UNITED STATES COAST GUARD

Atlantic Coast Port Access Route Study Interim Report

Docket Number USCG-2011-0351

ACPARS Workgroup

13 July 2012

Executive Summary

The Atlantic Coast Port Access Route Study Workgroup (WG) was chartered on 11 May 2011, and was given three objectives to complete within the limits of available resources: 1) Determine whether the Coast Guard should initiate actions to modify or create safety fairways, Traffic Separation Schemes (TSSs) or other routing measures; 2) Provide data, tools and/or methodology to assist in future determinations of waterways suitability for proposed projects; and 3) Develop, in the near term, AIS products and provide other support as necessary to assist Districts with all emerging coastal and offshore energy projects. The WG has conducted public and stakeholder outreach including two public comments periods advertised in the Federal Register. The WG has faced challenges in the lack of Coast Guard (CG) capability to fully analyze AIS data and in identifying funding to perform modeling and analysis. This resulted in an inability to predict changes in traffic patterns or determine the resultant change in navigational safety risk given different siting scenarios of offshore renewable energy installations. However, the WG has developed a methodology for initially classifying lease blocks as: not suitable (Red), may be suitable with more study (Yellow) or suitable (Green), based on proximity to shipping routes. This methodology has been used by the CG to provide input to the Bureau of Ocean Energy Management (BOEM) regarding the potential impact to navigation of areas being proposed for wind energy development. The WG has determined, given the lack of complete AIS data and rudimentary analysis to date, that recommending even preliminary routing measures is not appropriate at this time. The WG has concluded that modeling and analysis, as described in the Phase 3 of the following report, is critical to determine if routing measures are appropriate and to evaluate the change in navigational safety risk resulting from different siting and routing scenarios. The CG is working with BOEM to develop a project to perform the Phase 3 modeling and analysis. This project is scheduled to begin in late summer, 2012. The Coast Guard is also contracting the services of a GIS analyst to support efforts to better characterize vessel traffic and further explore creating initial proposals for routing measures independent of the Phase 3 modeling and analysis.

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A. Purpose

The United States Coast Guard Deputy Commandant for Operations and the Commander, Atlantic Area jointly chartered the Atlantic Coast Port Access Route Study (ACPARS) team on 11 May 2011 (Enclosure 1). The team was chartered to address the potential navigational safety risks associated with the development of offshore renewable energy installations (primarily wind farms) and to support future marine spatial planning efforts. The team, referred to as the ACPARS workgroup (WG), was given three objectives to complete within the limits of available resources: 1) Determine whether the Coast Guard should initiate actions to modify or create safety fairways, Traffic Separation Schemes (TSSs) or other routing measures; 2) Provide data, tools and/or methodology to assist in future determinations of waterways suitability for proposed projects; and 3) Develop, in the near term, AIS products and provide other support as necessary to assist Districts with all emerging coastal and offshore energy projects.

The WG consisted of waterways management professionals from existing staffs at the Headquarters, Area and District levels. The WG was given one year to complete the study. This timeline was not met due primarily to shortfalls in resources to conduct the required modeling and analysis. The need for modeling and analysis was identified at the beginning of the study, and further reinforced as the study progressed, as being critical to evaluating changes in navigational risk. The purpose of this interim report is to provide a status of the project over the first year and discuss what remains to be accomplished.

B. Background

The ACPARS was initiated to study the navigational uses off the Atlantic Coast in support of the Department of Interior's (DOI) "Smart from the Start" initiative and provide data to support future Coastal and Marine Spatial Planning (CMSP) efforts. The ACPARS study area includes the entire Atlantic Coast (Maine to Florida) and is not focused on the port areas from the sea buoy into the port like a typical port access route study. It is focused on those waters located seaward of the existing port approach systems within the Exclusive Economic Zone (EEZ). The intent of the Atlantic Coast PARS is to identify all current and anticipated new users of the Western Atlantic near coastal zone, and determine what impact the siting, construction and operation of proposed alternative energy facilities may have on existing near coastal users and whether routing measures should be modified or created to ensure the safety of navigation.

DOI's "Smart from the Start" wind energy initiative for the Atlantic Outer Continental Shelf was launched in November 2010 "to accelerate siting, leasing and construction of new projects."[1] This initiative includes three key elements: (1) Eliminating a redundant step from the REAU rule; (2) identifying Wind Energy Areas (WEA) to be analyzed in an environmental assessment (EA) (prepared pursuant to the National Environmental Policy Act (NEPA) (42U.S.C. 4321 *et seq.*)) for the purpose of supporting lease issuance and site assessment activities; and (3) proceeding on a parallel track to process offshore transmission proposals. BOEM describes a WEA as an OCS area that appears to be suitable for commercial wind energy leasing. WEAs are delineated following deliberation and consultation with intergovernmental renewable energy state task forces.[2]

As of the date of this interim report, WEAs have been identified or areas of interest have been considered off the coasts of Massachusetts, Rhode Island, New Jersey, Delaware, Maryland, Virginia and North Carolina. The identified WEAs were located at or near the entrances to major ports because the wind energy potential in these areas is suitable for possible commercial exploitation. In these areas the depth of water is adequate for wind farm construction and there is landside electrical energy infrastructure within acceptable distances to connect to the wind farms. The initial locations of some of the identified WEAs were at or near the seaward terminus of existing TSSs. Other WEAs were located in or very near the traditional routes used by vessels in foreign trade and on Atlantic coastwise transits. The impact to safe and efficient navigation appeared to be significant, although it had not been fully characterized. To ensure safety of navigation, the Coast Guard needs to fully characterize the impacts of rerouting traffic, funneling traffic, and placement of structures that may obstruct navigation. Some of the impacts may include increased vessel traffic density, more restricted offshore vessel routing (seaward of pilotage areas), fixed navigation obstructions, underwater cable hazards, and other economic impacts. Analyzing the various impacts requires a thorough understanding of the interrelationships of shipping and other commercial uses, recreational uses, and port operations.

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[1] DOI Press Release dated 23NOV2010, "Salazar Launches 'Smart from the Start' Initiative to Speed Offshore Wind Energy Development off the Atlantic Coast" http://www.doi.gov/news/pressreleases/Salazar-Launches-Smart-from-the-Start-Initiative-to-Speed-Offshore-Wind-Energy-Development-off-the-Atlantic-Coast.cfm

[2] Federal Register, Volume 77, No.23, February 3, 2012.

C. Statutory Authority and International Guidelines

1. Routing Measures

The Ports and Waterways Safety Act (PWSA) (33 U.S.C. 1223(c)) authorizes the Secretary of the Department in which the Coast Guard resides, to designate necessary fairways and traffic separation schemes (TSSs) to provide safe access routes for vessels proceeding to and from United States ports. The designation of fairways and TSSs recognizes the paramount right of navigation over all other uses in the designated areas.

The PWSA requires the Coast Guard to conduct a study of potential traffic density and assess the need for safe access routes for vessels, before establishing or adjusting fairways or TSSs. These studies are referred to as Port Access Route Studies (PARS). 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. A 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 Atlantic Ocean in the study area.

The International Maritime Organization (IMO) is the only recognized international body for developing guidelines, criteria and regulations on an international level concerning routing and areas to be avoided by ships. IMO states the purpose of ships' routing is "to improve the safety of navigation in converging areas and in areas where the density of traffic is great or where the freedom of movement of shipping is inhibited by restricted sea room, the existence of obstructions to navigation, limited depths or unfavorable meteorological conditions."[3] Guidelines for establishing routing measures and areas to be avoided are contained in the IMO "Ships' Routeing" publication.

2. Leasing of the Outer Continental Shelf

The Energy Policy Act of 2005 amended the Outer Continental Shelf Lands Act to authorize DOI to, in consultation with the Secretary of the Department in which the Coast Guard is operating and other relevant departments and agencies of the Federal Government, grant a lease, easement, or right of way on the Outer Continental Shelf (OCS) for alternate energy related uses of the OCS that produce or support production, transportation, or transmission of energy sources other than oil and gas (43 U.S.C. § 1337(p)(1)(C)).

[3] International Maritime Organization (IMO) Publication, "Ships' Routeing," 2010 Edition.

As the lead permitting agency, pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 *et seq*., BOEM is responsible for the development and preparation of documentation for such activities on the OCS. BOEM and the USCG have entered into a Memorandum of Agreement (MOA) to identify and clarify the roles and responsibilities of the agencies for the issuance of leases and approval of Site Assessment Plans (SAPs), General Activity Plans (GAPs) and Construction and Operations Plans (COPs) for offshore renewable energy installations (OREIs). Under the MOA, BOEM will utilize the USCG's expertise during the NEPA process and invite the USCG to be a Cooperating Agency during the preparation of NEPA documentation. The USCG will participate in the NEPA process as a subject matter expert for maritime safety, maritime security, maritime mobility (management of maritime traffic, commerce, and navigation), national defense, and protection of the marine environment. During BOEM's preparation of NEPA documentation, the USCG should participate at the earliest possible time.[4]

In addition to BOEM's authorities, both the Federal Energy Regulatory Commission and the U.S. Army Corps of Engineers (USACE) play roles in the permitting and licensing on the OCS. FERC issues licenses under Part I of the Federal Power Act (FPA), 16 U.S.C. §§ 792-823a (2006), and exemptions from licensing under Sections 405 and 408 of the Public Utility Regulatory Policies Act of 1978, 16 U.S.C. §§ 2705 and 2708 (2006), for the construction and operation of hydrokinetic projects on the OCS, and will conduct any necessary analyses, including those under NEPA, related to those actions.

The USACE will be the lead permitting agency for projects located within state waters.[5] Section 10 (33 USC 403) of the Rivers and Harbors Act covers construction, excavation, or deposition of materials in, over, or under such waters, or any work which would affect the course, location, condition, or capacity of those waters. Activities requiring Section 10 permits include structures (e.g., piers, wharfs, breakwaters, bulkheads, jetties, weirs, transmission lines) and work such as dredging or disposal of dredged material, or excavation, filling, or other modifications to the navigable waters of the United States. The geographic jurisdiction of the Rivers and Harbors Act includes all navigable waters of the United States which are defined (33 CFR Part 329) as, "those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce." This jurisdiction extends seaward to include all ocean waters within a zone three nautical miles from the coastline. However, the USACE authority extends beyond three nautical miles to prevent obstructions to navigation in navigable waters of the United States for artificial islands and fixed structures located on the outer continental shelf (43 U.S.C. 1333(e)).

[4] Memorandum of Agreement between the Bureau of Ocean Energy Management, Regulation and Enforcement – U.S. Department of Interior and the U.S. Coast Guard – U.S. Department of Homeland Security, "Offshore Renewable Energy Installations on the Outer Continental Shelf," 27 July 2011.

[5] Along the Atlantic Coast state waters extend to 3 NM.

D. Study Approach

A Coast Guard workgroup was chartered to conduct the Atlantic Coast Port Access Route Study (ACPARS). The ACPARS Workgroup (WG) is co-chaired by Deputy Commander, Atlantic Area (LANT-09) and the Director, Marine Transportation Systems (CG-5PW)[6]. The core group consists primarily of waterways management specialists from Coast Guard Headquarters, Coast Guard Atlantic Area and Coast Guard Districts One, Five and Seven, but at times also includes other personnel from supporting offices throughout the Coast Guard, the National Oceanic and Atmospheric Administration (NOAA) and the Maritime Administration (MARAD) as needed. The WG created a Project Management Plan consisting of Four Phases that include:

1. <u>Phase 1- Data Gathering</u>. In Phase 1, the WG will gather data on existing and future waterway usage. This will be accomplished by:

a. Determining traditional shipping routes using available Automatic Identification System (AIS) data and any other available data on maritime traffic patterns.;

b. Combining AIS and other available data, analyzing to determine existing shipping routes and displaying routes in a geospatial format;

c. Gathering additional data and information to identify existing and future waterways usage through public comments;

d. Conducting stakeholder outreach through industry organizations and port level committees; and,

e. Gathering maritime transportation system information from other federal agencies.

<u>2. Phase 2- Apply Suitability Criteria</u>. In Phase 2, the WG would use the shipping routes identified in Phase 1 and apply best available guidance (such as United Kingdom (UK) Maritime Guidance Note MGN-371) to identify areas within the study area that are:

a. Unsuitable for Offshore Renewable Energy Installations (OREIs) because of proximity to or location within existing routes;

b. Potentially suitable for OREIs but require further study and analysis to determine if mitigation measures can reduce the navigational safety risk to tolerable levels; or,

c. Potentially suitable for OREIs based on available data that suggest the navigational safety risk is acceptable without additional mitigation measures.

[6] CG-5PW was formerly CG-55

3. <u>Phase 3- Modeling and Analysis</u>. The WG recognized the need to conduct modeling and analysis to predict changes in traffic patterns and determine the change in navigational risk due to the complex interactions of the various factors that would impact navigational safety. The tasks to be accomplished in Phase 3 were beyond the technical capabilities and capacity of the WG and Coast Guard resources. Phase 3 would include:

a. Developing a Geospatial Information System (GIS) based model to predict traffic density and traffic patterns that, incorporates the UK methodology[7] or equivalent, to determine the resultant navigational safety risk given alternative siting scenarios and mitigating measures. The model should be able to identify the individual and cumulative effects on the Maritime Transportation System (MTS) along the Atlantic Coast;

b. Assessing the resultant navigational safety risk associated with potential wind development areas with and without changes to routing measures or other navigational safety measures (pilotage, separation distances, regulated navigation areas, etc.);

c. Conducting analyses of potential mitigating measures to determine if modifying existing or creating new routing measures, or implementing other navigational safety measures (pilotage, separation distances, regulated navigation areas, etc.) are necessary to reduce risk to within acceptable levels and to minimize overall impacts to the MTS;

d. Evaluating options for the creation of coastwise routing measures and make recommendations for the creation of a system of routing measures that ensure navigational safety remains within acceptable limits while having the ability to accommodate multiple uses today and in the future; and,

e. Publishing findings and recommendations in a final ACPARS Report.

[7] United Kingdom Department of Trade and Industry (DTI) "Guidance on the Assessment of the Impact of Offshore Winds Farms: Methodology for Assessing the Impact of Wind Farms."

4. <u>Phase 4- Implementation of Study Recommendations</u>.

a. Review the ACPARS report from Phase 3 to determine:

(1) If additional information is needed;

(2) If changes to routing measures or creation of new routing measures are recommended; or,

(3) Whether other actions are necessary such as documentation of traditional routes, changes in Coast Guard processes to determine suitability of proposed siting or updates to the Coast Guard Navigational Vessel Inspection Circular for OREIs.

b. If no additional information is needed, issue a Notice of Study Results.

c. If additional information is needed, reopen the docket through a Federal Register notice and conduct outreach and public meetings as necessary.

d. Initiate the regulatory process to create or modify any routing measures.

e. Initiate IMO processes as applicable to establish routing measures.

E. Status Summary

1. Phase 1 – Status of Data Gathering

a. Determine Traditional Shipping Routes Based on AIS-

Automatic Identification System (AIS) data is the primary source of vessel transit data available to the Coast Guard and the WG. The WG found that the Coast Guard AIS database was designed to store large amounts of historical AIS data, but was not designed to extract and analyze data. The ACPARS was the first effort by the Coast Guard to analyze AIS data on such a large scale. As a result, the Coast Guard did not have the capability to process the AIS as desired and the WG was not able to characterize vessel traffic to the extent that was needed. The Coast Guard was able to produce some AIS products that enabled the WG to compare vessel traffic to proposed wind energy areas.

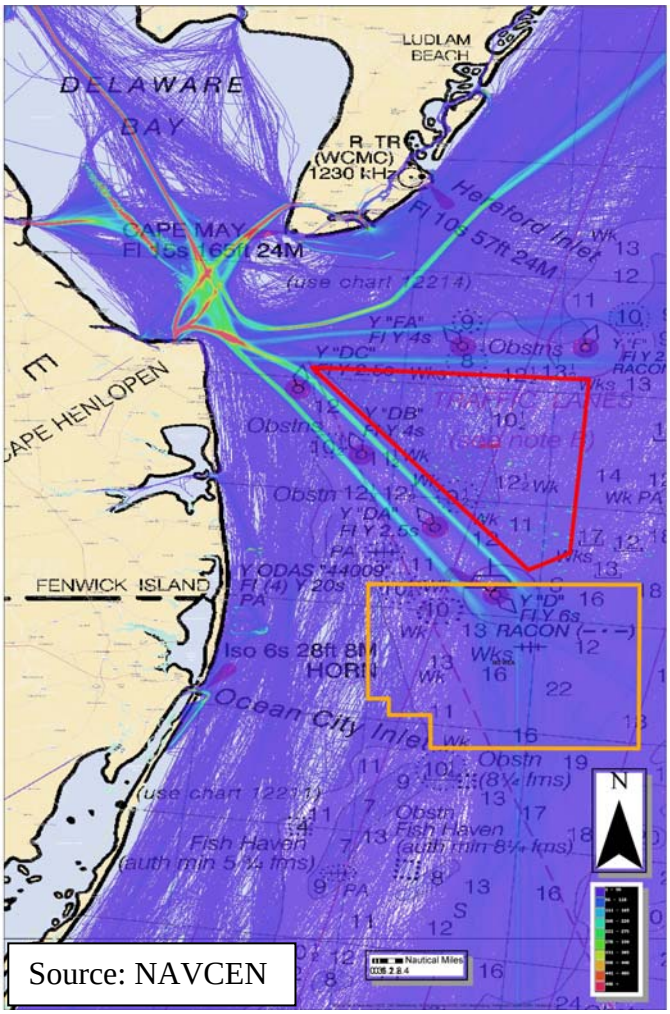

Figure 1- Heat Map of the Delaware Bay Entrance with the Initial WEAs proposed for Delaware and Maryland

"Heat map" is a term used for a depiction of line density or point density where the "hotter" color reflects a higher density.

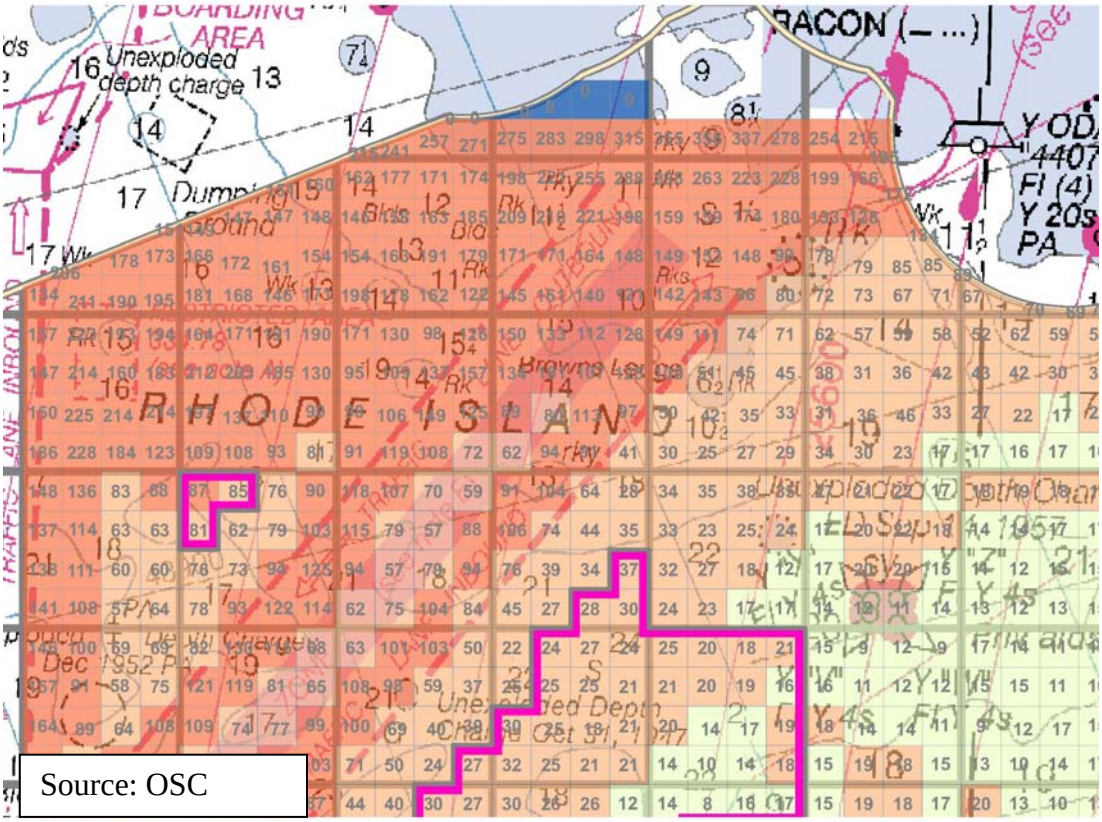

Figure 2 – Density Plot of the Entrance to Buzzard's Bay

"Density Plots," for the purposes of this report, refer to the number of vessels that transited through a defined area (such as an aliquot[8] or lease block) over a defined period of time.

Available in the AIS data is several information fields including , but not limited to, the vessel type, speed, direction, length, draft, and a time/date stamp. The heat maps and density plots produced by the Coast Guard were primarily limited to only depicting all vessels for a one year period. What the WG needed, but was unattainable to this point, is the ability to process the AIS data by each of the individual information fields. See Appendix III for a detailed summary of the efforts to acquire AIS products and the products that were produced.

[8] An aliquot is 1/16 of a lease block.

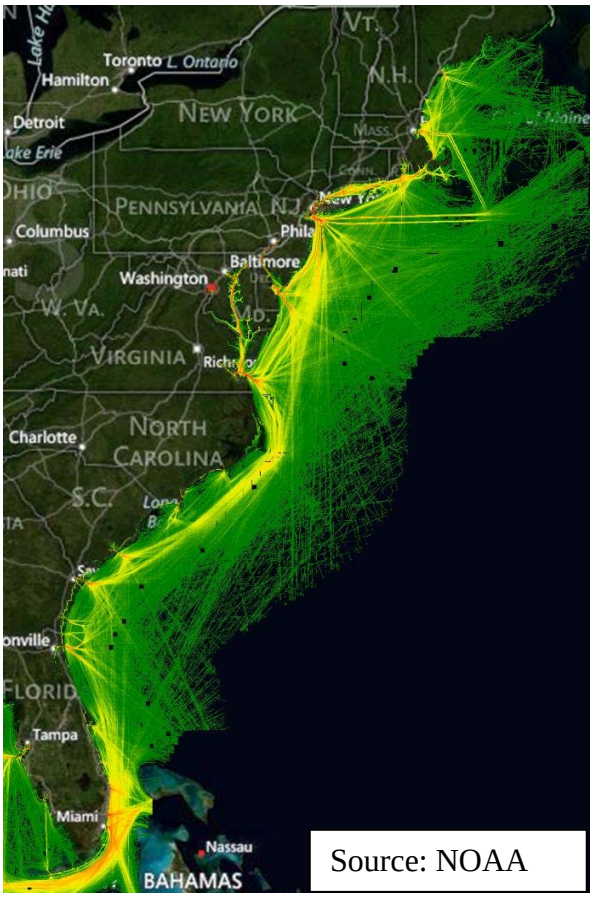

Figure 3 – Heat map of the East Coast

The Coast Guard Intelligence Coordination Center estimates that there are about 156,000 movements of major vessels along the Atlantic Coast each year, at any given time there are 4,500 vessels off the east coast.

b. Gather Information Through Public Comments

The Coast Guard published two formal requests for comments through the Federal Register (see 76 FR 27288; May 11, 2011; Docket Number USCG-2011-0351). Twenty six (26) submissions were received to the ACPARS docket during the first comment period and 103 submissions were received in the second comment period for a total of 129 submissions. Of the 129 submissions, 57 (45%) were determined to be outside the scope of the ACPARS and 3 others were duplicate submissions. A large majority of the submissions determined to be outside the scope were specific to the Cape Wind project in Nantucket Sound which has already been approved by BOEM.

The remaining submissions were reviewed and specific comments and/or recommendations were identified, resulting in a total of almost 300 individual comments. These comments were grouped into categories for organizational purposes. The categories included: Anchorage, Assistance, Buffer/Buffer Zone/Separation Distance, Cost Benefit Analysis, Environmental Impacts, Hazards, Navigational Aids, Precautionary Areas, Routes, Routing Measures, Risk Assessment, Siting, and Watchstanding (shipboard). A summary of each category of comments is included as Appendix IV. Please see the Federal Register Docket Number USCG-2011-0351 for the actual submissions.

c. Stakeholder and Public Outreach

In addition to the two formal requests for public comments, the WG has engaged and continues to engage in an extensive outreach campaign seeking participation from local, regional, national and international port and industry stakeholders. To achieve this, the WG has taken several approaches to ensure the widest audience is reached.

1) LANTAREA, Districts and Sectors leveraged existing regional partnerships and relationships between local Coast Guard units and local port partners to encourage input to the study;

2) The WG conducted targeted outreach to the towing vessel community;

3) The WG sent letters to industry organizations to ensure awareness of the ACPARS study;

4) The WG developed a website [9] to better communicate to all potential stakeholders to bolster their outreach efforts; and,

5) National level outreach was conducted by the Coast Guard Marine Transportation Systems Directorate (CG-5PW) to ensure partner agencies and national level organizations were engaged.

