain conditions described for specific areas in Title 33 CFR 166, Subpart B. Aids to navigation approved by the U.S. Coast Guard may be established in a fairway.

Territorial Sea: a sea zone prescribed by the United Nations Convention of the Law of the Sea (UNCLOS) stretching from the baseline out to 12 NM over which the coastal state has sovereignty.

Traffic Separation Scheme (TSS): a routing measure aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes; or other options that may be available to facilitate safe navigation.

Two-Way Route: a route within defined limits inside which two-way traffic is established, aimed at providing safe passage of ships through waters where navigation is difficult or dangerous.

Wind Energy Areas: designated areas within the U.S. EEZ which are reserved for leasing to energy companies for the purpose of developing offshore wind turbine fields to harness wind energy.

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2. Table of Abbreviations

ACPARS	Atlantic Coast Port Access Route Study	NWS	National Weather Service
AIS	Automatic Identification System	OCS	Outer Continental Shelf
ATBA	Area to be avoided	OREI	Offshore Renewable Energy Installation
ATON	Aid to Navigation	OSS	Offshore Sub Station
AWO	American Waterways Operators	PIANC	Permanent International Association of Navigation Congresses
BOEM	Bureau of Ocean Energy Management	RNA	Regulated Navigation Area
BSEE	Bureau of Safety and Environmental Enforcement	RODA	Responsible Offshore Development Alliance
CFR	Code of Federal Regulations	SAR	Search and Rescue
CFV	Commercial Fishing Vessel	TSS	Traffic Separation Scheme
COP	Construction and Operations Plan	UK	United Kingdom
EEZ	Exclusive Economic Zone	USACE	United States Army Corps of Engineers
IMO	International Maritime Organization	USCG	United States Coast Guard
MGN	Marine Guidance Note	VMS	Vessel Monitoring System
NMFS	National Marine Fisheries Service	WEA	Wind Energy Area
NOAA	National Oceanic and Atmospheric Administration	WSC	World Shipping Council

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J. Enclosures to USCG-2020-0093