A more detailed description of each of these efforts is included as Appendix V.

d. Gather Marine Transportation System Data

As part of the data gathering phase the WG explored the social and economic benefits of the many uses of the waters off the Atlantic Coast including maritime trade, commercial fishing, recreational fishing, tourism and recreation. A description of the MTS and its uses is included as Appendix V.

In understanding the many varied uses of the MTS, it is important to consider future trends, particularly as they pertain to balancing multiple uses. The WG identified three major areas that may impact future uses of the Atlantic Coast waters including the expansion of the Panama Canal, the Maritime Administration's (MARAD) America's Marine Highway Program, and future exploitation of energy resources on the outer continental shelf. A description of each of these and the potential effects on the MTS are also included in Appendix V.

[9] http://www.uscg.mil/lantarea/acpars/

2. Phase 2- Status of Applying Suitability Criteria

The original intent in Phase 2 was to make an analytical determination of existing shipping routes by analyzing the AIS data to determine routes that encompassed 95% of the traffic (+ or- 2 standard deviations) traveling in the same or opposing directions.[10] The WG would then apply the R-Y-G methodology (described below) to make an initial determination of where there is high, medium or low conflict for the entire study area. Due to the limitations in the ability to process and analyze the AIS data described earlier or to identify funds for outside assistance, the WG was unable to conduct the analytical determination of vessel routes and was also unable to conduct an initial R-Y-G determination for the entire Atlantic offshore waters. As a result the WG made subjective determinations (visual) using the AIS products described in Phase 1 to apply the R-Y-G methodology to the proposed WEAs. The WG still desires an analytical determination of traditional routes be completed as a starting point for determining potential conflicts with vessel traffic. This task has been included in the statement of work for Phase 3 as an interim product.

Red–Yellow–Green (R-Y-G) Methodology

As part of Phase 2 the WG developed a methodology based primarily on the UK Maritime Guidance Note 371 to make preliminary determinations of suitability of proposed wind development areas with regard to navigation. MGN 371 provided three break points between WEAs and vessel traffic routes that were thought to be most significant and useful to this determination:

- 1 NM - The minimum distance to the parallel boundary of a TSS. At this distance there would still be S band radar interference and ARPA is affected. This is also the boundary between High/Medium navigational safety risk.

- 2 NM – The distance where compliance with COLREGS becomes less challenging, mitigation measures would still be required to reduce risk As Low As Reasonably Practicable (ALARP). This is also the boundary between Medium/Low navigational safety risk.

- 5 NM –The distance where there are minimal impacts to navigational safety and risk should be acceptable without additional mitigation. This is also the boundary between Low/Very Low navigational safety risk.

[10] United Kingdom Department of Trade and Industry (DTI) Guidance on the Assessment of the Impact of Offshore Winds Farms: Methodology for Assessing the Impact of Wind Farms, p.97. www.bis.gov.uk/files/file22888.pdf

Distance	Factors	Risk	
< 0.25 NM	Inter-turbine spacing = only small craft recommended	Very High	RED
0.5 NM	Mariner's high traffic density domain	High	
1.0 NM	Minimum distance to parallel boundary of TSS	Medium	YELLOW
1.5 NM	S band radar interference - ARPA affected	Medium	
2.0 NM	Compliance with COLREGS becomes less challenging	Medium	
> 2.0 NM	But not near a TSS	Low	
5.0 NM	Adjacent wind farm introduces cumulative effect. Distance from TSS entry/exit	Very Low	GREEN
10.0 NM	No other wind farms	Very Low	

Figure 4 - Application of UK Maritime Guidance Note 371 for Red-Yellow-Green Methodology

The workgroup selected the transition points where risk went from High to Medium (1 NM) and from Low to Very Low (5 NM). Note there is still radar interference at 1.5 NM and compliance with COLREGS is described as challenging out to 2NM. The reason for not taking a more conservative approach with larger separation distances was the desire to initially leave as much of the proposed areas as available for consideration by WEA developers early-on in the process with the understanding that it would be an iterative process and more area could be removed at a later time. For the leasing process BOEM is following, once lease blocks or aliquots were removed from consideration they would no longer be considered. A full description of how the R-Y-G Methodology was developed and the step by step procedure for designating areas as red, yellow or green is included as Enclosure 2.

To date, R-Y-G Determinations have been completed for Maryland (MD), Massachusetts (MA)/Rhode Island (RI) Area of Mutual Interest (AMI), Virginia (VA) and North Carolina (NC). The majority of the areas, that remain for consideration, have been designated as Yellow, and therefore, require additional analysis to determine if impacts to navigational safety risk can be mitigated to within acceptable limits. Description of the process and results for each of these determinations is included as Appendix VI.

3. Phase 3- Status of Modeling and Analysis

a. Develop a GIS based model to predict changes in traffic patterns and determine navigational safety risk

From the very first ACPARS White Paper drafted in January, 2011, the WG understood that for the Coast Guard to make appropriate recommendations to BOEM with regard to impacts to navigation, a modeling solution must be employed that examines how the dynamics of marine transportation would change in response to a wind installation. The WG surveyed the European markets and looked for guidance from the more mature projects regulators and developers. The science of navigational impact assessments has evolved in Europe to match pace with the advancing OREI environment. The UK methodology, "Guidance on the Assessment of the Impact of Offshore Winds Farms: Methodology for Assessing the Impact of Wind Farms" was identified as the best available guidance. (An excellent example of a more recent application of the methodology was in the preparation of the Marine Navigational Risk Assessment for the Triton Knoll Offshore Wind Farm. See Appendix IX for a description of the Triton Knoll assessment.)

Knowing that the modeling and analysis were beyond the capabilities of the Coast Guard, the WG drafted a Statement of Work (SOW) that incorporated the concepts of the assessments being conducted in Europe. The WG used the SOW to solicit three cost estimates. From that solicitation the WG received two detailed proposals and cost estimates; both estimates were in the $1.4M range. However, funding for Phase 3 modeling and analysis was not identified within existing budgets. The Coast Guard Director of Marine Transportation Systems articulated the need for modeling and analysis to the DOI Deputy Assistant Secretary for Land and Minerals and the BOEM Renewable Energy Program Manager at a meeting in March, 2011. At the meeting DOI/BOEM acknowledged the need and agreed to identify the funding to accomplish Phase 3 modeling and analysis.

BOEM expressed an interest in funding the contract directly, using one of the Department of Energy (DOE) National Labs. The WG has worked closely with BOEM staff to develop a detailed SOW and review/evaluate proposals. The WG will continue to work with BOEM and the Lab throughout the process to ensure the products produced will provide the information necessary to facilitate decisions on siting and establishment of routing measures as appropriate. The kickoff meeting is being scheduled for late summer 2012 and the modeling and analysis is expected to take approximately 18-24 months.

b. Evaluate options for creation of routing measures.

Although the intent of Phase 3 was to develop a GIS based model to predict changes in traffic patterns and determine the resultant navigational safety risk in order to evaluate options for routing measures, the WG made an attempt to identify preliminary recommendations for routing measures. NOAA hosted the WG and provided assistance with displaying AIS data for the entire study area. Given the available AIS data and comments from the public, the WG strove to identify fundamentally apparent routes along the Atlantic Seaboard and into major port areas.

A very broad summary analysis indicates, in the current unimpeded environment, vessels take roughly the same routes into major port areas. However, outside of harbor approach areas, vessels take divergent routes depending on their destination and various factors that impact safety, such as type (size) of vessel, and route characteristics such as depth of water, weather, sea state, etc., resulting in many well-traveled, distinct offshore routes.

Viewing heat maps of the entire Atlantic Coast, the WG was able to identify numerous discernable routes and other large areas of relatively high vessel concentrations where distinct routes were not apparent. The WG attempted to document the myriad routes and quickly realized it would not be possible to capture every traditional route. The WG found that if routes were to be combined to reduce the total number to a manageable level, it would increase vessel density and also result in the mixing of previously segregated vessel types (combining of slow moving and fast moving vessels).

The WG does not have the capability to evaluate and quantify the impacts to navigational safety without the modeling and analysis described in Phase 3. A conservative approach to designating routing measures would quickly remove most of the wind energy areas already being proposed, which is not in the interest of facilitating other uses.

The WG came to the conclusion that it would be inappropriate to propose even preliminary routes based on incomplete AIS data and the rudimentary evaluation that has been completed to date. The modeling and analysis portions of Phase 3 are necessary to determine if routing measures would be appropriate.

4. Phase 4- Status of Implementing Study Results

Phase 4- Implementation of Study Results cannot be initiated until the completion of Phase 3.

F. Summary and Conclusions

The WG was given three objectives in the initial charter. The first objective, to determine whether the Coast Guard should initiate actions to create or modify routing measures, cannot be met without further analysis. The WG determined that modeling and analysis beyond the capability of the WG is required to make these determinations- further detail is provided in section H. The second objective, to provide data, tools and/or methodology to assist in future determinations, has been partially met with the R-Y-G Methodology, but can be further advanced with the envisioned modeling and analysis tools. The third objective, to develop AIS products and support Districts with emerging coastal and offshore energy projects, has been met to the best of the ability of the WG given the limited resources and capabilities. Additional summaries and conclusions on specific topic areas are provided below.

1. Impact to Shipping

Although Phase 2 and 3 work has not been completed, it is clear that the placement of structures on the Atlantic Coast Outer Continental Shelf, where previously no structures existed, increases risk of a vessel allision (with a fixed object); and may increase risk of collision between vessels and/or increase risk of a grounding. The risks will increase as a result of the density of vessel traffic being increased through funneling and decreased sea space for maneuverability. The density plots that have been created provide estimations of the total number of vessels that transited through a particular aliquot over a one year period. What the WG is unable to determine with the analysis to date, is how often vessels pass within close range of each other, referred to as an encounter. The number of encounters would be a more accurate estimation of risk of a collision than vessels per aliquot per year. Rerouting (displacing) traffic may also increase the weather related casualty risk to smaller vessels engaged in coast wise shipping by forcing them further offshore, where they will be subjected to larger sea states, and where their transits will be commingled with deep draft vessels moving much faster.

2. Establishment of Wind Energy Areas

The R-Y-G Methodology provides a defensible process for the Coast Guard to evaluate proposed WEAs. The methodology leaves areas with moderate conflicts available for further study and potential leasing for site assessment and site characterization activities. This is consistent with BOEM's desire to leave as much area available for further study, because once removed, areas will not be added back in during this round. A full navigational safety risk assessment will be submitted later in the process as part of a wind developer's Construction and Operations Plan (COP), which will further inform decisions as to the suitability of an area for development. Identifying areas of moderate conflict, but allowing further analysis, is consistent with comments from the Offshore Wind Development Coalition (OffshoreWindDC) and the American Wind Energy Association (AWEA).

3. Risks of Postponing Assessment of Navigational Impacts

One of the tenets of the "Smart from the Start" initiative was to streamline the leasing process by limiting the initial environmental analyses to evaluating the impacts due to site assessment and site characterization activities. This allowed BOEM to conduct an Environmental Assessment (EA) versus a much more in depth Environmental Impact Statement (EIS); however, it also meant that impacts related to the construction and operation of a wind farm would not be fully assessed until much later in the process. Given the management decision to take a less conservative approach and leave as much area available for further study until later in the process, the WG is concerned that this gives both the public and developers a false sense that the WEA has in fact been approved and the siting of a WEA is fully acceptable for wind development. Under the current BOEM plan, the impacts to vessel traffic would not be fully evaluated until the preparation of an Environment Impact Statement (EIS) during the approval process of the Construction and Operations Plan (COP). The Coast Guard has recommended that the potential impacts to navigation from the construction of wind farms be addressed as soon as possible for any area contemplated for development. [11,12,13,14] The complexities of determining the impacts of the interaction of vessels and wind farms, the effects of increased vessel density and the impacts of decreased sea room require an analysis beyond what has been done to date. Only the site assessment and site characterization activities are currently being evaluated prior to issuing a lease and not the impacts of the actual construction and operation of the wind farm. The wind development interests have also expressed concern about WEAs being further decreased later in the process, after significant resources have been expended. This further reinforces the need to conduct analyses of navigational impacts early in the process and is in keeping with the Smart from the Start initiative to identify areas of lowest conflict for priority development.

4. Other Offshore Energy Installations

Although the current emphasis off the Atlantic Coast is for offshore wind energy, it is also necessary to consider other exploration and exploitation activities that may occur in the study area in the future, such as hydrokinetics or traditional oil, gas and mineral extraction. The Administration's[15] and the Nation's desire for energy independence, all point to further exploration and exploitation of the vast energy potential available from the Atlantic Outer Continental Shelf. This was further reinforced in a letter to President Barack Obama dated March 13, 2012 from the Outer Continental Shelf (OCS) Governors Coalition urging the Administration to speed up permitting and open new offshore areas for traditional and renewable energy projects.

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[11] U. S. Coast Guard, Commandant CG-55 letter 16650 dated 06FEB12.
[12] Comments from U. S. Coast Guard Fifth District BOEM-2011-0093-0005
[13] Comments from U. S. Coast Guard Fifth District BOEM-2011-0058-0005
[14] Comments from U. S. Coast Guard First District BOEM-2011-0097-0004
[15] http://www.whitehouse.gov/sites/default/files/email-files/fact_sheet_obama_administration_92s_all_of_the_above_a_windows_approach_to_american_energy.pdf

5. Tug and Barge Routes

Many factors affect the routes vessels take, but generally they take the most direct and safe route. Smaller and slower moving vessels tend to transit closer to shore, whereas larger and faster moving vessels tend to transit in deeper water further offshore. Based on initial evaluations, the highest conflict between tug and barge routes and proposed WEAs occur along the coastwise routes. Their routes vary based on weather, sea state and depth of water necessary for the catenary to clear the bottom when towing astern. In many cases proposed WEAs, such as at the entrance to Delaware Bay, if fully developed, could force tug and barges to transit further inshore or offshore from their traditional routes. The offshore route would take them approximately 35 miles offshore and into routes used by larger deep draft vessels. This is much farther than they would normally transit, especially the smaller units. The alternative would force them inshore across the entrance to the bay at the convergence of the TSSs and pilot boarding areas, increasing traffic density and complicating crossing situations.

6. Deep Draft Routes.

Deep draft vessels travelling on coastwise routes appear to have less of a conflict with proposed WEAs. However, the coastwise routes are located in prime areas suitable for the next round of wind development in deeper water. It appears the biggest conflicts with deep draft vessels will occur at the entrances to major port areas where wind farms are proposed at or near harbor approaches. In the case of the proposed WEA for Virginia, a significant number of deep draft vessels currently transit through the proposed area and alternative routes would need to be evaluated for a wind farm project to be considered.

7. Cumulative Impacts of Wind Farms.

One of the primary objectives of conducting a PARS for the entire Atlantic Coast was assessing the cumulative impacts of multiple winds farms on the marine transportation system. Figure 5 below illustrates the entrance to Delaware Bay and the three WEAs proposed for the area, represented by black grid-blocks. Each of the WEAs would displace vessel traffic, funneling vessel traffic into smaller areas, increasing vessel density with concurrent increased risk of collision, loss of property, loss of life and environmental damage.

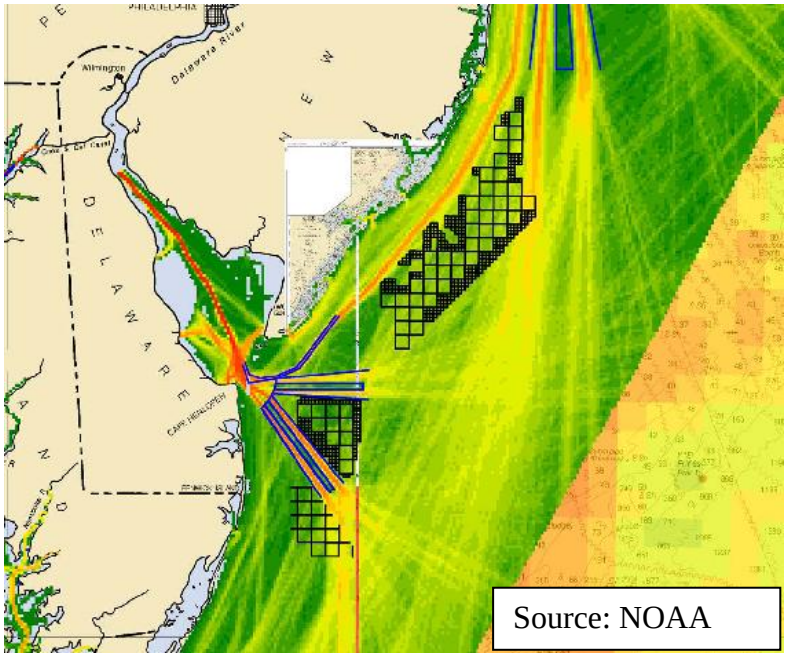

Figure 5 - Heat map of Delaware Bay entrance displaying NJ, DE and MD WEAs

Evaluating the cumulative impacts are also important to understand the cascading effects of how one wind farm may change the routes and approaches to the next port or the next wind development area. Determining how vessels would alter routes given new obstructions and quantifying the resultant change in navigational risk remains beyond the capability of the WG.

8. Establishment of Routing Measures

The customary system of historic routes used by vessels transiting the Atlantic Seaboard is very complex. Minor localized changes can be evaluated using local knowledge, stakeholder input and basic risk assessment tools employed during a PARS. However, the scope of the Atlantic Coast PARS far exceeds that of a typical PARS. Evaluating the positive and negative impacts to navigation from significant changes, such as creating a routing system for the entire Atlantic Coast, is well beyond the capabilities of the WG. The predictability provided by routing measures needs to be balanced against increased risk due to increasing vessel density and mixing previously segregated traffic. It is the opinion of the WG, and one supported in public comments from both the offshore wind industry and the maritime shipping industry, that routing measures should not be created without a full evaluation of the impacts.

Prior to initiating a rule making for routing measures, the Coast Guard would also need to consider the environmental and economic impacts, in addition to navigational safety impacts, that would result from the establishment of routing measures, particularly routing measures that increase vessel density or time and distance. Environmental impacts could include deleterious effects on air quality due to increased emissions or increased risk of marine casualties resulting in release of oil and/or chemicals into the environment. Increased time and distance would result in increased expense to ship goods. Effects on migratory species would also need to be evaluated.

G. Recommendations

1. The USCG should continue to partner with BOEM to accomplish the modeling and analysis necessary to evaluate the impacts the proposed wind energy areas will have on other users of the near coastal area, impacts to navigation safety, and the effectiveness of mitigating measures to maximize the areas available for offshore renewable energy installations. The sooner this is accomplished, the sooner developers and investors will have more certainty in projecting feasibility of projects.

2. The ACPARS Workgroup should remain as chartered to support the study as necessary to ensure coastal user concerns and navigational equities are addressed and work with BOEM to engage the maritime community in efforts to identify data gaps, information needs and further stakeholder outreach.

3. The USCG should continue outreach efforts with affected states and federal agencies, the marine shipping industry, the wind energy industry and the general public.

4. With GIS analyst support, the ACPARS Workgroup should compare AIS data to the routing measures recommended in public comments to determine if they are representative of traditional routes.

5. With GIS analyst support, the ACPARS Workgroup should further explore the possibility of developing recommended routing measures that reflect existing routes.

6. The USCG should continue its participation in BOEM Renewable Energy State Task Forces and evaluate areas proposed for development using the best available information and applying the Red–Yellow–Green Methodology to provide sound recommendations.

7. ACPARS Workgroup should draft the Final ACPARS Report and publish the Notice of Study Results upon completion of Phase 3.

Appendix I

Definition of Terms

The following definitions (except as noted by an asterisk) are from the International Maritime Organization's (IMO's) publication "Ships' Routeing," Tenth Edition, 2010:

Area to be avoided (ATBA) means a routing measure comprising 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 vessels, or certain classes of vessels.

Deep-water route means a route within defined limits, which has been accurately surveyed for clearance of sea bottom and submerged obstacles as indicated on nautical charts.

Exclusive Economic Zone (EEZ)* means the zone established by Presidential Proclamation 5030, dated March 10, 1983.

Fairway or shipping safety fairway* (33 CFR 166) means 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.

Inshore traffic zone means a routing measure comprising a designated area between the landward boundary of a traffic separation scheme and the adjacent coast, to be used in accordance with the provisions of Rule 10(d), as amended, of the International Regulations for Preventing Collisions at Sea, 1972 (COLREGS).

Obstruction* (33 CFR 64.06) means anything that restricts, endangers, or interferes with navigation.

Precautionary area means a routing measure comprising an area within defined limits where vessels must navigate with particular caution and within which the direction of traffic flow may be recommended.

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

Recommended track is a route which has been specially examined to ensure so far as possible that it is free of dangers and along which vessels are advised to navigate.

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

Appendix I

Definition of Terms

Roundabout means a routing measure comprising a separation point or circular separation zone and a circular traffic lane within defined limits. Traffic within the roundabout is separated by moving in a counterclockwise direction around the separation point or zone.

Separation Zone or separation line means a zone or line separating the traffic lanes in which vessels are proceeding in opposite or nearly opposite directions; or separating a traffic lane from the adjacent sea area; or separating traffic lanes designated for particular classes of vessels proceeding in the same direction.

Structures* (33 CFR 64.06) means any fixed or floating obstruction, intentionally placed in the water, which may interfere with or restrict marine navigation.

Traffic lane means an area within defined limits in which one-way traffic is established. Natural obstacles, including those forming separation zones may constitute a boundary.

Traffic Separation Scheme (TSS) means a routing measure aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes.

Two-way route means 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.

Vessel routing system means any system of one or more routes or routing measure aimed at reducing the risk of casualties; it includes traffic separation schemes, two-way routes, recommended tracks, areas to be avoided, no anchoring areas, inshore traffic zones, roundabouts, precautionary areas, and deep-water routes.

Appendix II

Acronyms

ACPARS – Atlantic Coast Port Access Route Study
ATBA – Area to be Avoided
AIS – Automatic Identification System
ALARP – As Low As Reasonably Practicable
ARPA – Automatic Radar Plotting Aid
AWEA – American Wind Energy Association
BOEM – Bureau of Ocean Energy Management
CFI – Call for Information and Nominations
CFR – Code of Federal Regulations
CMSP – Coastal and Marine Spatial Planning
COLREGS - International Regulations for Preventing Collisions at Sea 1972
COP – Construction and Operations Plan
DOE – Department of Energy
DOI – Department of the Interior
EEZ – Exclusive Economic Zone
EIS – Environmental Impact Statement
FAQ – Frequently Asked Questions
FR – Federal Register
GAP – General Activity Plan
GIS – Geographic Information System
IMO – International Maritime Organization
LANTAREA – Atlantic Area
MARAD – Maritime Administration
MOA – Memorandum of Agreement
MTS – Marine Transportation System
NAVCEN – Coast Guard Navigation Center
NEPA – National Environmental Policy Act
NM – Nautical Mile
NOAA – National Oceanic and Atmospheric Administration
OCS – Outer Continental Shelf
OREI – Offshore Renewable Energy Installation
OSC – Coast Guard Operations Systems Center
PARS – Port Access Route Study
PWSA – Ports and Waterways Safety Act
RFI – Request for Interest
R&DC – Coast Guard Research and Development Center
RNA – Regulated Navigation Area
SAP – Site Assessment Plan
SOW – Statement of Work
TEU - Twenty-foot Equivalent Unit
TSS – Traffic Separation Scheme
UK DTI – United Kingdom Department of Trade and Industry
UK MGN – United Kingdom Maritime Guidance Note
USC – United States Code

Appendix II

Acronyms

USCG – United States Coast Guard
WEA – Wind Energy Area
WG – Work Group

Appendix III

Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

Automatic Identification System (AIS) data is the primary source of vessel transit data available to the Coast Guard and the WG. The Coast Guard's Nationwide Automatic Identification System (NAIS) is a network of VHF receivers and transmitters designed to increase Maritime Domain Awareness (MDA) in U.S. coastal and territorial waters by tracking and communicating with AIS-equipped vessels.

The Maritime Transportation Security Act of 2002 allows the Coast Guard to collect safety and security data from AIS-equipped vessels, and share that data with Coast Guard operators and other government partners. NAIS receives 64 million AIS messages per day from approximately 6,000 unique vessels in 58 ports and 11 coastal areas. Vessels required to carry AIS include, but are not limited to: vessels over 300 gross tons; self-propelled vessels greater than 65 feet engaged in commercial service and on an international voyage other than passenger vessels and fishing vessels; and, passenger vessels of 150 gross tons or more on an international voyage.[16]

The WG found that the Coast Guard AIS database was designed to store large amounts of historical AIS data, but was not designed to extract and analyze data. The ACPARS was the first effort by the Coast Guard to analyze AIS data on such a large scale. The Coast Guard demonstrated the ability to manually extract and provide AIS data and products on a small scale, but the Coast Guard does not have the capability or system in place to routinely extract and analyze historical AIS data on a large scale.

Prior to initiation of the ACPARS, BOEM had already been processing 2009 AIS data to inform the efforts of the individual Renewable Energy State Task Forces. These products were presented at the task force meetings and used by the Coast Guard representatives to provide initial recommendations. As the ACPARS WG was initially being formed, individual Districts were also requesting additional AIS products directly from the Coast Guard Navigation Center (NAVCEN). The products produced were generally in the form of heat maps such as the following examples in Figures 6 and 7:

[16] For a definitive list of vessels required to carry AIS see 33 Code of Federal Regulations Part 164

Appendix III

Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

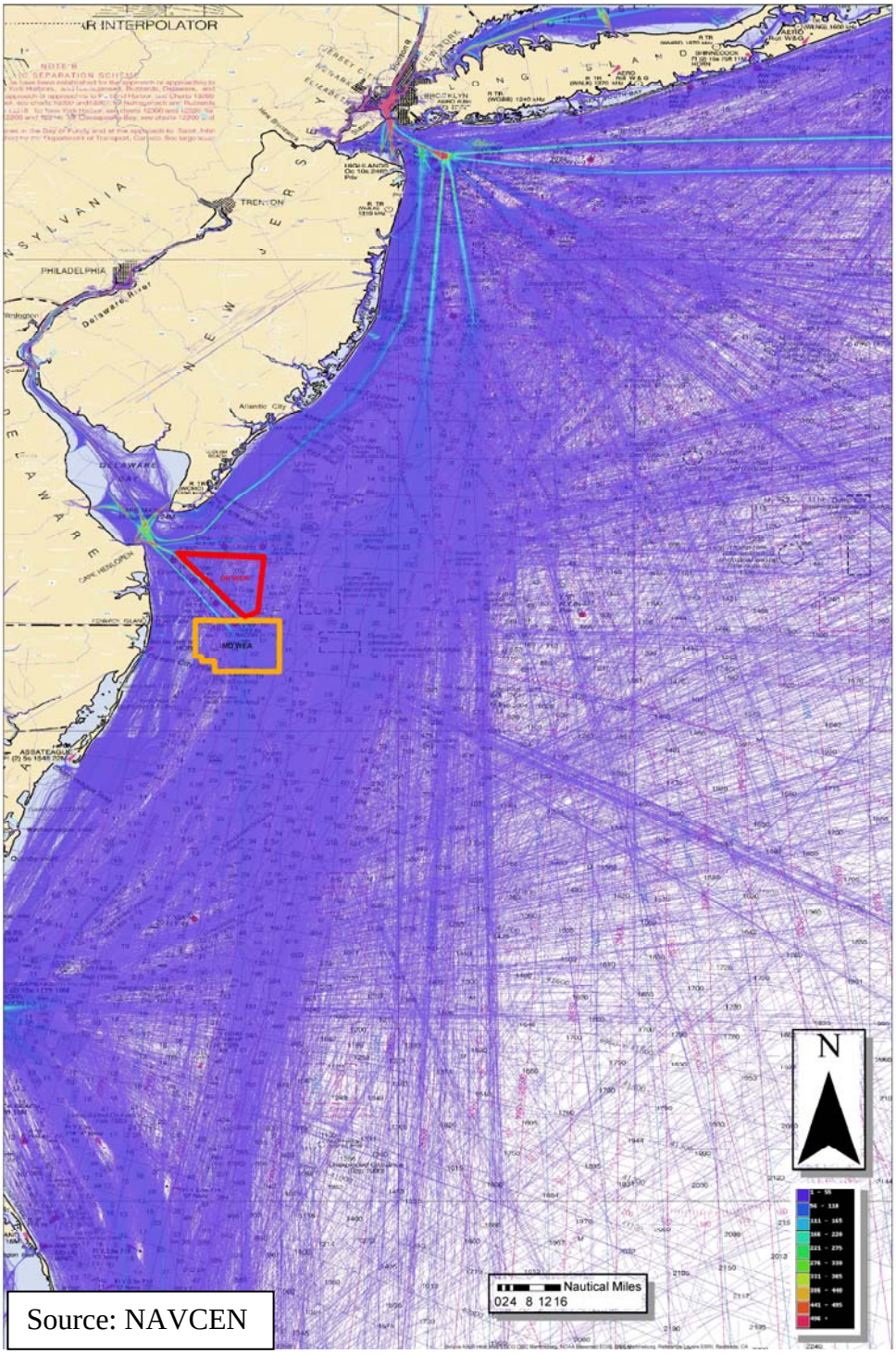

Figure 6 – Heat Map of the Mid-Atlantic showing the initial Delaware and Maryland proposed WEAs

Appendix III

Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

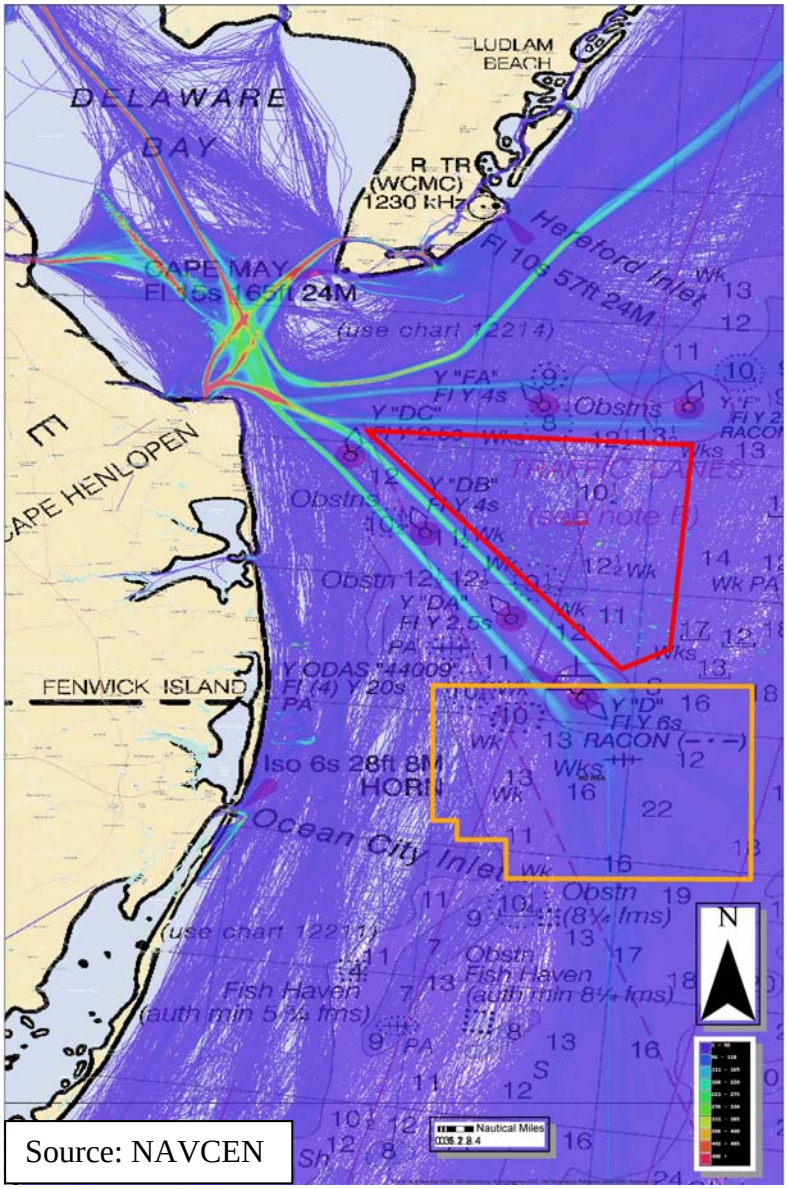

Figure 7 - Heat Map of Delaware Bay entrance showing the Delaware and Maryland initial proposed WEAs

"Heat map" is a term used for a depiction of line density or point density where the "hotter" color reflects a higher density. These initial products were useful as a starting point for discussions at the BOEM Renewable Energy State Task Force meetings, but the ability of NAVCEN to keep up with the demand for AIS products quickly overwhelmed the system. Historical data requests can require substantial expenditure of time and/or level of effort to produce data, depending on the nature of the request. For example; a request for a heat map in a discrete area (such as at the entrance to a port), for a period of one month, might take 5-7 days to produce.

Appendix III

Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

The ACPARS Workgroup formed an AIS Sub-group in April 2011 to coordinate the multiple requests and competing demands. The Sub-group attempted to define the needs for the entire Atlantic Coast. The Sub-group determined that although basic heat maps were useful, there was a need to fully characterize vessel transits by vessel type and direction to be able to better evaluate the impact of proposed WEA locations on vessel traffic. As the AIS data streams transmitted from the vessels contain multiple fields of data that are available for analysis, the products needed to fully support the ACPARS were much more complex than the heat maps provided by NAVCEN. To ensure validity of the products, the Sub-group recommended using no less than one year of data[17]and a combination of products including heat maps, density plots and trackline plots, which would also be further processed to show different vessel types, length, speed, draft, etc. "Density Plots," for the purposes of this report, refer to the number of vessels that transited through a defined area (such as an aliquot[18] or lease block) over a defined period of time. "Trackline plots" are a depiction of actual individual routes. Trackline plots proved useful to see all routes taken over a period of time or to see where particular vessel types transit.

At the direction of CG-6, requests for the more complex trackline and density plots were addressed to the Coast Guard Operations System Command Martinsburg (OSC). Communicating the precise requirements proved to be a challenging and iterative process. The initial requirements document to articulate the WG's AIS needs was finalized in mid-May 2011. The WG was advised that products for the initial seven wind energy areas should be completed within a two week period and the remainder of the Atlantic Coast should be completed within four to six weeks. OSC planned to provide the products as a GIS service that could be viewed using the Coast Guard Enterprise GIS tools on the Coast Guard Standard Workstation.

The AIS products for the first seven states proposing areas for offshore wind energy development, including Massachusetts (MA), Rhode Island (RI), New Jersey (NJ), Delaware (DE), Maryland (MD), Virginia (VA) and North Carolina (NC), were not completed as expected. The initial NJ products were not made available in time to respond to BOEM for the Call for Information and Nominations for the NJ WEA, which resulted in USCG Fifth District responding to BOEM in a general manner, rather than making specific suitability determinations. The initial AIS products for NC were provided in the form of multiple GIS service layers in June 2011. Layers were provided for individual months, but a complete year roll up was not. It was expected that the software would allow the selection of multiple layers that would automatically combine into a new layer. This did not work. The WG was unable to combine monthly plots into a cumulative density plot for the year, which was deemed necessary to adequately determine conflicts between proposed WEAs and shipping traffic. Delays in completing the combined NC layers resulted in the Fifth District being unable to provide input in the timeframe requested by BOEM.

[17]For the products produced by the Coast Guard, Calendar Year 2010 data was used.
[18] An aliquot is 1/16 of a lease block. A lease block is a 3 mile by 3 mile square.

Appendix III

Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

Eventually OSC combined the monthly layers for NC, providing the capability to look at density plots, heat maps and trackline plots by different vessel types for an entire year or by individual month. Also, trackline plots of individual vessel types could be superimposed over heat maps of all vessels for comparison, providing the ability to determine if a specific vessel type follows the flow of the majority of traffic. By comparing recreational vessels to a heat map of all vessels shown in Figure 8, the WG was able to substantiate that recreational vessels tend to keep closer to shore than other vessels.

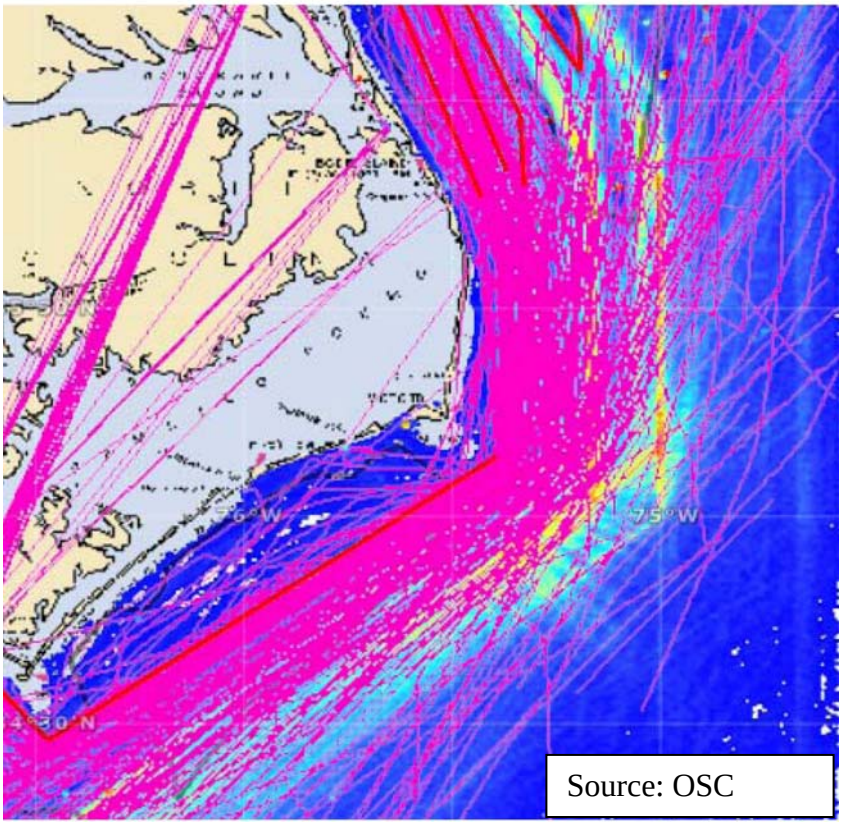

Figure 8 - Heat map of Cape Hatteras, NC with a trackline plot of recreational vessels (pink) layered on top

(Note: While AIS provides the best available data on vessel transits, there is some risk of errant tracklines being created when AIS data points are connected after interruptions occur in a signal being received or if transponders were turned off for a period of time.)

After completing the NC layers, CG-6 determined that the level of effort necessary to meet the study's AIS requirements could not continue to be supported by OSC. An interim solution was agreed to by CG-5PW, CG-6, and CG-7 to have OSC provide density plots of the remaining wind energy areas until a permanent solution was achieved.

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Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

The density plots created by OSC calculated the density of all vessels at the aliquot level for the 2010 Calendar year. The density plots were provided in an Adobe© PDF file format and not as GIS layers. This meant that the WG lost the ability to compare the density plots to other layers, such as wind energy areas. Figures 9 and 10 are some examples of the density plots where vessel density is displayed by varying colors, ramping from cold to hot with increasing density. Specific vessel counts are provided for each aliquot, which can be seen in Figure 10.

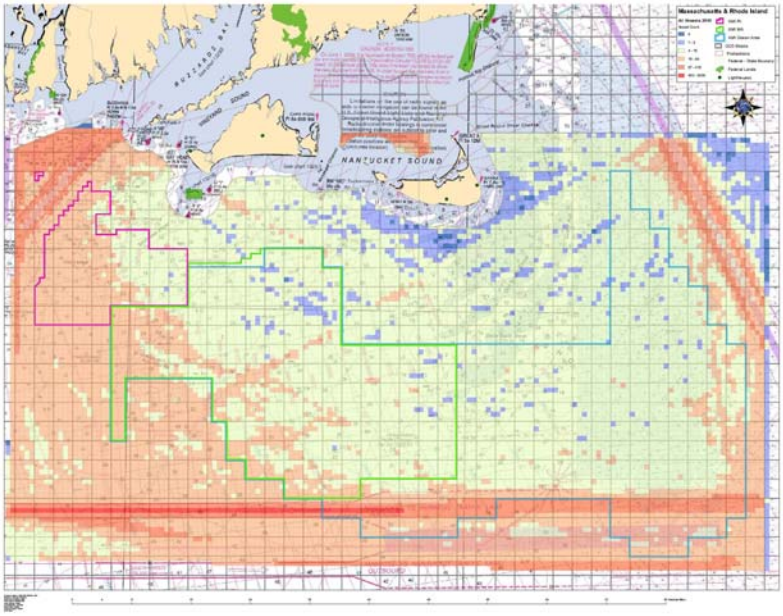

Figure 9 - Density plot of MA and RI Wind Energy Areas

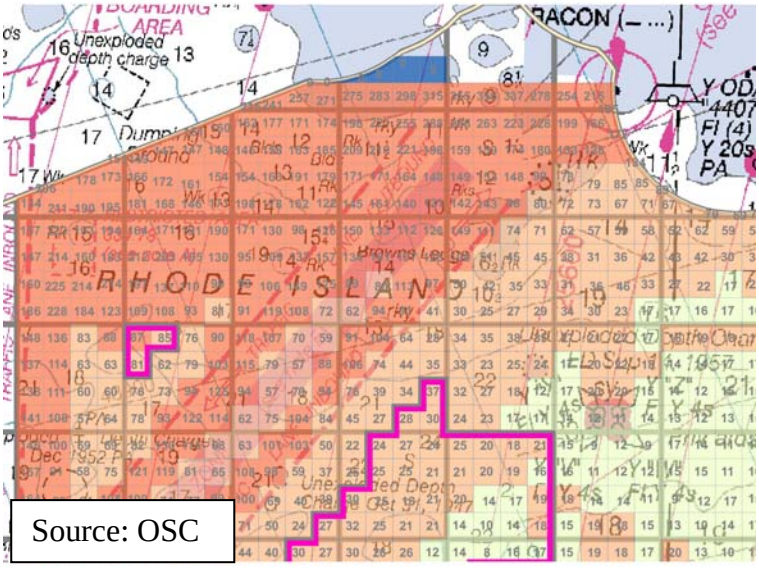

Figure 10 - Density Plot of Entrance to Buzzards Bay

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Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

In addition to AIS products produced by the Coast Guard, NOAA processed AIS data. In November 2011 NOAA hosted the WG at their offices in Silver Spring, MD. NOAA had been processing AIS data for the near shore area along the Atlantic and Gulf Coasts. Prior to the work session the WG requested that NOAA process AIS data for the offshore areas of the Atlantic Coast seaward to the EEZ. NOAA was able to include the offshore AIS data, but due to time constraints, was unable to process the data to the same level of detail as the inshore data. Figure 11 is a heat map created by NOAA showing the Atlantic Coast.

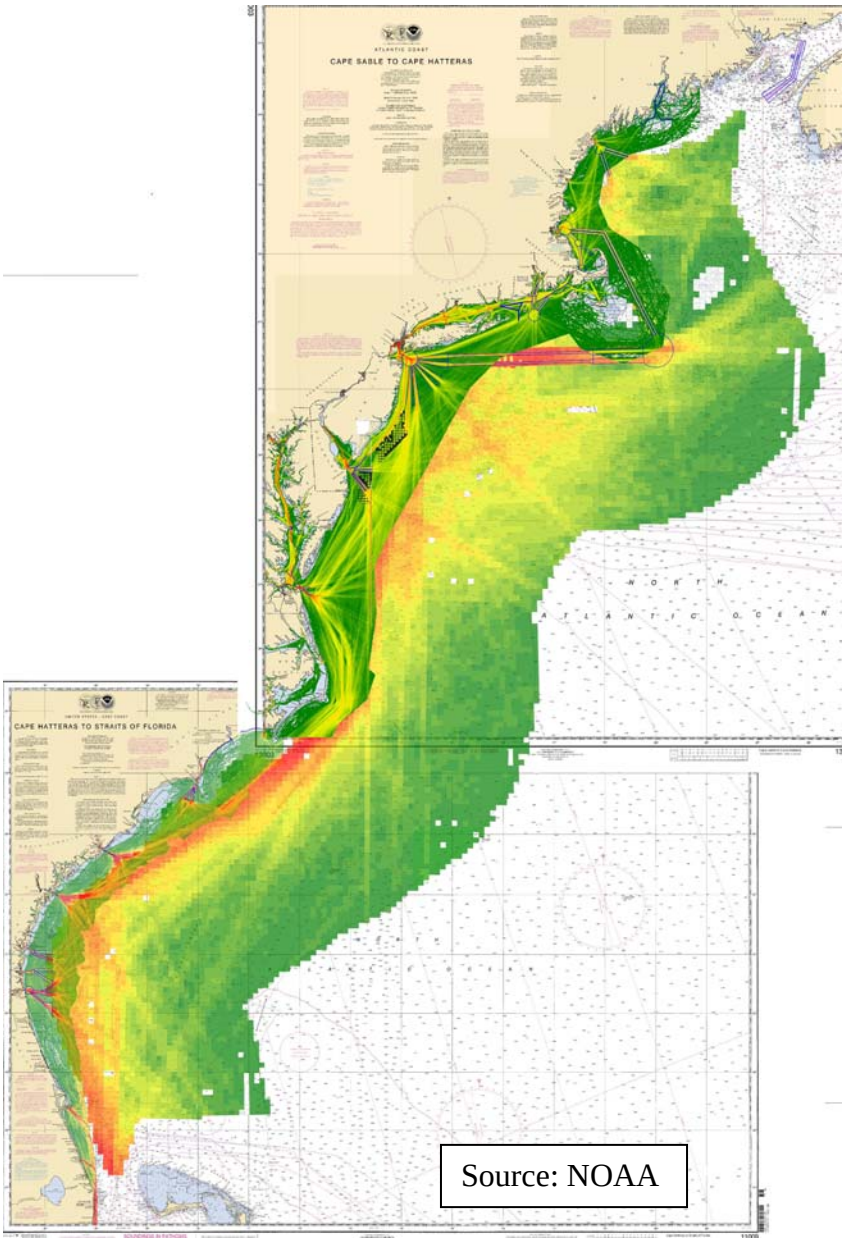

Figure 11 - Atlantic Coast Heat Map

Appendix III

Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

The GIS layers provided by NOAA were the first products that enabled the WG to review AIS data for the entire Atlantic Coast and the first graphic depiction of vessel traffic further offshore. NOAA delivered the AIS data layers in a format allowing the WG to view the layers using MapInfo© GIS software. Although not as readily available as the enterprise GIS tools, both District One and District Five (co-located with LANTAREA) have the software. The advantage of using GIS software over PDF files or picture formats such as JPEG files is that additional layers can be added and compared to the AIS data.

Viewing the AIS layers using GIS software enabled the WG to view near-shore and offshore routes throughout the entire Atlantic Coast. In many cases the routes traditionally used by vessels are readily apparent when looking at the AIS data through this display. In other cases, such as much of the area offshore of New York, there are areas of high vessel density where individual routes are not discernible.

In Figure 12, below, there is an apparent traffic corridor depicted by the yellow area approximately 28 NM wide that appears to consist of multiple routes that converge in the area east of Cape Hatteras, NC.

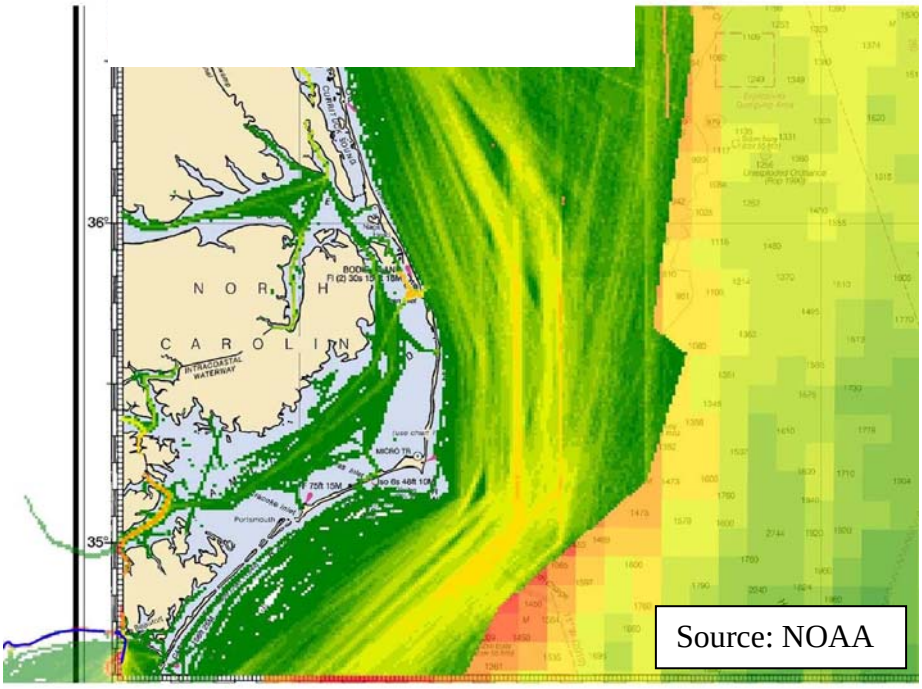

Figure 12 - Cape Hatteras Heat Map

Trackline plots of individual vessel types in this area demonstrated some natural segregation of tug and barge traffic from larger deep draft vessels. Tugs and barges transit closer to shore and hug the buoy line along the coast, whereas deep draft vessels are more spread out across the corridor.

Appendix III

Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

Further analysis is needed to determine if other patterns exist. For instance, are individual routes naturally segregated by other characteristics such as vessels travelling in opposite directions? or To what extent other factors such as the Gulf Stream current impact vessel routes?

Figure 13 is an example of the benefits of AIS layers in a GIS format. Using GIS software, multiple layers can be created and compared. For example, NOAA was able to plot routes recommended by a federal pilot in the area adjacent to the Delaware Bay entrance. Note: the recommendations were submitted in writing during the public comment period and were intended to resolve any conflicts presented by the proposed WEAs for Maryland (MD), Delaware (DE) and New Jersey (NJ).

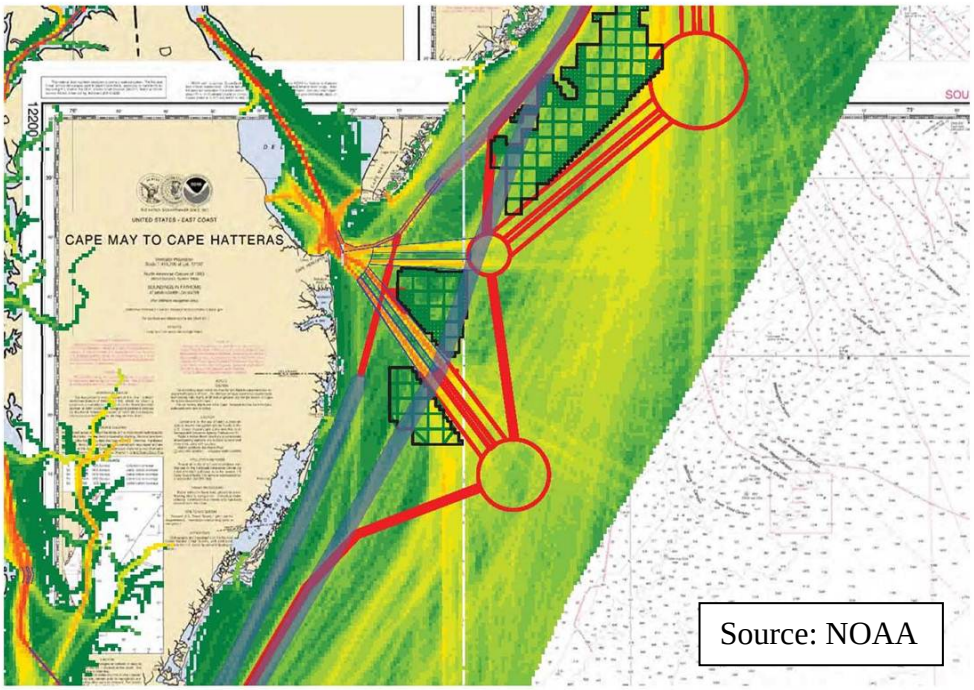

Figure 13 - Entrance to Delaware Bay Heat Map with NJ, DE and MD WEAs and routing measures proposed in public comments

The thicker blue lines represent existing tug and barge routes. The red lines represent the recommended routes. The recommended routes would result in alongshore tug and barge routes being pushed either further offshore or inshore. The southernmost recommended precautionary area would be approximately 35 miles offshore.

Appendix III

Coast Guard efforts to determine traditional shipping routes using Automatic Identification System (AIS) data

Figure 14 is another example of comparing AIS data to recommended routes using GIS software. The picture on the left is a graphic submitted to the docket and the picture on the right is the re-creation of the proposed routes layered on top of an AIS heat map.

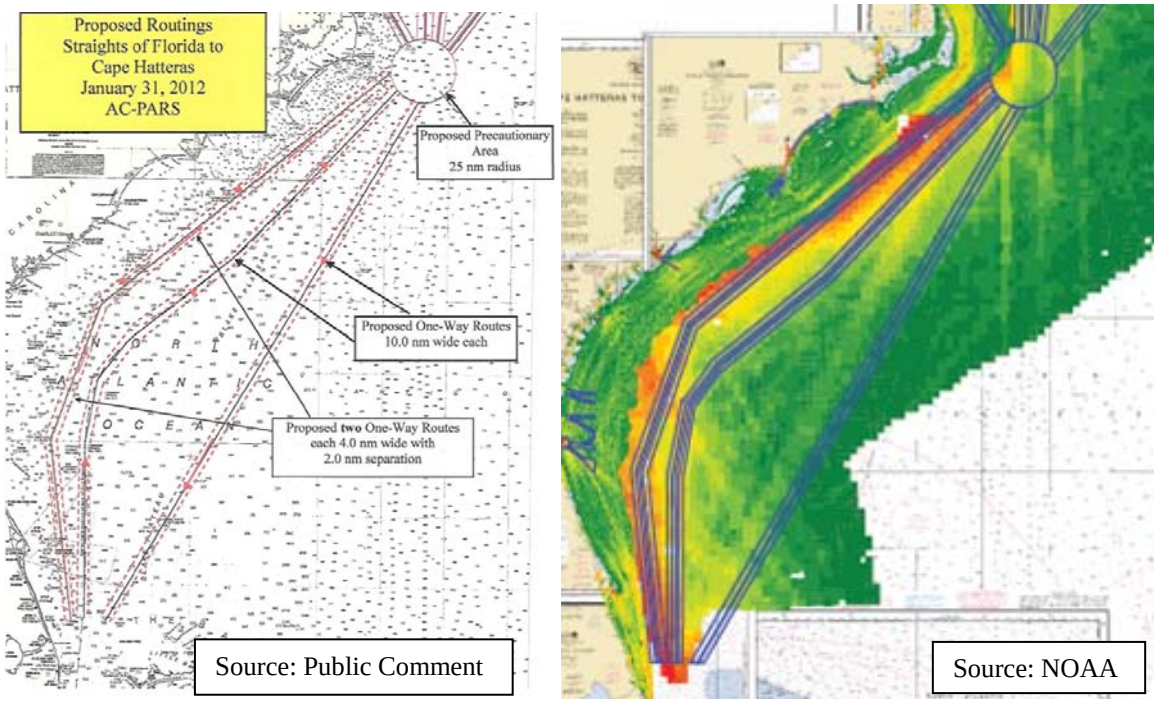

Figure 14 - Recommended routing measures from Cape Hatteras to Straits of Florida (Left) and same recommended routing measures overlaid on a heat map (Right)

The proposal was for a single 10 mile wide lane heading southbound directly connecting the proposed Cape Hatteras Precautionary Area to a point off the Straits of Florida. This is the lane shown all the way to the right (east). The equivalent northbound lane is the one in the middle and, according to the submission, was designed to follow the approximate axis of the Gulf Stream. The lane on the left is a proposed two-way route running alongshore that would accommodate smaller vessels. This scenario is a perfect example of why the WG desires the ability to manipulate AIS data. In this case, the WG would like to be able to determine if these depictions reflect current traffic patterns. There is a line of higher density that approximates the southbound lane but is located just a little further west. If the WG were able to analyze the data, it could determine if the northbound and southbound lanes correlate to the AIS data.

As demonstrated in the few previous examples, the Coast Guard's limited capability and capacity to process and analyze AIS data in a GIS format has impaired the WG's ability to fully exploit the information contained within the AIS data.

Appendix IV

Summary of Public Comments

The public submissions to the docket were reviewed and specific comments and/or recommendations were identified, resulting in a total of almost 300 individual comments. These comments were grouped into categories for organizational purposes. (Please note that the separation and categorization of comments were subject to the interpretation of the individuals conducting the task.) Below are the summaries for each of the categories listed in alphabetical order. Please see the Federal Register Docket Number USCG-2011-0351 for the actual submissions.

1. Anchorages- There were two recommendations made to establish anchorages along the sides of the existing Henlopen to Delaware TSS because traditional anchorages areas may not be available due to the construction of wind turbines. One anchorage should be located on the east side of the TSS and the other on the west side.

2. Assistance- Three comments included offers to assist the Coast Guard with subject matter expertise in various areas.

3. Buffer/Buffer Zone/Separation Distance- Comments included: buffer zones should generally increase as vessel operating speeds increase; develop clear mandatory buffer zones; and a recommendation for flexibility in determining exclusion zones on a project by project basis.

Nineteen comments recommended specific minimum distances from routing measures and traditional routes to the outer boundaries of wind farms. The recommendations ranged from 0.5 NM to 2 NM and another comment recommended 3NM when vessels are transiting at 20+ knots. One comment referenced the UK Maritime Guidance Note 371 in which 2NM is the minimum distance for "low risk" of collision.

The distance between adjacent wind farms was addressed in two submissions both of which recommended 6-8 NM as the minimum distance, but also stated more room is always preferred.

One comment recommended that wind farms not be sited within 20NM from port access routes due to the potential of routes being chronically beset by fog created by the wind wakes from the turbines.

4. Cost Benefit Analysis- Three recommendations were made that the Coast Guard perform a cost benefit analysis to improve its understanding of the effects of modifying the current vessel routing system on society as a whole and to consider the benefits of wind energy when considering the preservation of navigational routes.

5. Environmental Impacts- Five comments were made concerning potential impacts to right whales and requested impacts to right whales and other large mammals be considered if routing measures are changed or created. A concern was also raised that the funneling of ships into port

access routes could affect the ability of ships to comply with speed limitations during periods of Right Whale Seasonal Management Areas or Dynamic Management Areas.

6. Hazards- Thirty seven comments were received regarding the various general hazards affecting marine navigation and how wind farms and routing measures could impact navigation. General hazards include weather (sea state and visibility), currents, shallow water, shoals, obstructions, wrecks, and other vessels. Two of the comments from tug and barge representatives suggested that recreational and fishing vessels are the biggest hazard

Comments specific to additional hazards posed by wind farms included fixed obstructions, increased vessel density, mixing of vessel types, radar interference and changes to the environment (fog). Comments on routing measures were that they may increase vessel density, but could also improve predictability of large vessels.

7. Navigational Aids- A recommendation was made to relocate the buoys in the main deepwater approach channel to Hampton Roads to encourage captains to utilize the entire travel lane.

8. Precautionary Areas- As part of an overall routing system proposed by a federal pilot, five recommendations were made to create specific precautionary areas at the junction of multiple routing measures.

9. Routes- Several comments were received concerning how vessels determine routes. The recurring theme was that vessels take the most direct, safe route, minimizing time and distance. Several comments noted that many routes have existed for centuries.

10. Tugs and Barges-Tug and barge combinations routinely transit close to the coastline to take advantage of the lee during prevailing west and northwest winds. In heavy sea states stern tows may be required to slow down, increase wire length and seek deeper water to account for the additional catenary.

11. Routing Measures- More than one hundred comments were related to routing measures. Several submissions by an individual federal pilot recommended alongshore routes and precautionary areas for the entire Atlantic Coast that together would form a complete coastwise routing system. Special note: These recommendations accounted for WEAs that had already been proposed or discussed. In addition there were recommendations specific to the Hampton Roads approaches as well as suggestions to establish tug and barge safety fairways from Delaware Bay to Chesapeake Bay and Delaware Bay to New York Harbor.

Several comments recommended minimum widths of lanes, separation of vessels traveling in opposite directions, separate near shore and offshore routes to accommodate different vessel types, and larger lanes for vessels traveling at higher speeds or in areas that would otherwise not be in restricted navigation.

Appendix IV

Summary of Public Comments

A recurring theme in many of the general comments was that any routing measures not be made mandatory to give the vessel captain the most flexibility in ensuring a safe transit. Some comments from mariners recommended against routing measures that increase traffic density where there is currently no strain on the existing system and vessels can naturally segregate and avoid each other. Others recognized that the introduction of wind farms may require routing measures to preserve navigational safety.

Wind developers were concerned that routing measures could be designated on limited information and that to protect navigational safety it would be necessary to err on the side of caution, removing prime wind development sites unnecessarily. Many areas show a clear need to protect safety, but when situations are less clear it was recommended areas be highlighted and a recommendation made that this area will require further study.

12. Risk Assessment- A developer recommended UK Maritime Guidance Notes 371 and 372 as well as the "Methodology for Assessing Marine Navigational Risks of Offshore Wind Farms" as useful reference points, as they have been developed over many years of consideration and dialogue between industry, shipping and navigation interests and relevant Government departments in the UK. (Note: UK Maritime Guidance Note 371 was used as a starting point for developing the ACPARS Working Group's Red-Yellow-Green methodology, Appendix VII.) One comment from a shipping association recommended changes to routing measures should only occur after completing a risk assessment and only if the assessment shows that navigational safety would be improved. Another comment suggested all decisions on the placement of structures should be based on a risk assessment.

13. Siting- Twenty comments were made related to siting. Several comments called for the preservation of traditional routes over new uses. There were recommendations that wind farms be built a minimum distance offshore to allow tug and barge traffic to transit near shore. Another recommended they only be built offshore of the Gulf Stream. One wind developer recommended that the existing WEAs not be decreased in size. Developers have expended substantial resources and it would be very disruptive to the offshore wind industry. A few comments recommended that no WEAs be finalized or leases issued until marine spatial planning is completed. A recommendation was also made to consider the presence of undersea cables when siting.

14. Watchstanding- Four comments were received regarding watchstanding and other operational requirements that could be impacted by designating coastwise routes. If the routes create restricted navigation situations it is common practice for the vessel's captain to be on the bridge. Also, higher vessel density combined with fewer options to avoid collisions increases the traffic management burden. On traditional tug and barges towing astern on a wire, restricted navigation could lead to situations with unnecessary shortening of the tow wire, requiring crew call-outs and situations where it is difficult to keep the tow wire off the bottom while maintaining enough catenary in a particular sea state. However, some comments indicated one way routes and organized traffic patterns may simplify bridge management.

Appendix V -

Public and Stakeholder Outreach

1. Local/Regional Outreach- Upon release of the ACPARS Federal Register (FR) Notice of Study, Coast Guard Sector Commands began contacting their local port stakeholders. To support the Sectors' outreach efforts, the WG provided guidance on the expectations and developed a number of items to assist with capturing vital stakeholder input and explain the ACPARS. These items include:

a. ACPARS Port Level Outreach Brief: Assisted Sector commands with spreading the word on ACPARS;

b. Tri-fold flyer: Easy to read handout that explained in detail, what the ACPARS is and what it hoped to accomplish, information on how to submit comments to the Federal Register, key WG contact information, and a generic PARS timeline; and

c. FAQs: three page document outlining questions that the WG gauged most stakeholders would ask.

The workgroup also defined the following goals for the Local/Regional Outreach

a) Identify core port stakeholders (i.e. pilots, port authority, harbor safety committees, port safety and security committees etc);

b) Identify significant Industry stakeholders (i.e. shipping companies, commercial fishermen, towing companies, etc);

c) Identify underrepresented groups and small entities (i.e. tribal entities, charter fishing, whale watching, sport fishing, diving, etc);

d) Identify all other likely stakeholders with a nexus to the port (i.e. recreational boating businesses and associations, local government entities with a marine presence such as Police Department, Federal government entities with local marine interest, etc);

e) Identify groups that may not be directly connected to the port but can relay and multiply the message (i.e. Chambers of Commerce, local trade associations);

f) Identify pertinent local information such as tides, currents, and weather;

g) Determine present vessel traffic patterns and density;

h) Determine existing waterway uses;

Appendix V -

Public and Stakeholder Outreach

i) Determine why vessels transit where they do;

j) Determine conflicts with proposed waterway uses;

k) Identify possible mitigation measures to enable the coexistence of competing uses;

l) Determine locations where sensitive environmental or ecological events occur;

m) Determine locations where Department of Defense, National Aeronautics and Space Administration or other US agency activities occur in the port region;

n) Determine locations where commercial fishermen routinely frequent and what fishery resource is being exploited;

o) Determine locations where alternative energy sites for testing and commercial exploitation are under consideration or are being planned;

p) Determine locations and nature of any other notable waterway uses;

q) Identify and evaluate trends and recurring topics of concern in waterway stakeholder comments; and,

r) Identify any port-specific topic, location, or other factor that is of unusually high political, media, or commercial sensitivity.

Appendix V -

Public and Stakeholder Outreach

2. Targeted Outreach to the Towing Vessel Community- During the initial public comment period the WG received minimal feedback from the towing vessel community on how the potential placement of wind farms proposed along the Atlantic Coast may impact them. In an effort to garner this much needed data, with the help from professional tug and barge mariners, the WG developed a list of questions specifically geared towards the towing vessel community. These questions were distributed through the CG towing vessel coordinators' networks The list is as follows:

a) Where do you normally sail along the East Coast?

b) Where are your outside navigation routes?

c) What factors do you consider in your voyage navigation planning for these transit routes?

d) What navigational hazards concern you when you're sailing along your track off the Atlantic coastline?

e) If you sail in the northeast, are the current vessel routing and traffic schemes, as marked on your charts, such as the recommended traffic separation lanes through Block Island Sound, Narragansett Bay, and Buzzards Bay, the right sizes and directions to fit into your voyage plan? Do they go where you need to go? Do the routes need to be different, longer, shorter, or wider? How heavy is the traffic in the vessel routing and traffic schemes you presently transit?

f) For the routes listed above, are changes needed to address hazards and improve traffic safety and efficiency?

g) What impacts, both positive and negative, would changes to existing routing schemes and measures have on the sailing area(s) that you normally operate in? Are new routing measures and schemes needed?

h) How are your vessel's outside coastal routes affected by seasonal weather patterns (winter/summer) or by storms or other adverse environmental conditions you've experienced along the Atlantic coastline? Under what conditions do you stay closer to the beach or move further offshore?

i) Do you think the Coast Guard should create designated fairways, traffic separation schemes for vessels, or exclusion/restricted areas around wind farms where you must honor such restricted areas if the wind farms are built? Would you prefer wind farm exclusion/restricted areas where you can navigate anywhere *outside* of the wind farm or would you prefer to restrict your navigation *inside* designated coastwise fairways and traffic separation schemes *around* the wind farms?

j) Could the creation of designated coastwise routes and additional traffic separation schemes adversely impact watch-standing or other operational requirements?

k) If coastwise vessel fairways and traffic separation schemes were created to accommodate wind farms, should designated vessel fairways be devised to separate the different vessel types such as tug and barge vs. deep draft vessels vs. fishing vessels vs. recreational vessels?

l) Should there be separate lanes for vessels travelling in opposite directions along the coast, like a highway with a center median?

m) Should participation in any coastwise traffic scheme be voluntary or mandatory for all, or specific, classes of vessels, such as tugs and barges?

n) What is the minimum safe width of coastwise traffic separation schemes and lanes considering varying sea state, weather conditions and yet be able to accommodate medium amounts of vessel traffic safely? Are there particular Atlantic coast areas where the width of the separation schemes and lanes should be smaller or larger for navigational safety considerations?

o) What should the minimum separation be between different, adjoining wind farms in order to provide safe navigation between or around those wind farms?

p) Any other comments you may have.

3. Letters to Industry- During the second round of comments the Commander, Atlantic Area invited comments directly from industry and stakeholder organizations. The intent was to solicit comments from organizations that had not commented and alert the others that the docket was reopened for additional comments. Letters were sent to the Virginia Maritime Association, the Virginia Port Authority, American Waterways Operators, Renewable Energy Systems Limited, Offshore Wind Development Coalition, North Atlantic Ports Association, Mariners Advisory Committee for the Bay and River Delaware, Boston Harbor Pilot Association, APEX Wind Energy, World Shipping Council, Pilots Association for the Bay and River Delaware, New York Shipping Association, INTERTANKO, Cruise Line International Association, Chamber of Shipping of America and American Association of Port Authorities.

Appendix V -

Public and Stakeholder Outreach

4. Public Website- To better communicate to all potential stakeholders, the WG developed a website[19] to bolster outreach efforts. The website provides the following information:

a) Contact information to key WG members;

b) Frequently asked questions regarding the ACPARS project;

c) Detailed instructions on how to submit comments to the docket;

d) Automatic Identification System (AIS) data from Maine to Florida;

e) ACPARS timeline; and

f) Related links to partner websites.

5. National Level Outreach: The Coast Guard Director of Marine Transportation Systems and his staff have been engaged with other Federal agencies, maritime industry, wind development organizations and other key stakeholder groups through meetings, presentations and public forums. In particular, the Director has been very engaged with the Bureau of Ocean Energy Management (BOEM) Office of Renewable Energy, the Director of BOEM and the Department of Interior, Deputy Assistant Secretary for Land and Minerals. Other outreach included the Department of Energy, the Marine Board of the Transportation Research Board, Marine Log Conference, Maritime Executive Conference, Maritime Law Association, Offshore Wind Development Coalition, Environmental Law Institute, World Ocean Council, Center for Environmental Quality, Committee on the Marine Transportation System Coordinating Board, the Offshore Wind Accelerator Project, Atlantic Wind Connection and executives from several shipping industry associations.

These engagements have resulted in developing key working relationships between the federal agencies and information sharing opportunities across the spectrum of stakeholders. Sharing information at higher levels between these various agencies and organizations provided insight to the leadership that enabled each of the agencies or organizations to guide efforts and ensure continued cooperation.

[19] http://www.uscg.mil/lantarea/acpars/

Appendix VI

The Marine Transportation System

The MTS consists of waterways, ports, and intermodal landside connections that allow various modes of transportation to move people and goods to, from, and on the water. The MTS includes 95,000 miles of coastline and 361 ports from the largest mega-ports to the smallest fishing harbors and marinas. There are approximately 70 deep-draft (over 14' depth) ports with nearly 2,000 major terminals, and more than 1,800 shallow-draft terminals. Approximately 40 of the 70 deep draft ports have channels with a depth greater than 40'. All large East Coast ports have deepened their channels to at least 42 feet in anticipation of the growth in commercial shipping activities and size of ships, with three ports (NY/NJ, Norfolk, Baltimore) which have at least a 50 foot depth (NY/NJ is in the process of dredging to the 50 foot depth).[20]

The MTS is vital to the U. S. economy. Waterborne cargo and associated activities contribute more than $649 billion annually to the U.S. GDP and sustain more than 13 million jobs. MTS activities contribute over $212 billion in annual port sector federal/state/local taxes. Over 45 million TEUs (twenty-foot equivalent units) and 1.5 billion tons of foreign traffic were handled in 2006, with a value of nearly $1.3 trillion dollars. Remarkably, 99% of the volume of overseas trade (62% by value) enters or leaves the U. S. by ship.[21]

In addition to maritime trade, the near coastal zone supports many other maritime industries vital to the U. S. economy. According to the NOAA National Marine Fisheries Service, in 2009 the U.S. seafood industry supported approximately 1 million full- and part-time jobs and generated $116 billion in sales impacts, $32 billion in income impacts, and $48 billion in value added impacts. An average of 12 million anglers fished in the United States annually from 2001 to 2009. In 2009, recreational fishing supported 300,000 jobs, generated $50 million in sales and $23 million in value added impacts[22] Tourism and recreation in the ocean sector employs over $1.7 million employees and contribute nearly $70 billion GDP.[23]

To understand and balance the many varied uses of the MTS, it is important to consider future trends. The WG identified three major areas that may impact future uses of the Atlantic Coast waters including the expansion of the Panama Canal, the Maritime Administration's (MARAD) America's Marine Highway Program, and future exploitation of energy resources on the outer continental shelf.

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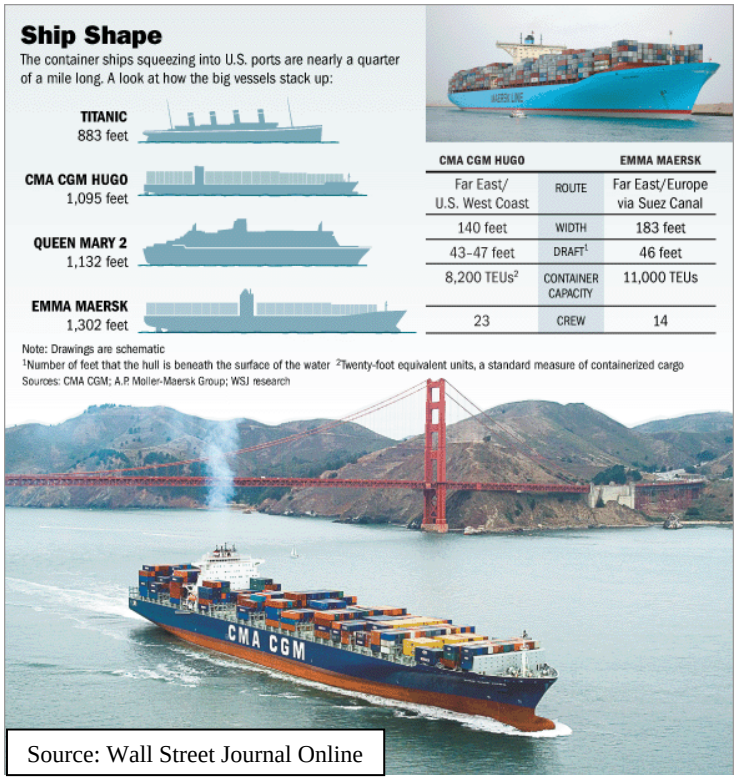
[20] http://www.supportthedeepening.com/index.php?section=learn_more
[21] http://www.marad.dot.gov/ports_landing_page/marine_transportation_system/MTS.htm
[22] National Marine Fisheries Service. 2010. Fisheries Economics of the United States, 2009. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-118, 172p. Available at: https://www.st.nmfs.noaa.gov/st5/publication/index.html.
[23] http://oceanpolicy.com/about-our-oceans/tourism-and-recreation/

Appendix VI

The Marine Transportation System

1. Panama Canal Expansion- the Panama Canal is undergoing a $5.25 billion expansion scheduled to be completed by Aug. 15, 2014, 100 years to the day after it opened.[24] The Panama Canal will be able to accommodate vessels 1200' long, with 160' beams and 50' drafts. The expanded canal will have the capability to allow a 12,000 TEU containership to pass. Not quite large enough to accommodate the EMMA MAERSK, the Panama Canal expansion will nearly triple the size of container vessels able to transit the canal. The change is expected to significantly alter trade patterns to the U.S., shifting container vessels from the congested West Coast to the Panama Canal and the East and Gulf coasts.[25] In a USACE report on the Panama Canal, the container vessel fleet on the East Coast was projected to double both in the number and size of vessels.[26]



Source: Wall Street Journal Online

Figure 15 - Comparison of the World's Largest Ship's from the Wall Street Journal online[27]

[24] http://www.pancanal.com/eng/expansion/
[25] http://www.iwr.usace.army.mil/docs/iwrreports/whitepaperpanamacanal.pdf
[26] Derived from Table 3, pg. 19 of "U.S. Port and Inland Waterways Modernization Preparing for *Post-Panamax* Vessels," U. S. Army Corps of Engineers, Institute for Water Resources, 20 June 2012. http://www.iwr.usace.army.mil/docs/portswaterways/rpt/June_20_U.S._Port_and_Inland_Waterways_Preparing_for_Post_Panamax_Vessels.pdf
[27] Wall Street Journal Online, http://online.wsj.com/public/article/SB116044743245587716-J_w8ugovtC5Ha8Rnlex8KqpxHRk_20061016.html?mod=regionallinks

Appendix VI

The Marine Transportation System

2. America's Marine Highway Program- America's Marine Highway Program is a Maritime Administration (MARAD) program implemented in April 2010 through publication of a Final Rule in the Federal Register (75 FR 18095; April 9, 2010; MARAD-2010-0035). A key component of the Marine Highway Program is to designate Marine Highway Corridors, which are all-water routes that can serve as extensions of the surface transportation system. These corridors identify routes where water transportation presents an opportunity to offer relief to landside corridors that suffer from traffic congestion, excessive air emissions or other environmental concerns and other challenges. Designating these Marine Highway Corridors is a first step in focusing public and private efforts on the use of waterways to relieve landside congestion and attain other benefits that waterborne transportation can offer in the form of reduced greenhouse gas emissions, energy savings and increased system resiliency.[28]

Source: MARAD

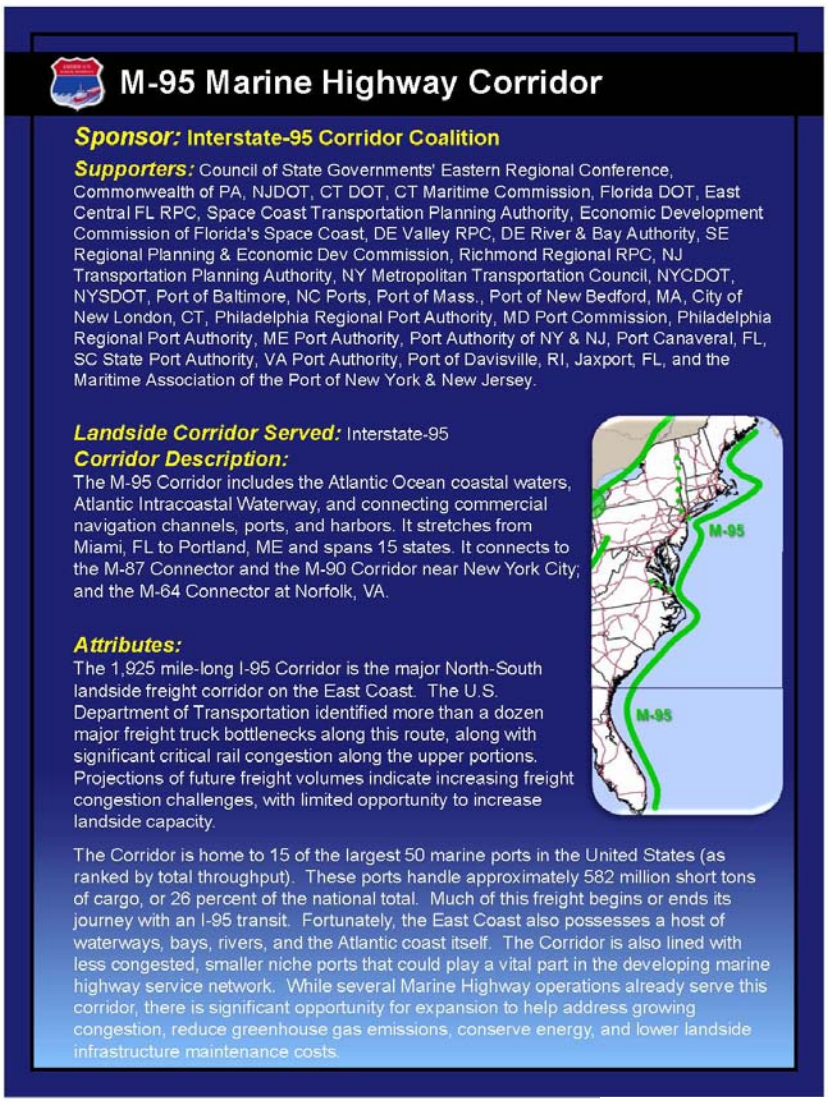
Figure 16 - America's Marine Highway Corridors

[28]MARAD, America's Marine Highway Program
http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm

Appendix VI

The Marine Transportation System

The primary corridor applicable to the ACPARS is the M-95 corridor that extends from Miami, FL to Portland, ME. The M-95 Corridor includes the Atlantic Ocean coastal waters, Atlantic Intracoastal Waterway, and connecting commercial navigation channels, ports, and harbors spanning 15 states.



Source: MARAD

Figure 17 - Description of the M-95 Marine Highway Corridor[29]

[29] http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm

Appendix VI

The Marine Transportation System

3. Energy- Offshore wind energy development promises to be a significant domestic renewable energy source. Figure 13 categorizes the average wind speed at 90 meters (m) above the surface and out 50 NM from shore (90 m above the surface is the approximate hub-height of many current-day offshore wind turbines)[30]. The National Renewable Energy Laboratory estimates the Atlantic Coast has 1,247GW of offshore wind potential[31].

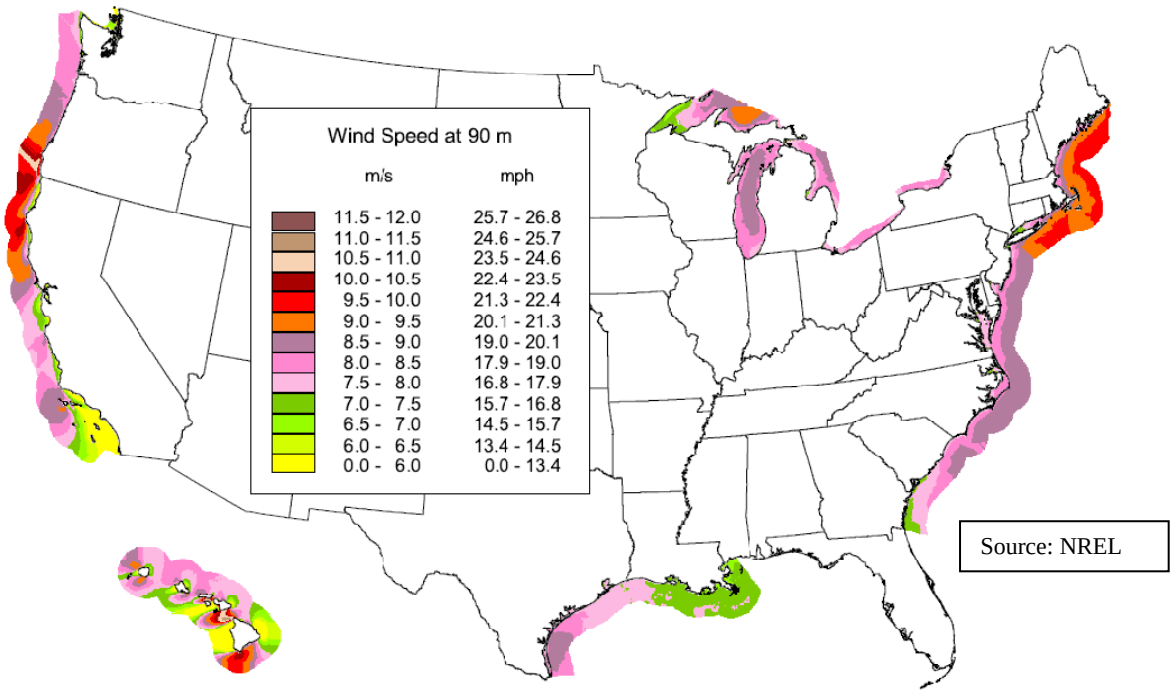


Figure 18 - United States offshore wind resource at 90m above the surface

Industry has also expressed an interest in exploring the offshore Atlantic waters for oil and gas exploration. In response to receiving several applications for conducting Geological and Geophysical Surveys, BOEM has released a draft Programmatic Environmental Impact Statement (PEIS) for conducting geological and geophysical surveys in the Mid-Atlantic and South Atlantic Planning Areas shown in Figure 19.[32]

[30] Assessment of Offshore Wind Energy Resources for the United States
Technical Report NREL/TP-500-45889 June 2010
http://www.windpoweringamerica.gov/pdfs/offshore/offshore_wind_resource_assessment.pdf
[31] http://www.nrel.gov/docs/fy11osti/51332.pdf
[32] http://www.boem.gov/oil-and-gas-energy-program/GOMR/GandG.aspx

Appendix VI

The Marine Transportation System

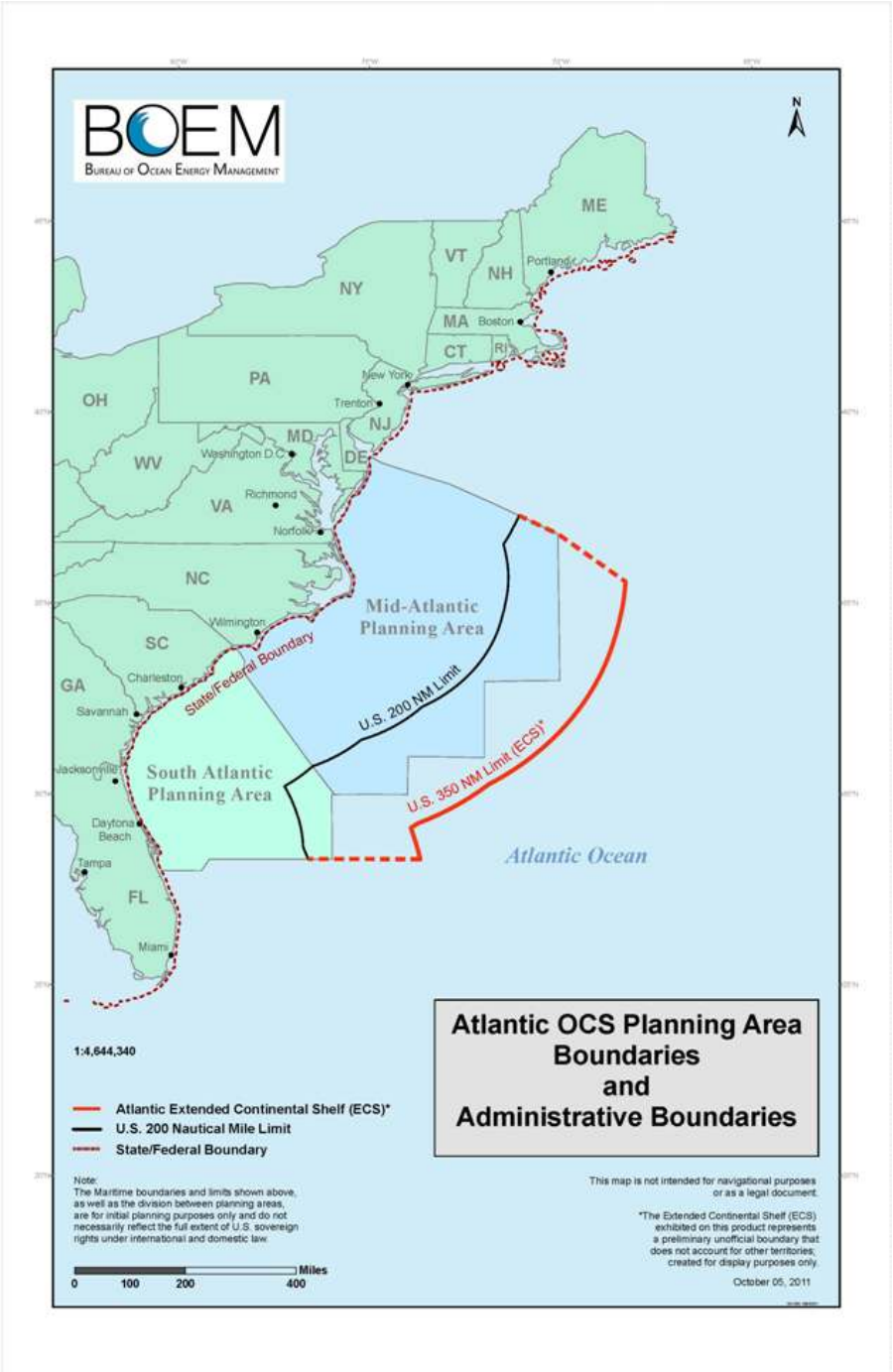


Figure 19 - Atlantic OCS Planning Area Boundaries

Appendix VII

Applications of the Red – Yellow – Green Methodology

R-Y-G Determination for Maryland (MD).

The first application of the R-Y-G Methodology was for the proposed WEA for MD. The Fifth District Waterways Management Staff estimated the western edge of the traditional navigation route to be a line drawn due south from the corner of the TSS (black line), see Figure 20. The red line represents 1NM from the edge of the route and the green line is 5NM from the edge of the route. Between the two lines the blocks would be labeled as Yellow. This resulted in the equivalent of about 6 lease blocks remaining if all of the Red blocks were removed from the area of consideration.

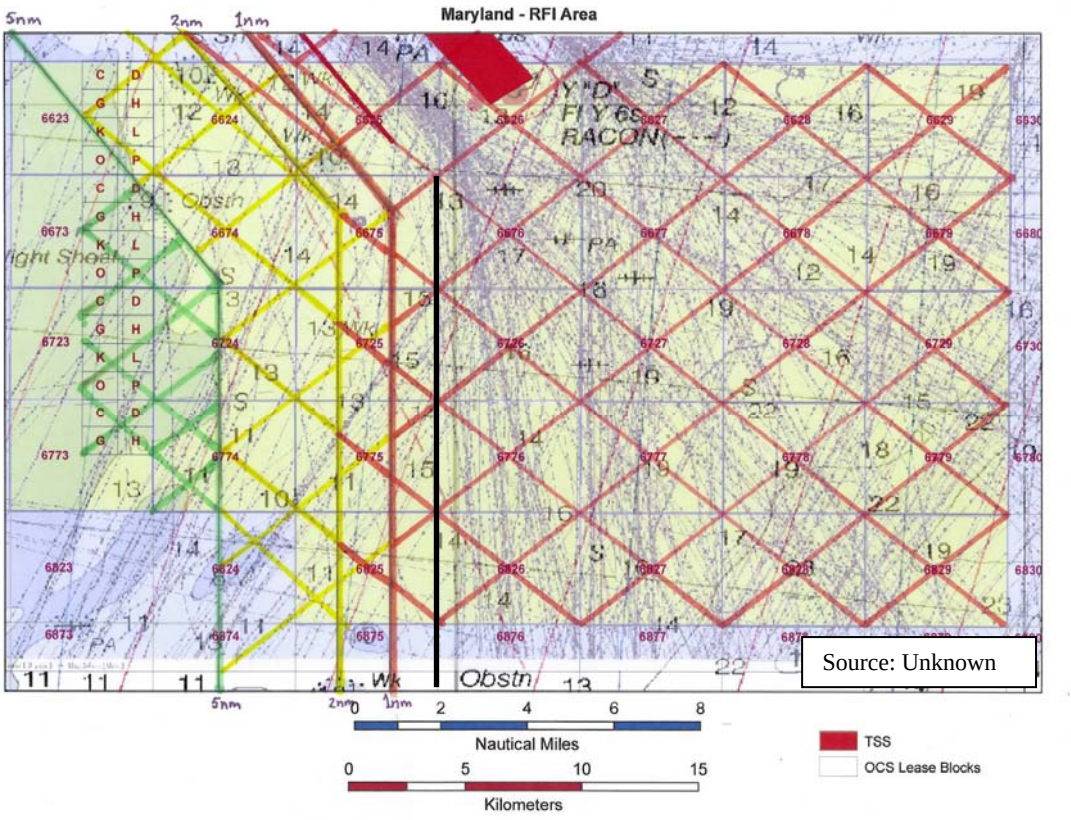


Figure 20 - Initial Fifth District application of the R-Y-G Methodology of the proposed Maryland WEA

In going through this process for MD, it was determined that after a strict application of the separation distances, the remaining blocks would not be sufficient to make the WEA viable for commercial exploitation. A subsequent decision was made to consider the possibility of the TSS being extended to allow inclusion of additional blocks, knowing that it was an iterative process and additional blocks could be removed later in the process if necessary. Extending the TSS would shift the southbound traffic route further east and leave additional lease blocks for further consideration.

Appendix VII

Applications of the Red – Yellow – Green Methodology

The final recommendation to BOEM resulted in the equivalent of approximately 11 lease blocks remaining in the area. The MD "Call" area is shown in Figure 21 below. The Coast Guard's official recommendation to BOEM is attached as Enclosure 3.

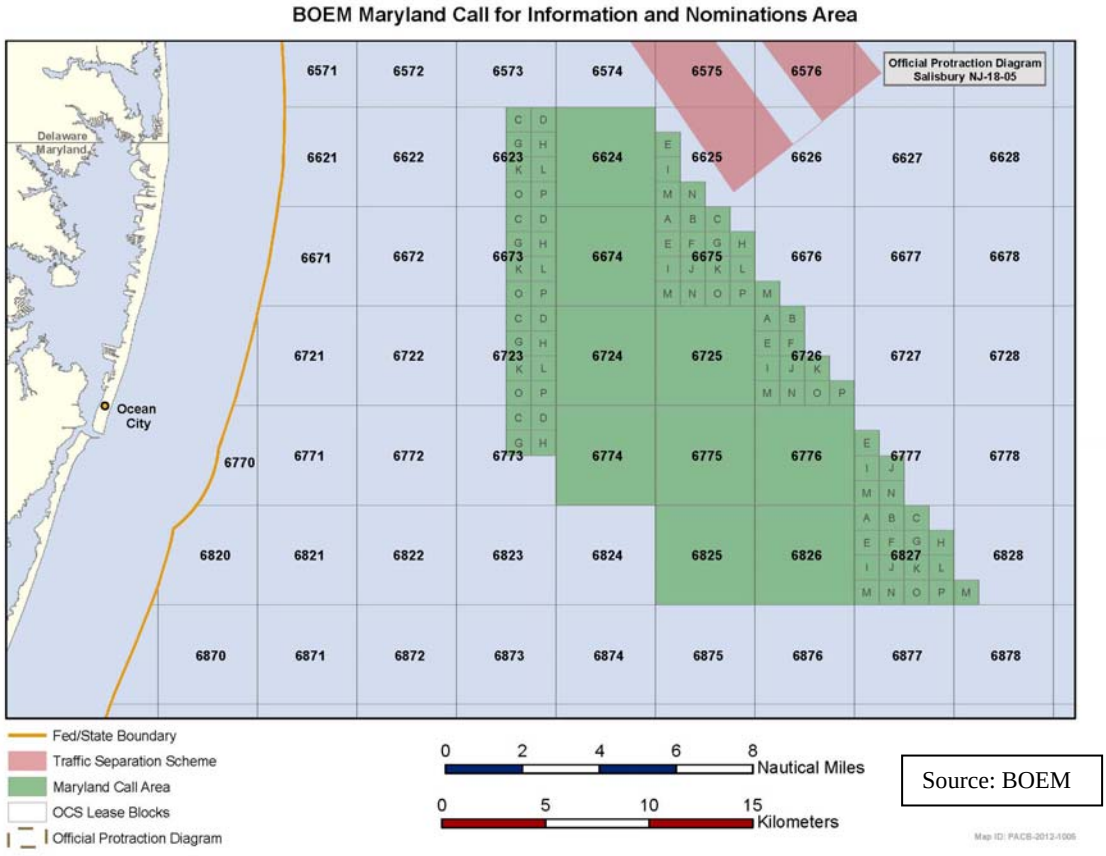


Figure 21 - BOEM Call for Information and Nomination Area for Maryland[33]

After the MD exercise, the R-Y-G Methodology was henceforth adjusted to allow for consideration of possible routing changes to preserve as many viable lease blocks as possible and facilitate the "Smart from the Start" process.

[33] Source: BOEM.

Appendix VII

Applications of the Red – Yellow – Green Methodology

R-Y-G Determination for the Massachusetts (MA) - Rhode Island (RI) Area of Mutual Interest (AMI).

The R-Y-G methodology was completed by the First District Waterways Management staff in May 2011. The R-Y-G determination did not require consideration of changes to routing and was able to be determined strictly based on distances from the shipping routes. The First District used GIS software to overlay the appropriate colors based on the R-Y-G methodology. Regions within 1 NM of a TSS were colored red, regions between 1 NM and 5 NM were colored yellow, and green was omitted because it is the default position. These products were then used to extract a specific list of R-Y-G classification for specific aliquots of each block, the results of which were adapted into an official response letter to BOEM attached as Enclosure 4. The results of the R-Y-G analysis shown in Figure 22 below resulted in BOEM removing the areas identified as red.

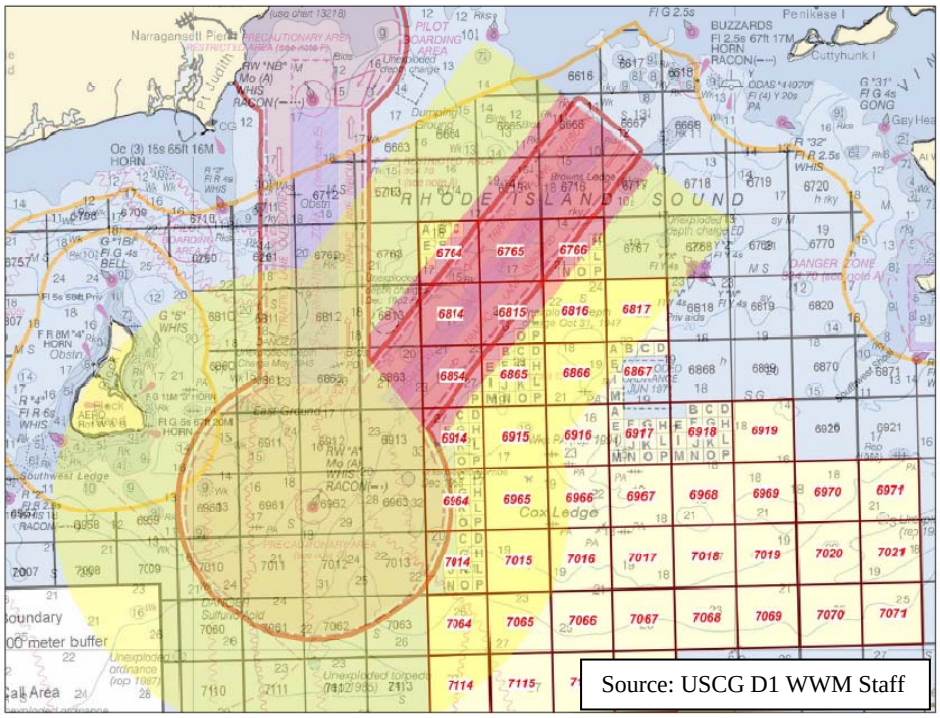


Figure 22 – MA-RI Area of Mutual Interest

Appendix VII

Applications of the Red – Yellow – Green Methodology

R-Y-G Determination for Virginia (VA).

Figure 23, below, is a vessel density plot that depicts one of the preliminary areas that was being considered for the VA WEA (blue box). The density plot clearly shows significant conflicts between shipping routes and the preliminary WEA. The existing route bisects the proposed area and then divides into four distinct routes.

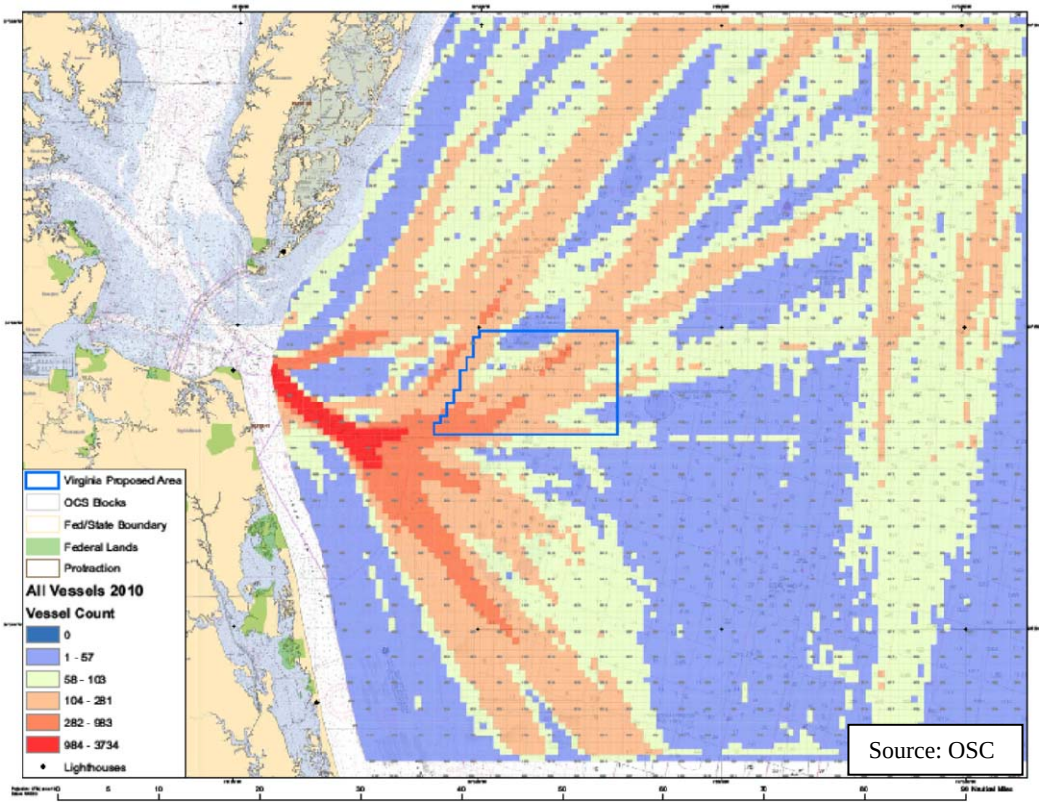


Figure 23 - Density Plot of VA displaying the initial proposed WEA

After several iterations, the area being considered was the only area remaining that could potentially be viable after other conflicts were accounted for. Meetings were held between the various port stakeholders who expressed an interest in identifying a solution to enable wind energy development, while minimizing impacts to shipping. Options to route vessel traffic around the proposed wind energy area were proposed. Recognizing solutions to de-conflict the proposed area and vessel traffic may be plausible, the Fifth District completed a R-Y-G assessment. Some of the western areas were designated as Red based on recommendations to account for heavy weather routes taken by tugs and barges, while also providing additional sea space for deep draft traffic. The remaining blocks were all located within 5 NM of the demonstrated shipping routes, so there were no areas identified as Green. Most of the remaining blocks had high conflict with existing routes, but were designated as Yellow to allow them to be further evaluated for consideration for wind energy development.

Appendix VII

Applications of the Red – Yellow – Green Methodology

The official R-Y-G Determination for VA was completed in September 2011and is attached as Enclosure 5. Figure 24 is the resulting area that was advertised in the BOEM Call for Information and Nominations for VA.

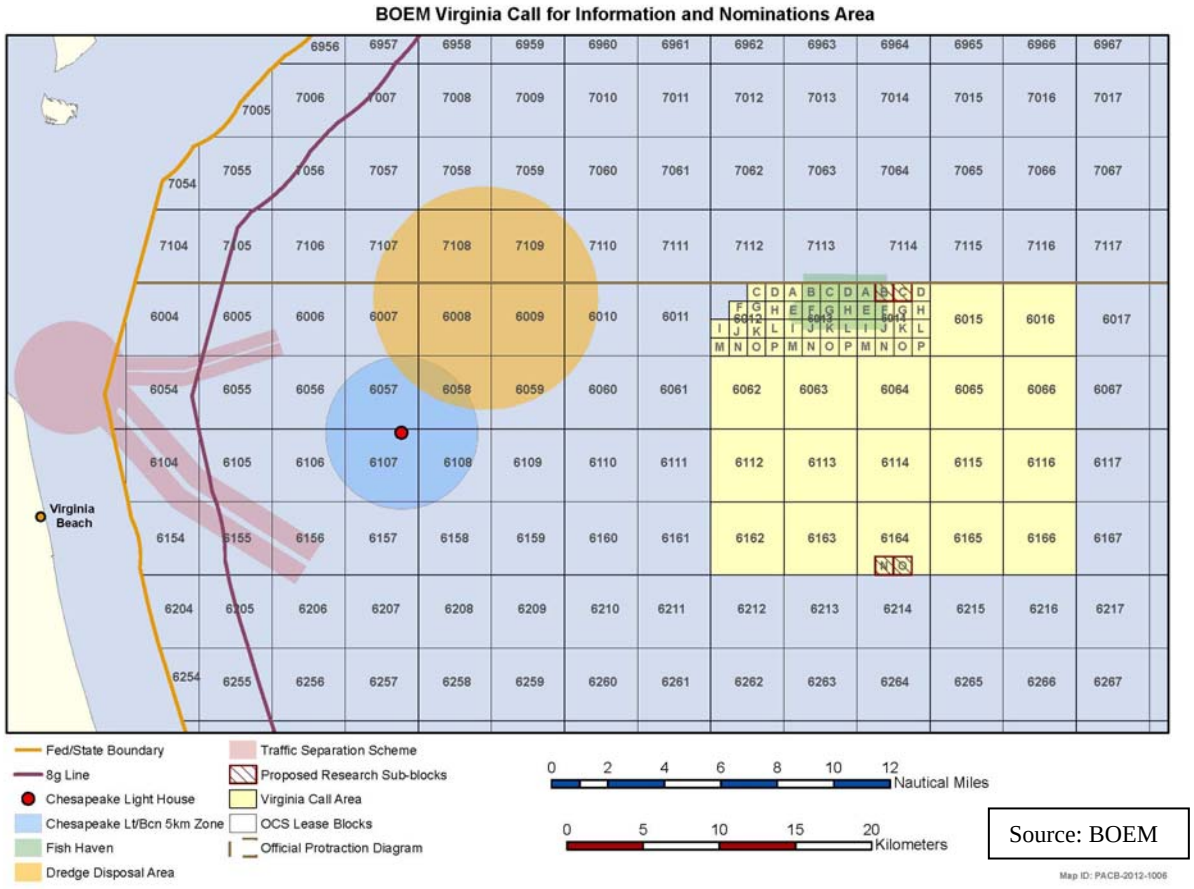


Figure 24 - Virginia Call Area[34]

[34] Source: BOEM.

Appendix VII

Applications of the Red – Yellow – Green Methodology

R-Y-G Determination for North Carolina (NC).

An initial R-Y-G Determination was completed in September 2011 by the Fifth District Waterways Management Staff for five areas being considered off North Carolina (NC). The classification was made using the Coast Guard produced vessel density plots, printed in large scale on a chart plotter. The classification of the lease blocks and aliquots were determined manually, recorded in tabular form and submitted to BOEM. The submittal is attached as Enclosure 6. BOEM plotted the R-Y-G using GIS software and worked with the Coast Guard to resolve some inconsistencies in the labeling of the blocks and some errant areas incorrectly showing high vessel density. The final R-Y-G determinations displayed in Figures 25, 26 and 27 designate significant amounts of areas of the potential wind energy area as Red, meaning there is high conflict with vessel navigation. At the time of this writing, the NC Call Areas have not been finalized.

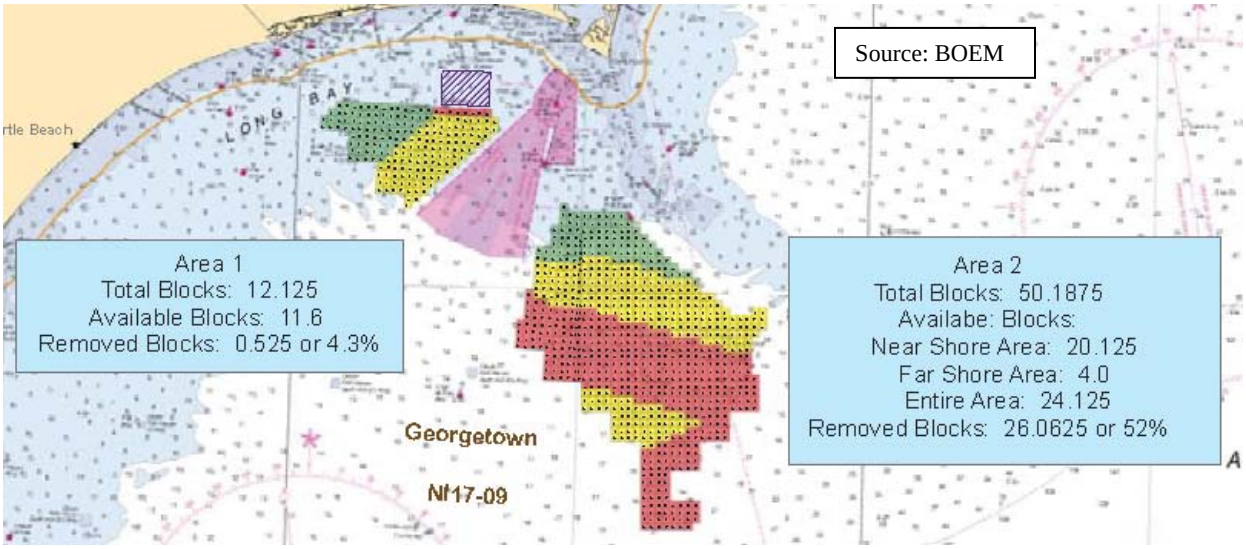


Figure 25 - R-Y-G Determination for NC Areas 1 and 2 (offshore of Cape Fear)[35]

[35] Map was created by BOEM based on the Coast Guard's R-Y-G Determination.

Appendix VII

Applications of the Red – Yellow – Green Methodology

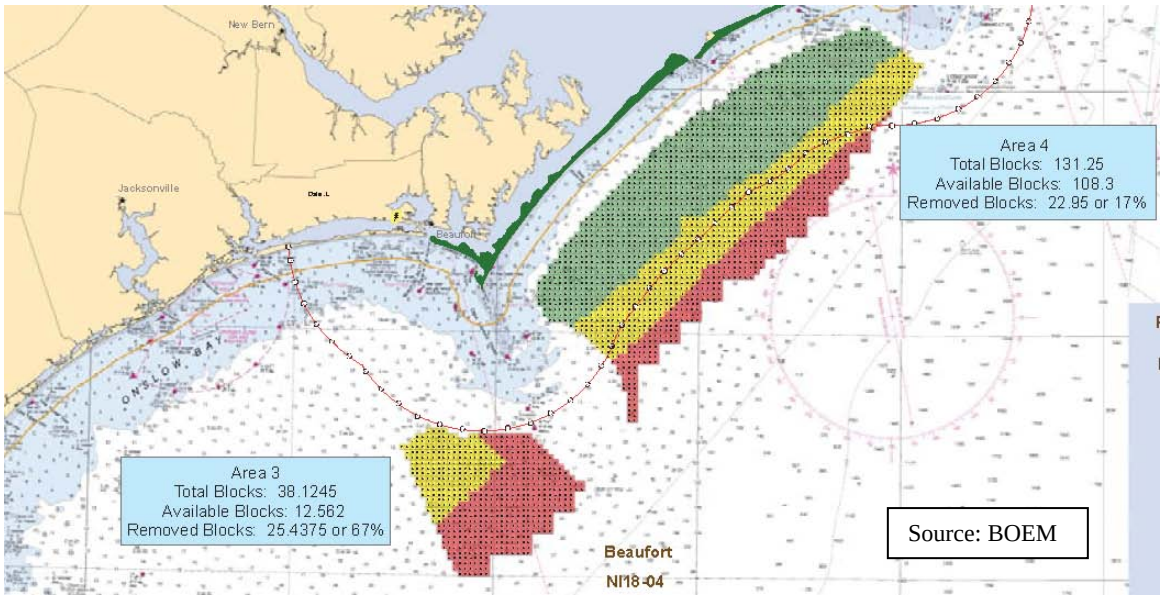


Figure 26 - R-Y-G Determination for NC Areas 3 and 4 (offshore of Cape Lookout)[36]

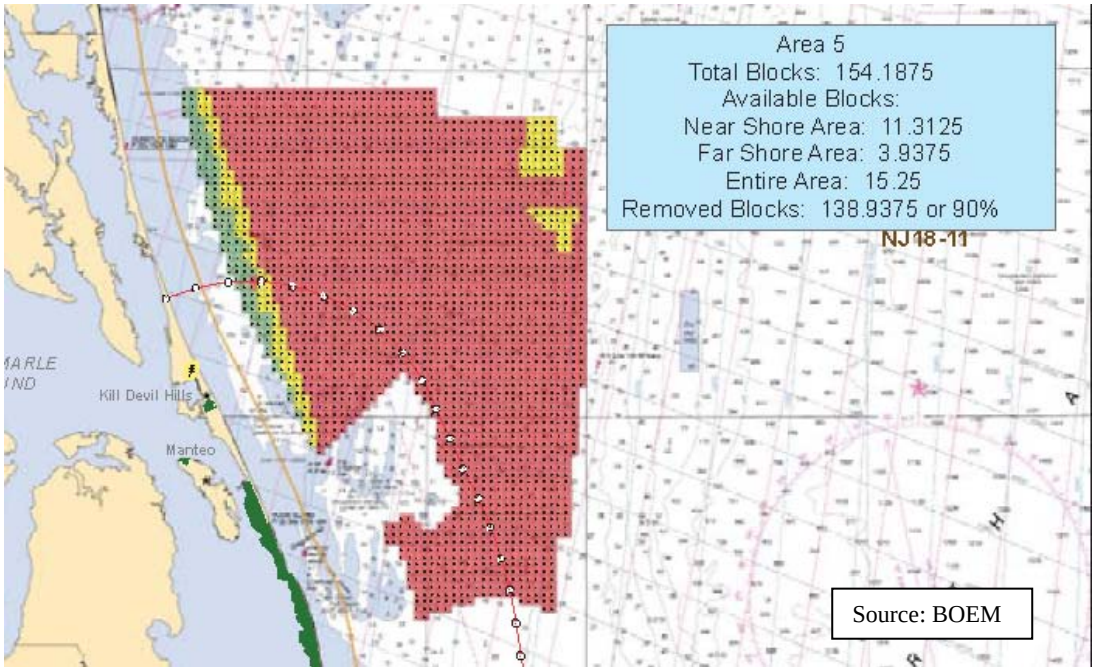


Figure 27 - R-Y-G Determination for NC Area 5 (offshore of Currituck)[37]

[36] Map was created by BOEM based on the Coast Guard's R-Y-G Determination.
[37] Map was created by BOEM based on the Coast Guard's R-Y-G Determination.

Appendix VIII

Preliminary Routing Measures

Although the intent of Phase 3 was to develop a GIS based model to predict changes in traffic patterns and determine the resultant navigational safety risk in order to evaluate options for routing measures, the WG made an attempt to identify preliminary recommendations for routing measures. The WG reached out to NOAA for assistance with displaying AIS data for the entire study area. NOAA hosted the WG at their Silver Springs offices to assist with exploring the creation of preliminary recommendations for routing measures.

In order to create preliminary recommendations for routing measures the WG explored the possibility of

1) Creating preliminary recommendations for a complete routing system based on AIS data,

2) Creating individual routing measures for specific areas, and

3) Considering the specific routing measures that were recommended in the public comments to the docket.

Given the available AIS data and comments from the public, the WG strove to identify fundamentally apparent routes along the Atlantic Seaboard and into major port areas that were outside of the proposed WEAs. A very broad summary analysis indicates that vessels take roughly the same routes into major port areas, in the current unimpeded environment. Outside of the harbor approach areas, however, vessels take divergent routes depending on destination, type of vessel, safety considerations, and route characteristics, i.e. depth of water, weather and sea state. These factors have ultimately led to many well-traveled, distinct offshore routes.

The WG first attempted to identify the myriad routes, based on AIS, and quickly realized that it would not be possible to capture every traditional route in a routing measure. Instead, the WG (attempted to) locate the centerlines of major shipping/navigation route corridors along the Atlantic Coast. The identified centerlines are depicted by black lines in Figure 28 below.

Appendix VIII

Preliminary Routing Measures

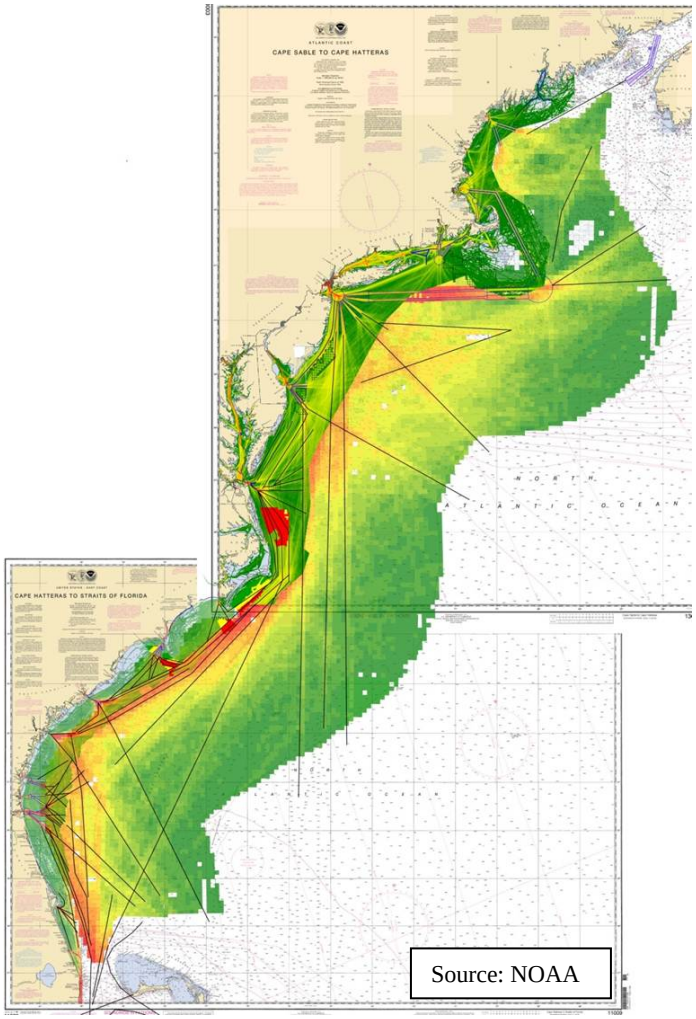


Figure 28 - Atlantic Coast heat map with black lines depicting the center of traditional routes

As the workgroup attempted to pare down the number of routes several questions were raised, such as: How many routes would be needed? Which historical routes should be captured as recommended routing measures? What types of routing measures should be used and what width do the routes need to be? It became readily apparent that as routes were eliminated or combined, the density of vessels would be increased and it would result in the mixing of different types of vessels.

Several recommendations were received in the public comments that would be good to use as guidelines, such as lanes should be larger further offshore when vessels are transiting at higher speeds. There were also several recommendations about the minimum dimensions of routing measures, but the recommendations varied greatly. The IMO Ships' Routing publication gives design criteria, but no rigorous guidelines for determining the size of routing measures have been identified.

Appendix VIII

Preliminary Routing Measures

The WG does not have the capability to evaluate and quantify the impacts to navigational safety without the modeling and analysis described in Phase 3. A conservative approach to designating routing measures would quickly remove most of the wind energy areas already being proposed, which is not in the interest of facilitating other uses. In Figure 29 the black lines representing the center of traffic routes were increased in width to 5 NM (red), 10 NM (yellow) and 20 NM (green) to show how quickly wider lanes could eliminate areas for other uses and in particular prime, near-shore wind energy areas.

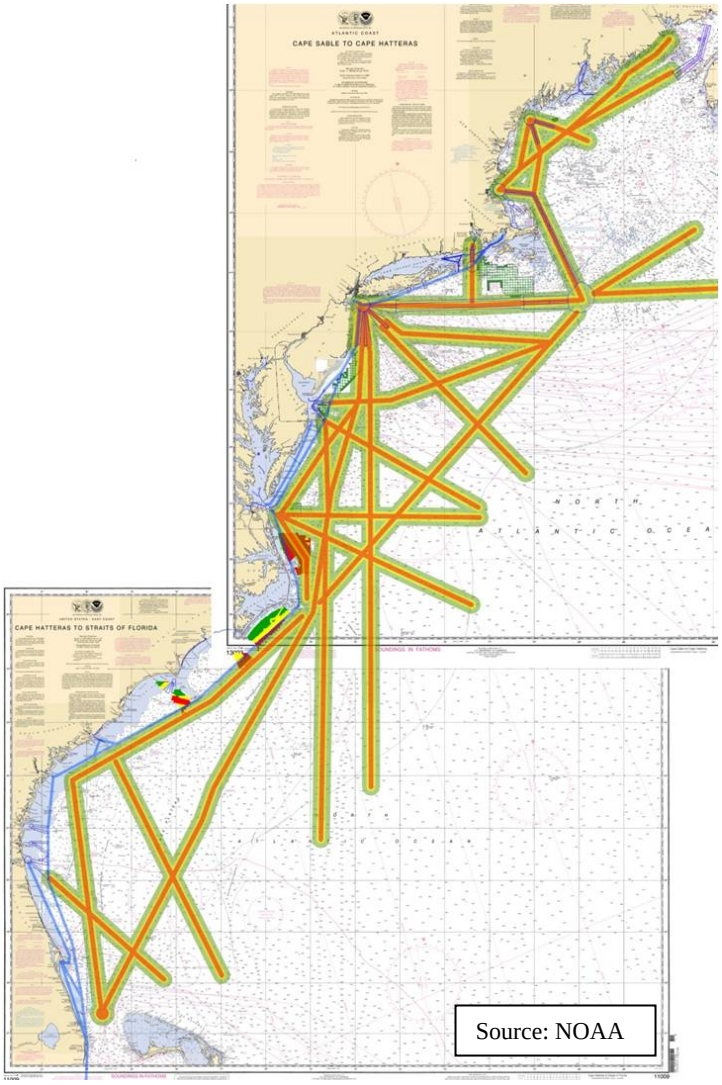


Figure 29 - Atlantic Coast chart depicting theoretical 5, 10 and 20NM lanes over the center of major routes

In every case the WG came to the conclusion that it would be inappropriate to propose even preliminary routes based on incomplete AIS data and the rudimentary evaluation that has been completed to date. The modeling and analysis portions of Phase 3 are necessary to determine if routing measures would be appropriate.

Appendix IX -

Triton Knoll Wind Farm Marine Navigational Safety Risk Assessment[38]

The WG has found that for the Coast Guard to make appropriate recommendations to BOEM with regard to impacts to navigation, a modeling solution must be employed that examines how the dynamics of marine transportation would change in response to a wind installation. The WG surveyed the European markets and looked for guidance from the more mature projects regulators and developers. The science of navigational impact assessments has evolved in Europe to match pace with the advancing OREI environment. The WG agrees that the analytical approach taken in preparing the Marine Navigational Risk Assessment for the Triton Knoll Offshore Wind Farm is an excellent example of a prudent and comprehensive predictive analysis.

In chapter 7 of that report, an extensive analysis of changes in the waterway was undertaken. The philosophy was to utilize modeling that was not a doomsday scenario, but a likely combination of miniature "worst cases" such as narrow spacing between turbines and rotor spans that are on the edge of what is currently practicable. The parameters of the vessels were also reasonable- the encounter analysis is limited to only commercial vessels since it is not expected that recreational vessels or fishing vessels would be prohibited from operating within the proposed wind farm. Using a discrete data set of known users, the modeling was performed allowing a certain buffer of space around each modeled vessel so data could be generated not only for collisions and allisions, but near misses as well. This analysis was performed for the current waterway profile without the wind farm, then with a projected growth of the users of 10%, and then for both cases with the wind farm included as an obstructing factor.

A by-product of this analysis was detailed information about additional steaming times for known journeys to avert OREIs. This sheds light on the overall social impacts that a project will have on known stakeholders, i.e. additional carbon emissions from vessels, potentially higher cost of goods. Encounter modeling can also be utilized to predict the optimum times for construction and maintenance as well as model the likely drift patterns of known vessels should they suffer a complete loss of propulsion in the vicinity of a site. This predictive approach to a navigational risk assessment allows the regulators to better understand what changes in aids to navigation and charting are required to ensure safe navigation. Equally important to an encounter analysis is the effect that a basic array of wind turbines might have on marine radar used in the area. The possibility of misinformation as a result of radar interference in the marine domain is a frightening prospect and may require dramatic changes to the use of aids to navigation and other markings. Above all, a comprehensive view of impacts such as was performed for Triton Knoll, helps explain how all the change elements in the waterway will interact with the elements that remain the same.

[38] https://www.rwe.com/web/cms/mediablob/en/657498/data/658300/1/rwe-innogy/sites/wind-offshore/developing-sites/triton-knoll-offshore-wind-farm/volume-3-technical-annex/blob.pdf

U.S. Department of Homeland Security
United States Coast Guard

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16650

MAY 04 2011

MEMORANDUM

From: B. M. Salerno, VADM, DCO
R. C. Parker, VADM, LANTAREA

Reply to Attn of: Mr. George Detweiler (202) 372-1566

To: Distribution

Subj: ATLANTIC COAST PORT ACCESS ROUTE (ACPARS) STUDY TEAM CHARTER

Ref: (a) Ports and Waterways Safety Act (PWSA)(P.L. 95-474, 33 U.S.C. 1223(c))

1. Purpose: To charter the Atlantic Coast Port Access Route Study (ACPARS) team and identify its objectives, membership, and responsibilities.

2. Background: The Bureau of Ocean Energy Management Regulation and Enforcement (BOEMRE) has preliminarily identified numerous locations on the Atlantic continental shelf for potential development of wind energy. These proposed locations have the potential to impact maritime traffic along the entire Atlantic coast. The Deputy Commandant for Operations (DCO) and Commander, Atlantic Area have determined that a Port Access Route Study (PARS) for the entire Atlantic Coast should be performed to examine the impact of the proposals on vessel traffic and help balance the multiple uses of these waters. A study of this magnitude will far exceed the scope of a typical port access route study that focuses on a single port and its associated routes. Commander, Atlantic Area is leading this effort which will be executed by the matrix team described in this charter.

3. Objectives: Using enclosure (1) as a guide, the team will conduct the ACPARS within the limits of available resources to:

a. Determine whether the Coast Guard should initiate actions to modify or create safety fairways, Traffic Separation Schemes or other routing measures;

b. Provide data, tools and/or methodology to assist in future determinations of waterway suitability for proposed projects; and

c. In the near term, develop AIS products and provide other support as necessary to assist Districts with all emerging coastal and offshore energy projects.

4. Membership:

a. LANTAREA (09) - Chair workgroup

b. CG-55 – Co-Chair and Headquarters coordination

c. CG-761- Provide technical assistance and AIS support.

d. D1 (dp)

Enclosure (1)

e. D5 (dp)

f. D7 (dp)

5. Action: The organizational elements identified above shall place a high priority on the ACPARS effort to ensure objectives are met.

6. Meetings: The ACPARS workgroup will meet as scheduled by the workgroup Chair. However, the Chair shall maximize the use of e-mail, online collaboration and teleconferences to achieve the required objectives. The Chair may identify and invite subject matter experts, visiting observers, and advisors to participate in the workgroup.

7. Funding: CG-55 will fund travel and meeting support for the workgroup and articulate additional funding requirements for conducting the study to DCO.

8. Deliverables:

a. Weekly briefings to LANTAREA (09) and CG-55

b. Monthly progress updates to DCO by the last Friday of the month.

c. Publish a Notice of Study by 15 May 2011.

d. Provide AIS products to the Fifth and First Districts for existing Wind Energy Areas by 31 May 2011.

e. Submit final ACPARS report by 01 May 2012.

#

Encl: Atlantic Coast PARS White Paper

Distribution: LANTAREA (00), (09), (P), (3P), CG-5, CG-6, CG-7, CG-094, CGD1, CGD5, CGD7

Red/Yellow/Green Methodology

Background: BOEMRE is releasing "Calls for Interest" and "Requests for Interest" for identified Wind Energy Areas (WEAs) throughout the mid-Atlantic and New England regions of the First and Fifth Coast Guard Districts and has requested that the USCG designate which WEA lease blocks and aliquots are not acceptable for placement of OREIs due to navigational safety issues. This methodology has evolved and was initially tested in the Maryland WEA. The request is for the USCG to designate the blocks as Red, Yellow, or Green, using the best available information, with the understanding that a complete navigational risk study will still need to be completed before a final determination can be made. To meet BOEMRE's request the USCG created a Red/Yellow/Green Sub Group of the ACPARS Workgroup to develop definitions and define the process for categorizing the blocks.

Definitions: The following are recommended definitions developed by the R/Y/G Sub Group and agreed upon by the larger ACPARS Workgroup:

RED BLOCKS: Those blocks, or portions of blocks, that cannot / should not be developed now or in the future because of vessel traffic usage. Development of these blocks would have an unacceptable impact to navigational safety and precludes development. Traffic usage may also increase in these blocks based on the development of adjoining / adjacent blocks.

YELLOW BLOCKS: Those blocks, or portions of blocks, that require further study / analysis of existing traffic usage / patterns as well as projected future traffic increases based on development of adjoining / adjacent blocks. Development of these blocks would potentially have an unacceptable impact on navigational safety which requires additional study to determine the risk and possible mitigation if developed.

GREEN BLOCKS: Those blocks, or portions of blocks, whose development would, based on available information, pose minimal to no detrimental impact to navigational safety. Traffic using these blocks can be "re-routed" around developed alternative energy sites. These blocks would require minimal, if any, mitigation.

Process: A process was developed to assign R/Y/G designation to blocks based on AIS and any other available data on maritime traffic patterns (VMS, AMVER, etc); experience and expertise of CG waterways management professionals; and application of concepts from the United Kingdom Maritime Guidance Note MGN 371 (guidance for determining risk levels based on proposed OREI distances from shipping routes), and senior CG leadership review.

Assumptions:

- The process may be modified over time as better information or processes become available to the Workgroup.

- MGN 371 domains have been derived from a statistical study of ship domains based on radar simulator performance, and traffic surveys in the North Sea, but it is recognized that larger, high speed, HAZMAT and passenger carrying vessels may have larger domains.

- No new mitigation measures are considered in the acceptable distances. (Existing TSS, Fairways, pilotage, and anchorage areas are considered.)

- Impacts due to cumulative effects of WEAs, changes in shipping routes or changes in traffic density, were not considered in the acceptable distances.

MGN 371 provides three break points that were thought to be most significant and useful to this determination:

1NM - The minimum distance to the parallel boundary of a TSS. At this distance there would still be S band radar interference and ARPA is affected. This is also the boundary between High/Medium risk.

2NM – The distance where compliance with COLREGS becomes less challenging, mitigation measures would still be required to reduce risk As Low As Reasonably Practicable (ALARP). This is also the boundary between Medium/Low risk.

5 NM –The distance where there are minimal impacts to navigational safety and risk should be acceptable without additional mitigation. This is also the boundary between Low/Very Low risk.

There was consensus among the R/Y/G sub-group and the larger ACPARS Workgroup to use 5NM as the minimum distance from shipping routes for Green Blocks. There was significant debate between using 1NM and 2NM for the minimum distance from shipping routes for Yellow Blocks. Here is a summary of the Pros and Cons.

1NM:

- Pros:
    - Leaves the largest area for continued study and analysis for OREI placement.
    - Does not remove Blocks that may, after the ACPARS is complete, be determined to be compatible with navigation.
    - Until the final BOEMRE approval of the Construction and Operations Plan, there will be opportunities to remove blocks that are determined by the Study to pose an unacceptable risk.
    - A credible minimum based on a tested standard, that, at this point in the regulatory process, balances navigational safety and the desire to support the exploration of OREI opportunities by limiting the amount red area designated at this juncture.

- Cons:
    - This falls in the Medium to High Risk category based on MGN 371
    - Radar/ARPA interference remains a concern and compliance with COLREGs is challenging.
    - Starting at 1NM may make it more challenging to increase the distance from shipping routes at a later date, knowing this is strong possibility.
    - Accepts a higher level of risk.

2NM:

- Pros:
    - Reduces the risk imposed by interference to shipboard radar and ARPA from wind farms in a sea area where many different vessel types run on different routes that have many crossing points.
    - Affords mariner with sufficient sea room to make compliance with COLREGS "less challenging".
    - Puts risk in the "Low" category as used in the UK Maritime Guidance.
    - Reduces the likelihood of increasing the distance from shipping routes later in the process.
- Cons:
    - If, based on the completed ACPARS, it is later determined that 2NM was not necessary, this limits the present opportunities for OREI development.

Recommendation: Although consensus was not reached, the majority of the ACPARS Workgroup recommended the use of a 1NM separation distance from shipping routes for determining the boundary between Yellow and Red Blocks. As stated above there was consensus for using 5NM as the minimum distance from shipping routes for Green Blocks. The following is the agreed upon process for designating the color of the blocks:

1) Identify existing vessel routing/management measures, i.e. TSSs, fairways, anchorages and - designate all areas within 1NM as Red

2) Using seasoned CG waterway management professionals, approximate and bound commercial shipping routes outside of TSS/fairways using best available AIS data; however, a minimum of 1 year of data is recommended. Designate all areas within 1 NM as Red

3) Designate the areas from 1NM - 5 NM from any shipping route, TSS or Fairway as Yellow.

4) Other areas where there appears to be significant traffic, but not a clearly defined route- designate Yellow

5) Outside of 5NM from any commercial shipping route, TSS or Fairway and does not appear to have significant traffic – designate Green.

6) If, on completion of steps 1 to 5, the remaining WEA does not contain a sufficient number of Yellow or Green connected blocks to make the WEA viable for commercial development (viability will be based on recommendations from BOEMRE and state task forces). Should this be the case, consider one or more of the following potential measures to reduce the areas designated as Red:

   - Identifying Red blocks that if made Yellow may reroute some traffic, but without significant impacts;
   - Modifying existing Fairways (or TSS); or,
   - Establishing new Fairways, TSSs or other routes.

   If these measures would decrease the number of Red areas, record the modifications as part of the CG record and color previously Red blocks (or aliquots) as Yellow.

7) Conduct review of R/Y/G recommended designations by the larger ACPARS workgroup.

8) Present recommendations to ACPARS Guidance Team, CG-55, LANT-09, and the cognizant District Commander for review.

Excerpt from MGN 371

WIND FARM: "SHIPPING ROUTE" Template

Distance in miles (nm) of Turbine Boundary from Shipping Route	Factors	Risk	Tolerability
< 0.25nm (500m)	500m inter-turbine spacing = small craft only recommended	VERY HIGH	INTOLERABLE
0.25nm (500m)	X band radar interference	VERY HIGH	
0.45nm (800m)	Vessels may generate multiple echoes on shore based radars	VERY HIGH	
			TOLERABLE IF ALARP (As Low As Reasonably Practicable)*
0.5nm (926m)	Mariners' high traffic density domain	HIGH	
0.8nm (1481m)	Mariners' ship domain	HIGH	
1 nm (1852m)	Minimum distance to parallel boundary of TSS	MEDIUM	
1.5nm (2778m)	S band radar interference ARPA affected	MEDIUM	
2 nm (3704m)	Compliance with COLREGS becomes less challenging	MEDIUM	
>2nm > (3704m)	But not near TSS	LOW	
3.5nm (6482m)	Minimum separation distance between turbines opposite sides of a route	LOW	
			BROADLY ACCEPTABLE
5nm (9260m)	Adjacent wind farm introduces cumulative effect Distance from TSS entry/exit	VERY LOW	
10nm (18520m)	No other wind farms	VERY LOW	

* Descriptions of ALARP can be found in a) Great Britain Health and Safety Executive (2001) Reducing risks protecting people b) IMO (2002) MSC Circ 1023 dated 5th April 2002 Formal Safety Assessment c) IMO (2007) MSC 83-21-INF2 Consolidated guidelines for Formal Safety Assessment

Enclosure (2)

DESIGNATED RED/YELLOW/GREEN BLOCKS FOR THE MARYLAND WIND ENERGY AREA BY THE US COAST GUARD
10 June 2011

Background: BOEMRE is looking to release a Call For Interest (CFI) for the Maryland Wind Energy Area (MD WEA) and has requested that the USCG designate which MD WEA blocks are not acceptable for placement of an OREI due to navigational safety issues. The request is for the USCG to identify the blocks as Red, Yellow, or Green, using the best available information, with the understanding that a complete navigational risk study will still need to be completed before a final analysis and recommendation can be made. To meet BOEMRE's request, the USCG created a Red/Yellow/Green (R/Y/G) Sub Group of the Atlantic Coast Port Access Route Study (ACPARS) Workgroup to develop definitions and define the process for categorizing the blocks.

DEFINITIONS:

Red Blocks: Those blocks, or portions of blocks, that cannot / should not be developed now or in the future because of the existing, and possible future increase in, vessel traffic density. Development of these blocks would have an unacceptable impact on navigational safety that precludes development. Traffic usage may increase in these blocks based on the development of adjoining / adjacent blocks.

Yellow Blocks: Those blocks, or portions of blocks, that require further study / analysis of existing traffic usage / patterns as well as projected future traffic increases based on development of adjoining / adjacent blocks. Development of these blocks would potentially have an unacceptable impact on navigational safety which requires additional study to determine the risk and identification of possible mitigations if developed.

Green Blocks: Those blocks, or portions of blocks whose development, based on available information, would pose minimal to no detrimental impact on navigational safety. Traffic using these blocks can be "re-routed" around developed alternative energy sites. These blocks are subject to additional study to determine if their development will have any impact to navigational safety. At present, the USCG has minimal concern with these blocks being developed. .

Process: A process was developed to assign R/Y/G designation to blocks based on:

- A review of available information including AIS data and user input;
- A review of existing traffic patterns;
- A review of the existing literature;
- A consideration of the opinions and advice of Coast Guard Subject Matter Experts (SME) on waterways management and the ACPARS Workgroup,
- The application of concepts from the United Kingdom Maritime Guidance Note MGN 371 (guidance for determining risk levels based on proposed OREI distances from shipping routes), and
- Senior Coast Guard leadership review.

COLOR DESIGNATION OF BLOCKS (OR PORTIONS OF BLOCKS)

The following blocks are RED:

BLOCK #	PORTIONS OF BLOCKS (ALIQUOTS)
6629	ALL
6679	ALL
6729	ALL
6779	ALL
6829	ALL
6628	ALL
6678	ALL
6728	ALL
6778	ALL
6828	A, B, C, D, E, F, G, H, I, J, K, L, N, O, P
6627	ALL
6677	ALL
6727	ALL
6777	A, B, C, D, F, G, H, K, L, O, P
6827	D
6626	ALL
6676	A, B, C, D, E, F, G, H, I, J, K, L, N, O, P
6726	C, D, G, H, L,
6625	A, B, C, D, F, G, H, J, K, L, O, P
6675	D,

The following blocks are YELLOW:

6828	M
6777	E, I, J, M, N
6827	A, B, C, E, F, G, H, I, J, K, L, M, N, O, P
6676	M
6726	A, B, E, F, I, J, K, M, N, O, P
6776	ALL
6826	ALL
6625	E, I, M, N
6675	A, B, C, E, F, G, H, I, J, K, L, M, N, O, P
6725	ALL
6775	ALL
6825	ALL
6624	ALL
6674	A, B, C, D, E, F, G, H, J, K, L, O, P
6724	C, D, G, H, K, L, O, P
6774	C, D, G, H, K, L, O, P
6623	C, D, G, H, K, L, P

The following blocks are GREEN:

6674	I, M, N
6724	A, B, E, F, I, J, M, N
6774	A, B, E, F, I, J, M, N
6623	O
6673	C, D, G, H, K, L, O, P
6723	C, D, G, H, K, L, O, P
6773	C, D, G, H

Based on the above:

Red Blocks are not to be considered for development because of the identification of significant adverse impact on navigational safety of vessels engaged in coastwise and international transits to or from ports and places subject to the jurisdiction of the United States. These blocks are not negotiable for inclusion in the CFI.

The Coast Guard advises that Yellow and Green Blocks may be included in the CFI, but the blocks require further study to determine what, if any, risk exists and possible mitigations if particular Yellow and Green Blocks are developed, or whether they must be removed and not be available for development.

The USCG requests that the following language be included in BOEMRE's Federal Register Notice announcing the CFI for Maryland:

Navigational Issues

The U.S. Coast Guard (USCG) has a responsibility to ensure the safety of navigation under the Ports and Waterways Safety Act (PWSA). The PWSA requires the USCG to provide safe access routes for the movement of vessel traffic proceeding to or from ports or places subject to the jurisdiction of the United States. This is accomplished through designation of necessary fairways and traffic separation schemes (TSS) for vessels operating in the territorial sea of the United States and in high sea approaches, outside the territorial sea. The USCG may also determine that establishment of other ships' routing measures would enhance navigational safety, and it works with its federal interagency and International Maritime Organization partners to establish these voluntary measures as necessary.

The potential for navigational safety risk posed by building structures in proximity to shipping routes is affected by numerous factors including, but not limited to: vessel size, vessel type, density of traffic, prevailing conditions, cumulative impact of multiple obstructions (i.e. wind facilities), existence of multiple shipping routes (i.e. crossing or meeting situations), radar/automatic radar plotting aid (ARPA) interference, and existence of mitigating factors such as navigational aids, vessel traffic services, or pilotage.

Currently, there is no standard recommended separation distance between offshore renewable energy facilities and shipping routes. The USCG has reviewed guidance published by other countries such as the United Kingdom's Maritime Guidance Note MGN-371 and consulted with its own waterways subject matter experts. Currently, the USCG considers that the placement of wind facilities in any area less than 1 nautical mile (nm) from traditional shipping routes poses a high risk to navigational safety and therefore does not recommend placement of offshore renewable energy facilities in such areas. The USCG considers placement of wind facilities in areas greater than 5 nm from existing shipping routes to pose minimal risk to navigational safety from a siting consultation perspective. Areas considered for development of wind facilities between 1 nm and 5 nm would require additional USCG analysis to determine if mitigation factors could be applied to bring navigational safety risk to within acceptable levels. Please note that impacts to radar and ARPA still occur outside of 1 nm and will have to be evaluated along with other potential impacts. The above are only planning

guidelines and may be further modified upon completion of a Navigational Safety Risk Assessment (NSRA) and the Atlantic Coast Port Access Route Study (ACPARS) described in the following paragraph before BOEMRE approves construction of any offshore renewable energy facilities.

The USCG is conducting an ACPARS to determine how best to route traffic on the Atlantic coast. (See *Federal Register* 76 FR 27288; May 11, 2011). This study will better inform the USCG about the navigational safety risks, if any, associated with construction of offshore renewable energy facilities. The data gathered during this ACPARS may result in establishing new vessel routing measures, modification of existing routing measures, or removal of some existing routing measures off the Atlantic Coast from Maine to Florida.

The USCG advises that the following blocks or portions of blocks may be included in the Call for Information and Nominations/Request for Interest and considered for possible leasing and potential development. However, these blocks require further study to determine what, if any, risk exists, and to determine if USCG should recommend to BOEMRE to remove these blocks from consideration for leasing and potential development, or to develop potential mitigations if these blocks are made available for development.

6828	M
6777	E, I, J, M, N
6827	A, B, C, E, F, G, H, I, J, K, L, M, N, O, P
6676	M
6726	A, B, E, F, I, J, K, M, N, O, P
6776	ALL
6826	ALL
6625	E, I, M, N
6675	A, B, C, E, F, G, H, I, J, K, L, M, N, O, P
6725	ALL
6775	ALL
6825	ALL
6624	ALL
6674	ALL
6724	ALL
6774	ALL
6623	C, D, G, H, K, L, O, P
6673	C, D, G, H, K, L, O, P
6723	C, D, G, H, K, L, O, P
6773	C, D, G, H

DESIGNATED RED/YELLOW/GREEN BLOCKS FOR THE RHODE ISLAND WIND ENERGY AREA OF MUTUAL INTEREST

Background: Rhode Island Wind Energy Area of Mutual Interest (RI WEA); BOEMRE has requested that the USCG designate which RI WEA blocks are not acceptable for placement of an OREI due to navigational safety issues. The request is for the USCG to identify the blocks as Red, Yellow, or Green, using the best available information, with the understanding that a complete navigational risk study will still need to be completed before a final analysis and recommendation can be made. To meet BOEMRE's request, the USCG created a Red/Yellow/Green (R/Y/G) Sub Group of the Atlantic Coast Port Access Route Study (ACPARS) Workgroup to develop definitions and define the process for categorizing the blocks.

DEFINITIONS:

Red Blocks: Those blocks, or portions of blocks, that cannot / should not be developed now or in the future because of the existing, and possible future increase in, vessel traffic density. Development of these blocks would have an unacceptable impact on navigational safety that precludes development. Traffic usage may increase in these blocks based on the development of adjoining / adjacent blocks.

Yellow Blocks: Those blocks, or portions of blocks, that require further study / analysis of existing traffic usage / patterns as well as projected future traffic increases based on development of adjoining / adjacent blocks. Development of these blocks would potentially have an unacceptable impact on navigational safety which requires additional study to determine the risk and identification of possible mitigations if developed.

Green Blocks: Those blocks, or portions of blocks whose development, based on available information, would pose minimal to no detrimental impact on navigational safety. Traffic using these blocks can be "re-routed" around developed alternative energy sites. These blocks are subject to additional study to determine if their development will have any impact to navigational safety. At present, the USCG has minimal concern with these blocks being developed. .

Process: A process was developed to assign R/Y/G designation to blocks based on:

- A review of available information including AIS data and user input;
- A review of existing traffic patterns;
- A review of the existing literature;
- A consideration of the opinions and advice of Coast Guard Subject Matter Experts (SME) on waterways management and the ACPARS Workgroup,
- The application of concepts from the United Kingdom Maritime Guidance Note MGN 371 (guidance for determining risk levels based on proposed OREI distances from shipping routes), and
- Senior Coast Guard leadership review.

COLOR DESIGNATION OF BLOCKS (OR PORTIONS OF BLOCKS)

The following blocks are RED:

BLOCK #	PORTIONS OF BLOCKS (ALIQUOTS)
6764	C, D, F, G, H, I, J, K, L, M, N, O, P
6765	ALL
6766	A, B, C, D, E, F, G, H, I, J, K, M, N
6814	ALL
6815	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O
6816	A, E
6864	ALL
6865	A, B, E, I
6914	A, B, C, E, F, I, J, M, N
6964	A, B, E, F, I, J, M, N
7014	A, B, E, F, I, M
7063	ALL
6663	ALL
6664	ALL
6713	ALL
6714	ALL

The following blocks are YELLOW:

BLOCK #	PORTIONS OF BLOCKS (ALIQUOTS)
6764	A, B, E
6766	L, O, P
6815	P
6816	B, C, D, F, G, H, I, J, K, L, M, N, O, P
6817	A, B, C, D, E, F, G, H, I, J, K, M, N
6865	C, D, F, G, H, J, K, L, M, N, O, P
6866	ALL
6867	A, B, E, I
6914	D, G, H, K, L, O, P
6915	ALL
6916	A, B, C, E, F, I, M
6964	C, D, G, H, K, L, O, P
6965	ALL
6966	A, E, I, M
7014	C, D, G, H, J, K, L, N, O, P
7015	ALL
7016	A, E, I
7064	ALL
7065	ALL
7066	A, B, E, F, G, H, I, J, K, L, M, N, O, P
7067	I, J, M, N, O, P
7068	ALL
7069	ALL

7070	ALL
7071	ALL
7114	ALL
7115	ALL
7116	ALL
7117	ALL

The following blocks are GREEN:

BLOCK #	PORTIONS OF BLOCKS (ALIQUOTS)
6817	L, O, P
6867	C, D, F, G, H, J, K, L, M, N, O, P
6916	D, G, H, J, K, L, N, O, P
6917	ALL
6918	ALL
6919	ALL
6966	B, C, D, F, G, H, J, K, L, N, O, P
6967	ALL
6968	ALL
6969	ALL
6970	ALL
6971	ALL
7016	B, C, D, F, G, H, J, K, L, M, N, O, P
7017	ALL
7018	ALL
7019	ALL
7020	ALL
7021	ALL
7066	C, D
7067	A, B, C, D, E, F, G, H, K, L,

Based on the above:

Red Blocks are not to be considered for development because of the identification of significant adverse impact on navigational safety of vessels engaged in coastwise and international transits to or from ports and places subject to the jurisdiction of the United States. These blocks are not negotiable for inclusion in the CFI.

Yellow Blocks require further study to determine what, if any, risk exists and possible mitigations if a particular Yellow Block is developed, or whether they must be removed and not be available for development.

The USCG requests that the following language be included in BOEMRE's Federal Register Notice if/when announcing the CFI for Rhode Island:

"The Coast Guard has a responsibility to ensure the safety of navigation under the Ports and Waterways Safety Act. The navigational safety risk posed by building structures in the proximity

of shipping will be affected by numerous factors including but not limited to: vessel size, vessel type, density of traffic, prevailing conditions, cumulative impacts of multiple obstructions (wind farms), existence of multiple shipping routes (crossing or meeting situations), radar/ARPA interference, and existence of mitigating factors such as navigational aids, vessel traffic services, pilotage, etc.

There currently is no standard recommended separation distance between OREIs and shipping routes. As an interim measure, the Coast Guard intends to apply the UK Maritime Guidance Note MGN-371 and the expertise of waterways SME's to evaluate and/or identify individual BOEMRE RFIs/CFIs. Based on MGN-371, any areas <1 NM from existing shipping routes pose a high risk to navigational safety and are not considered acceptable for the placement OREIs. Areas >5NM from existing shipping routes are considered to pose minimal risk to navigational safety. Everything between 1NM and 5NM would require analysis to determine if mitigation factors could be applied to bring navigational safety risk to within acceptable levels. Please note that impacts to radar and ARPA still occur outside of 1 NM which will have to be evaluated along with other potential impacts. The above are only planning guidelines and a full navigational risk assessment will be required as part of the EIS prior to approving construction of any OREIs."

DESIGNATED RED/YELLOW/GREEN BLOCKS FOR THE VIRGINIA WIND ENERGY AREA BY THE US COAST GUARD
26 September 2011

Background: BOEMRE is anticipating release of a Call for Information and Nominations (Call)(CFI) for the Virginia Wind Energy Area (VA WEA) and has requested that the USCG designate which VA WEA blocks are not acceptable for placement of an OREI due to navigational safety issues. The request is for the USCG to identify the blocks as Red, Yellow or Green, using the best available information, with the understanding that a complete navigational risk study will still need to be completed before a final analysis and recommendation can be made. To meet BOEMRE's request, the USCG created a Red/Yellow/Green (R/Y/G) Sub Group of the Atlantic Coast Port Access Route Study (ACPARS) Workgroup to develop definitions and define the process for categorizing the blocks.

DEFINITIONS:

Red Blocks: Those blocks, or portions of blocks, that cannot / should not be developed now or in the future because of the existing, and possible future increase in, vessel traffic density. Development of these blocks would have an unacceptable impact on navigational safety that precludes development. Traffic usage may increase in these blocks based on the development of adjoining / adjacent blocks.

Yellow Blocks: Those blocks, or portions of blocks, that require further study / analysis of existing traffic usage / patterns as well as projected future traffic increases based on development of adjoining / adjacent blocks. Development of these blocks would potentially have an unacceptable impact on navigational safety which requires additional study to determine the risk and identification of possible mitigations if developed.

Green Blocks: Those blocks, or portions of blocks whose development, based on available information, would pose minimal to no detrimental impact on navigational safety. Traffic using these blocks can be "re-routed" around developed alternative energy sites. These blocks are subject to additional study to determine if their development will have any impact to navigational safety. At present, the USCG has minimal concern with these blocks being developed. .

PROCESS:

A standard process was developed to assign R/Y/G designation to blocks based on:

- A review of available information including AIS data and user input;
- A review of existing traffic patterns;
- A review of the existing literature;
- A consideration of the opinions and advice of Coast Guard Subject Matter Experts (SME) on waterways management and the ACPARS Workgroup;
- The application of concepts from the United Kingdom Maritime Guidance Note MGN 371 (guidance for determining risk levels based on proposed OREI distances from shipping routes);
- A consideration of possible modifications to or possible establishment of routing measures in the vicinity of the WEA, and
- Senior Coast Guard leadership review.

In addition to the above process, the Coast Guard reviewed comments provided to date in response to its Atlantic Coast Port Access Route Study (ACPARS) and those comments provided to BOEMRE in response to its Draft Environmental Assessment (EA). Further, the Coast Guard considered existing charted hydrographic information and features, including the proximity of the Norfolk Ocean Disposal Site and the Navy's Shipboard Electronic Systems Evaluation Facility (SESEF).

Based on the above:

Red Blocks are not to be considered for development because of the identification of significant adverse impact on navigational safety of vessels engaged in coastwise and international transits to or from ports and places subject to the jurisdiction of the United States. These blocks are not negotiable for inclusion in the CFI.

COLOR DESIGNATION OF BLOCKS (OR PORTIONS OF BLOCKS)

In reviewing the available AIS data, the initial assessment concluded that very little of the proposed area would be suitable for development without significant new vessel routing measures imposed on large numbers and various types of the commercial shipping vessels that trade at ports throughout the Chesapeake Bay watershed. Acknowledging that there are proposals for rerouting of traffic and a broad base of support from local/state government and industry organizations to develop a workable solution, the Coast Guard has refrained from designating most of the blocks (and aliquots) as Red while the Coast Guard conducts further study and analysis. However, the Coast Guard has determined the following blocks designated as RED would not be suitable for development under any of the foreseeable options for creating routing measures.

The following blocks are RED:

BLOCK #	PORTIONS OF BLOCKS (ALIQUOTS)
6011	ALL
6012	A, B, E
6061	ALL
6110	ALL
6111	ALL
6160	ALL
6161	ALL

The USCG advises that the following blocks or portions of blocks may be included in the Call for Information and Nominations/Request for Interest and considered for possible leasing and potential development. The Coast Guard cautions, however, that much or all of the blocks now designated as Yellow, may become unacceptable after its ACPARS is concluded and a deliberate evaluation of vessel routing measures, and possible modifications of the USN Danger Zone, are fully evaluated and characterized. Final determination of the suitability of the designated Yellow blocks cannot be determined until a complete analysis is completed. The designation of Yellow blocks was divided into two categories to distinguish between those blocks that would be Yellow based on existing shipping routes and those that the Coast Guard believes would require new routing measures to enable development.

The following blocks are YELLOW:

BLOCK #	PORTIONS OF BLOCKS (ALIQUOTS)
6012	D, H, K, L, O, P
6013	A, B, C, D, E, F, G, H, I, J, K, L, M
6014	A, B, C, E, F
6116	O, P
6165	C, D, E, F, G, H
6166	A, B, C, D, E, F, G, H

The following blocks are YELLOW but conflict with existing shipping routes and would require multiple routing measures to be created:

6012	C, F, G, I, J, M, N,
6013	O, P
6014	D, G, H, I, J, K, L, M, N, O, P
6015	ALL
6016	ALL
6062	ALL
6063	ALL
6063	ALL
6065	ALL
6066	ALL
6112	ALL
6113	ALL
6114	ALL
6115	ALL
6116	A, B, C, D, E, F, G, H, I, J, K, L, M, N
6162	ALL
6163	ALL
6164	ALL
6165	A, B, I, J, K, L, M, N, O, P
6166	I, J, K, L, M, N, O, P

There are no GREEN blocks identified for the VA WEA.

The USCG requests that the following language be included in BOEMRE's Federal Register Notice announcing the CFI for Virginia:

Navigational Issues

The U.S. Coast Guard (USCG) has a responsibility to ensure the safety of navigation under the Ports and Waterways Safety Act (PWSA). The PWSA requires the USCG to provide safe access routes for the movement of vessel traffic proceeding to or from ports or places subject to the jurisdiction of the United States. This is accomplished through designation of necessary fairways and traffic separation schemes (TSS) for vessels operating in the territorial sea of the United States and in high sea approaches, outside the territorial sea. The USCG may also determine that establishment of other ships' routing measures would enhance navigational safety, and it works with its federal interagency and International Maritime Organization partners to establish these voluntary measures as necessary.

The potential for navigational safety risk posed by building structures in proximity to shipping routes is affected by numerous factors including, but not limited to: vessel size, vessel type, density of traffic, prevailing conditions, cumulative impact of multiple obstructions (i.e. wind facilities), existence of multiple shipping routes (i.e. crossing or meeting situations), radar/automatic radar plotting aid (ARPA) interference, and existence of mitigating factors such as navigational aids, vessel traffic services, or pilotage.

Currently, there is no standard recommended separation distance between offshore renewable energy facilities and shipping routes. The USCG has reviewed guidance published by other countries such as the United Kingdom's Maritime Guidance Note MGN-371 and consulted with its own waterways subject matter experts. Currently, the USCG considers that the placement of wind facilities in any area less than 1 nautical

mile (nm) from traditional shipping routes poses a high risk to navigational safety and therefore does not recommend placement of offshore renewable energy facilities in such areas. The USCG considers placement of wind facilities in areas greater than 5 nm from existing shipping routes to pose minimal risk to navigational safety from a siting consultation perspective. Areas considered for development of wind facilities between 1 nm and 5 nm would require additional USCG analysis to determine if mitigation factors could be applied to bring navigational safety risk to within acceptable levels. Please note that impacts to radar and ARPA still occur outside of 1 nm and will have to be evaluated along with other potential impacts. The above are only planning guidelines and may be further modified upon completion of a Navigational Safety Risk Assessment (NSRA) and the Atlantic Coast Port Access Route Study (ACPARS) described in the following paragraph before BOEMRE approves construction of any offshore renewable energy facilities.

The USCG is conducting an ACPARS to determine how best to route traffic on the Atlantic coast. (See *Federal Register* 76 FR 27288; May 11, 2011). This study will better inform the USCG about the navigational safety risks, if any, associated with construction of offshore renewable energy facilities. The data gathered during this ACPARS may result in establishing new vessel routing measures, modification of existing routing measures, or removal of some existing routing measures off the Atlantic Coast from Maine to Florida.

The USCG advises that most of blocks and aliquots included in the Call and considered for possible leasing and potential development would require creation of significant new routing measures. The Coast Guard cautions that many or all of the blocks now included in the Call, may become unacceptable after its Atlantic Coast Port Access Routes Study (ACPARS) is concluded and a deliberate evaluation of vessel routing measures, and possible modifications of the USN Danger Zone, are fully evaluated and characterized. Final determination of the suitability of the Call area cannot be determined until a complete analysis is completed.

DESIGNATED RED/YELLOW/GREEN BLOCKS FOR THE NORTH CAROLINA AREAS PROPOSED FOR DEVELOPMENT OF WIND ENERGYBY THE US COAST GUARD
4 November 2011

Background: BOEM is anticipating release of a Public Information Request and a Call for Information and Nominations (Call)(CFI) for the areas being proposed for the development of wind energy in North Carolina (NC) and has requested that the USCG designate which NC blocks are not acceptable for placement of an OREI due to navigational safety issues. The request is for the USCG to identify the blocks as Red, Yellow or Green, using the best available information, with the understanding that a complete navigational risk study will still need to be completed before a final analysis and recommendation can be made. To meet BOEM's request, the USCG created a Red/Yellow/Green (R/Y/G) Sub Group of the Atlantic Coast Port Access Route Study (ACPARS) Workgroup to develop definitions and define the process for categorizing the blocks.

DEFINITIONS:

Red Blocks: Those blocks, or portions of blocks, that cannot / should not be developed now or in the future because of the existing, and possible future increase in, vessel traffic density. Development of these blocks would have an unacceptable impact on navigational safety that precludes development. Traffic usage may increase in these blocks based on the development of adjoining / adjacent blocks.

Yellow Blocks: Those blocks, or portions of blocks, that require further study / analysis of existing traffic usage / patterns as well as projected future traffic increases based on development of adjoining / adjacent blocks. Development of these blocks would potentially have an unacceptable impact on navigational safety which requires additional study to determine the risk and identification of possible mitigations if developed.

Green Blocks: Those blocks, or portions of blocks whose development, based on available information, would pose minimal to no detrimental impact on navigational safety. Traffic using these blocks can be "re-routed" around developed alternative energy sites. These blocks are subject to additional study to determine if their development will have any impact to navigational safety. At present, the USCG has minimal concern with these blocks being developed. .

PROCESS:

A standard process was developed to assign R/Y/G designation to blocks based on:

- A review of available information including AIS data and user input;
- A review of existing traffic patterns;
- A review of the existing literature;
- A consideration of the opinions and advice of Coast Guard Subject Matter Experts (SME) on waterways management and the ACPARS Workgroup;
- The application of concepts from the United Kingdom Maritime Guidance Note MGN 371 (guidance for determining risk levels based on proposed OREI distances from shipping routes);
- A consideration of possible modifications to or possible establishment of routing measures in the vicinity of the WEA, and
- Senior Coast Guard leadership review.

In addition to the above process, the Coast Guard reviewed comments provided to date in response to its Atlantic Coast Port Access Route Study (ACPARS). Further, the Coast Guard considered existing charted hydrographic information and features. The Coast Guard also considered the proposed location of a planned Anchorage Ground located on the northern border of area 1. The proposed purposes of the

anchorage grounds are: explosives, quarantine and general use. The final delineation/identification of the perspective uses and rules of use will be determined in accordance with the requirements of the Administrative Procedures Act. The Coast Guard recommends that the potential uses of the anchorage ground be clearly identified in the CFI. Current plans call for the anchorage ground to occupy approximate lease blocks 6184, 6185 6186.

Based on the above:

Blocks and aliquots have been assessed as either red, green or yellow for areas one through five and as listed in the attachment. Red Blocks are not to be considered for development because of the identification of significant adverse impact on navigational safety of vessels engaged in coastwise and international transits to or from ports and places subject to the jurisdiction of the United States. These blocks are not negotiable for inclusion in the CFI.

The USCG advises that the yellow and green blocks or portions of blocks may be included in the Call for Information and Nominations/Request for Interest and considered for possible leasing and potential development. However, the yellow blocks require further study to determine what, if any, risk exists and possible mitigations if they are developed, or whether BOEM should remove them and not make them available for development.

Final determination of the suitability of the designated Yellow blocks cannot be determined until a complete analysis is completed.

The USCG requests that the following language be included in BOEMRE's Federal Register Notice announcing the CFI for Virginia:

Navigational Issues

The U.S. Coast Guard (USCG) has a responsibility to ensure the safety of navigation under the Ports and Waterways Safety Act (PWSA). The PWSA requires the USCG to provide safe access routes for the movement of vessel traffic proceeding to or from ports or places subject to the jurisdiction of the United States. This is accomplished through designation of necessary fairways and traffic separation schemes (TSS) for vessels operating in the territorial sea of the United States and in high sea approaches, outside the territorial sea. The USCG may also determine that establishment of other ships' routing measures would enhance navigational safety, and it works with its federal interagency and International Maritime Organization partners to establish these voluntary measures as necessary.

The potential for navigational safety risk posed by building structures in proximity to shipping routes is affected by numerous factors including, but not limited to: vessel size, vessel type, density of traffic, prevailing conditions, cumulative impact of multiple obstructions (i.e. wind facilities), existence of multiple shipping routes (i.e. crossing or meeting situations), radar/automatic radar plotting aid (ARPA) interference, and existence of mitigating factors such as navigational aids, vessel traffic services, or pilotage.

Currently, there is no standard recommended separation distance between offshore renewable energy facilities and shipping routes. The USCG has reviewed guidance published by other countries such as the United Kingdom's Maritime Guidance Note MGN-371 and consulted with its own waterways subject matter experts. Currently, the USCG considers that the placement of wind facilities in any area less than 1 nautical mile (nm) from traditional shipping routes exposes a high risk to navigational safety and therefore does not recommend placement of offshore renewable energy facilities in such areas. The USCG considers

placement of wind facilities in areas greater than 5 nm from existing shipping routes to pose minimal risk to navigational safety from a siting consultation perspective. Areas considered for development of wind facilities between 1 nm and 5 nm would require additional USCG analysis to determine if mitigation factors could be applied to bring navigational safety risk to within acceptable levels. Please note that impacts to radar and ARPA still occur outside of 1 nm and will have to be evaluated along with other potential impacts. The above are only planning guidelines and may be further modified upon completion of a Navigational Safety Risk Assessment (NSRA) and the Atlantic Coast Port Access Route Study (ACPARS) described in the following paragraph before BOEMRE approves construction of any offshore renewable energy facilities.

The USCG is conducting an ACPARS to determine how best to route traffic on the Atlantic coast. (See *Federal Register* 76 FR 27288; May 11, 2011). This study will better inform the USCG about the navigational safety risks, if any, associated with construction of offshore renewable energy facilities. The data gathered during this ACPARS may result in establishing new vessel routing measures, modification of existing routing measures, or removal of some existing routing measures off the Atlantic Coast from Maine to Florida.

The Coast Guard cautions that many or all of the blocks now included in the Call, may become unacceptable after its Atlantic Coast Port Access Routes Study (ACPARS) is concluded and navigational safety risks are fully evaluated and characterized. Final determination of the suitability of the Call area cannot be determined until a complete analysis is completed.

RYG FOR NORTH CAROLINA VERSION #2
18 JAN 2012
DRAFT

PROTRACTION NAME	RISK	PROTRACTION NUMBER	BLOCK NUMBER	ALIQUOTS
WEA1				
GEORGETOWN	RED	NI17-09	6233	D
			6234	A B C D
			6235	A, B, C
	YELLOW	NI17-09	6233	H K L N O P
			6234	E F G H I J K L M N O P
			6235	E F G H I J K L M N O
			6282	H K L N O P
			6283	ALL
			6284	A B C D E F G H I J K L M N O
			6285	A B E
			6332	ALL
			6333	A B C D E F G H I J K L M N O
			6334	A B E
			6383	A B E
	GREEN	NI17-09	6230	C D F G H I J K L M N O P
			6231	ALL
			6232	ALL
			6233	A B C E F G I J M
			6281	ALL
			6282	A B C D E F G I J M

Enclosure (6)

WEA2				
GEORGETOWN	RED	NI17-09	6537	B F G H J K L N O P
			6587	ALL
			6538	E F I J K L M N O P
			6539	I M (SLIVER)
			6588	ALL
			6589	ALL (SLIVER)
			6638	ALL
			6639	ALL (SLIVER)
	YELLOW	NI17-09	6487	C D G H K L O P
			6488	ALL
			6438	I J K L M N O P
			6539	A E (SLIVER)
			6537	C D
			6538	A B C D E G H
			6489	ALL (SLIVER)
	GREEN	NI17-09	6388	B F G H J K L M N O P
			6389	ALL (SLIVER)
			6437	K L O P
			6438	A B C D E F G H
WEA2				
CAPE FEAR	RED	NI18-07	6501	L P (SLIVER)
			6502	I J M N O P
			6503	M
			6551	ALL (SLIVER)
			6552	ALL
			6553	ALL
			6601	ALL (SLIVER)
			6602	ALL
			6603	ALL
			6604	ALL
			6605	ALL
			6606	ALL
			6607	A B C E F G I J K M N O P
			6554	A E F G H I J K L M N O P
			6555	I J K L M N O P
			6556	M N O
			6652	A B C D
			6653	A B C D E F G H L
			6654	A B C D E F G H I J K L P
			6655	ALL
			6656	ALL
			6657	ALL
			6705	C D K L M N O P
			6706	ALL
			6754	C D E F G H I J K L M N O P
			6755	ALL
			6804	ALL

			6854	ALL
			6855	A B C D E F G H I J K L M N O
WEA2				
CAPE FEAR	YELLOW	NI18-07	6401	ALL (SLIVER)
			6402	M N O P
			6451	ALL (SLIVER)
			6452	ALL
			6453	ALL
			6454	E F G I J K L M N O P
			6455	I J K M N O P
			6501	D H (SLIVER)
			6502	A B C D E F G H K L
			6503	A B C D E F G H I J K L N O P
			6504	ALL
			6505	ALL
			6506	A B E F G I J K L M N O P
			6507	L M N O P
			6508	I M
			6554	B C D
			6555	A B C D E F G H
			6556	A B C D E F G H I J K L P
			6557	A B C D E F G H I J K M N O
			6558	A
			6652	E F G H I J K L M N O P
			6653	I J K M N O P
			6654	M N O
			6703	ALL
			6704	ALL
			6705	A B C E F G H I J
			6754	AB
WEA2				
CAPE FEAR	GREEN	NI18-07	6351	ALL (SLIVER)
			6352	E F G H I J K L M N O P
			6353	E F G M N O P
			6402	A B C D E F G H I J K L
			6403	ALL
			6404	A E F I J K L M N O P
			6454	A B C D H
			6455	A E F G

WEA3				
BEAUFORT	RED	NI18-04	6779	G H L
			6780	E F G H I J K L M N O P
`			6781	E F G H I J K L M N O P
			6782	I M N
			6830	B C D G H L O P
			6831	ALL
			6832	A B C E F G H I J K L M N O P
			6833	I M N
			6879	L O P
			6880	ALL
			6881	ALL
			6882	ALL
			6883	A B C E F G H I J K L M N O P
			6884	I J M N
			6928	K L N O P
			6929	ALL
			6930	ALL
			6931	ALL
			6932	ALL
			6933	ALL
			6977	H K L O P
			6978	ALL
			6980	ALL
			6981	ALL
			6982	ALL
			7027	D H L
			7028	ALL
			7029	ALL
			7030	ALL
			7031	ALL
			7078	A B C D F G H J K L O P
			7079	ALL
BEAUFORT	YELLOW	NI18-04	6775	P
			6776	G H J K L M N O P
			6777	ALL
			6778	E F I J K L M N O P
			6779	E F I J K M N O P
			6826	A B C D E F G H J K L N O P
			6827	ALL
			6828	ALL
			6829	ALL
			6830	A E F I J K M N
			6876	B C D G H K L P
			6877	ALL
			6878	ALL
			6879	A B C D E F G H I J K M N
			6926	D
			6927	ALL
			6928	A B C D E F G I J M

			6977	B C D F G
WEA4				
BEAUFORT	RED	NI18-04	6488	D G H J K L M N O P
			6537	D G H J K L M N O P
			6538	ALL
			6585	P
			6586	D G H I J K L M N O P
			6587	ALL
			6636	A B C D E F G H J K L N O P
			6686	B C D G H K L O P
			6736	C D G H K L
BEAUFORT	YELLOW	NI18-04	6338	D G H J K L M N O P
			6387	C D F G H I J K L M N O P
			6388	ALL
			6435	L O P
			6436	C D E F G H I J K L M N O P
			6437	ALL
			6438	ALL
			6484	L N O P
			6485	B C D E F G H I J K L M N O P
			6486	ALL
			6487	ALL
			6488	A B C E F I
			6534	A B C D E F G H K L P
			6535	ALL
			6536	ALL
			6537	A B C E F I
			6585	A B C D F G H K L
			6586	A B E F
BEAUFORT	GREEN	NI18-04	6087	P
			6088	D F G H I J K L M N O P
			6136	P
			6137	C D F G H I J K L M N O P
			6138	ALL
			6185	P
			6186	C D F G H I J K L M N O P
			6187	ALL
			6188	ALL
			6234	P
			6235	C D F G H I J K L M N O P
			6236	ALL
			6237	ALL
			6238	ALL
			6284	C D F G H J K L M N O P
			6285	ALL
			6286	ALL
			6287	ALL
			6288	ALL
			6333	D G H J K L N O P
			6334	ALL

			6335	ALL
			6336	ALL
			6337	A B C D E F G H I J K L M N O
			6338	A B C E F I
			6382	H L O P
			6383	ALL
			6384	ALL
			6385	ALL
			6386	ALL
			6387	A B E
			6432	B C D F G H J K L N O P
			6433	ALL
			6434	ALL
			6435	A B C D E F G H I J K M N
			6482	B C D G H K L P
			6483	ALL
			6484	A B C D E F G H I J K M
			6485	A
			6533	D
WEA4				
RUSSELL	RED	NI18-05	6352	D F G H I J K L M N O P
			6401	D G H J K L M N O P
			6402	ALL
			6451	ALL
			6303	D G H J K L M N O P
			6353	ALL
			6254	G H J K L M N O P
			6304	ALL
			6354	A B C D E F G H I J K M N
			6205	H K L M N O P
			6255	ALL
			6305	A B C D E F G H I J K L M N
			6156	H K L N O P
			6206	ALL
			6256	ALL
			6107	L O P
			6157	ALL
			6207	ALL
			6058	L O P
			6108	B C D E F G H I J K L M N O P
			6158	A B C D E F G I J M
			6059	C D F G H I J K L M N O P
			6010	D G J M
RUSSELL	YELLOW	NI18-05	6007	L N O P
			6008	ALL
			6009	ALL
			6010	A B C E F I
			6056	H K L N O P
			6057	ALL
			6058	A B C D E F G H I J K M N

			6059	A B E
			6105	D G H J K L M N O P
			6106	ALL
			6107	A B C D E F G H I J K M N
			6108	A
			6153	K L N O P
			6154	B C D E F G H I J K L M N O P
			6155	ALL
			6156	A B C D E F G I J M
			6202	H K L N O P
			6203	B C D E F G H I J K L M N O P
			6204	ALL
			6205	A B C D E F G I J
			6251	ALL
			6252	ALL
			6253	ALL
			6254	A B C D E F I
			6301	ALL
			6302	ALL
			6303	A B C E F I
			6351	ALL
			6352	A B C E
			6401	A B C E F I
RUSSELL	GREEN	NI18-05	6001	D G H J K L M N O P
			6002	ALL
			6003	ALL
			6004	ALL
			6005	ALL
			6006	A LL
			6007	A B C D E F G H I J K M
			6051	ALL
			6052	ALL
			6053	ALL
			6054	ALL
			6055	ALL
			6056	A B C D E F G I J M
			6101	ALL
			6102	ALL
			6103	ALL
			6104	ALL
			6105	A B C E F I
			6151	ALL
			6152	ALL
			6153	A B C D E F G H I J M
			6201	ALL
			6202	A B C D E F G I J M
			6203	A
WEA4				
MANTEO	YELLOW		7108	H K L M N O P
			7059	K L N O P

			7109	ALL
			7010	L N O P
			7060	B C D E F G H I J K L M N O P
			7110	ALL
			7011	F G I J K L M N O P
			7061	ALL
			7111	A B C E F I
			7012	M N
			7062	A E
MANTEO	GREEN	NI18-02	7102	O P
			7103	C D F G H I J K L M N O P
			7053	P
			7054	D F G H I J K L M N O P
			7104	ALL
			7005	L N O P
			7055	ALL
			7105	ALL
			7006	D F G H I J K L M N O P
			7056	ALL
			7106	ALL
			7107	ALL
			6957	O P
			7007	ALL
			7057	ALL
			6958	H J K L M N O P
			7008	ALL
			7058	ALL
			7108	A B C D E F G I J
			6959	C D E F G H I J K L M N O P
			7009	ALL
			7059	A B C D E F G H I J M
			6960	E F I J K M N O P
			7010	A B C D E F G H I J K M
			7060	A
			7011	A B E

WEA5				
CURRITUCK SND	YELLOW	NJ18-11	6669	ALL
			6718	D H L P
			6719	ALL
			6720	A E I M
			6819	A B C D F G H K L
			6820	A B C E F G I J M N
			6870	A B E F
			6608	A E F I J M N
			6658	B C F G K O
			6708	C D H L P
			6709	M
			6758	D H L P
			6759	A E F I J M N
			6809	B C F G J K N O
			6859	C D H K L P
			6910	A E F I J M N
			6960	A B E F G K O
			7010	C D G H K L O P
			7011	M
			7060	D H
			7061	A E I J M N
			7111	B F G J K O
CURRITUCK SND	GREEN	NJ8-11	6607	C D G H K L O P
			6657	D H L P
			6658	A E I J M N
			6708	A B E F G I J K M N O
			6758	B C F G J K N O
			6808	C D G H K L P
			6809	A E I M
			6858	D H
			6859	A B E F G I J M N O
			6909	A B C D F G J K O P
			6959	C D G H L P
			6960	I J M N
			7010	A B E F J M N
			7060	C G L
			7111	A E N
			7161	C D G H L P
CURRITUCK SND	RED	NJ18-11		ALL REMAINING BLOCKS
MANTEO	RED	NJ18-11		ALL REMAINING BLOCKS