Environmental Studies Program: Ongoing Study

Title	Risk Assessment to Model Encounter Rates Between Large Whales and Vessel Traffic from Offshore Wind Energy – PHASE II (AT-23-03)
Administered by	Office of Renewable Energy Programs
BOEM Contact(s)	Kyle Baker (kyle.baker@boem.gov)
Procurement Type(s)	Contract
Conducting Organization(s)	Continental Shelf Associates, Inc.
Total BOEM Cost	$599,981.85
Performance Period	FY 2023–2024
Final Report Due	August 2025
Date Revised	August 21, 2023
PICOC Summary	
Problem	The National Oceanic and Atmospheric Administration (NOAA) has identified increases in vessel traffic as a significant threat to the recovery of North Atlantic right whales and other large whales. BOEM must have a rigorous analysis tool to evaluate risk to whales from offshore vessel activity that supports wind development. The Phase I calculator needs further development to conduct updates and expand the geographic utility of the calculator.
Intervention	Using the existing calculator (version 1, AT 19-01), conduct peer review and expert elicitation on calculator improvements, interpretation of calculator results, and conduct trainings on calculator use to targeted user groups.
Comparison	The risk from vessels supporting offshore wind will be put into context of increases in project-specific vessel traffic increases, as well as comparison to overall vessel traffic.
Outcome	Phase II will result in an improved calculator based on expert review and elicitation, and train industry, contractors, National Environmental Policy Act (NEPA) practitioners, NOAA, and BOEM personnel on its use to support consistent application of scientifically rigorous results.
Context	National

BOEM Information Need(s): The approval of offshore wind projects involves an assessment of the environmental risks, including any potential impacts to wildlife. BOEM prepares environmental impact analyses (Environmental Impact Statements, Environmental Assessments, and Biological Assessments) for renewable energy projects throughout the U.S. Atlantic Outer Continental Shelf (OCS). Improved assessment tools would support these analyses to assess project-level, regional, and cumulative impact analyses for Atlantic renewable energy activities.

Background: The effects of vessel operations on large whales and sea turtles has been identified as an important impact on the conservation and recovery of these species. Vessel strike is an identified source of injury and mortality affecting population of large whales and sea turtles. The reported number of annual vessels strikes with whales and sea turtles in the U.S. Atlantic is believed to represent a small

percentage of the actual lethal and non-lethal strikes that may be occurring. BOEM funded development of version 1 of the calculator (AT 19-01) (Barkaszi et al. 2021) to primarily assess the risk of vessel interactions between wind energy areas on the Atlantic OCS with protected species of marine mammals and sea turtles. Calculator updates, expansion of the calculator to meet BOEM needs nationally, increased capabilities to translate the calculator outputs for use in environmental assessments are the primary objectives of Phase II of the calculator development. to improved assessment tools are needed to better evaluate the spatial and temporal risks from these vessel operations. Phase II will include additional development to assess the influence of both vessel and animal aversions related to vessel strikes. Additionally, the model would be expanded to include emerging wind development areas (WDAs) outside of the Atlantic OCS, such as the Gulf of Mexico, U.S. west coast, and Hawaii. Results of continued development will be able to produce a comprehensive and robust examination of the potential impact to the marine environment in the form of an industry-standard vessel strike risk assessment modelling tool. Encounter rates between vessels and protected species may depend on a number of species-specific parameters, as well as factors including the location of ports, transit areas, the size of vessels, vessel numbers, geographic region, time of year, etc. There is a high level of industry interest in a model that can provide a risk assessment tool for vessel risks that uses appropriately applied animal and vessel aversion. Phase II (this study) will conduct a comprehensive analysis of vessel operations and develop the necessary improvements and training materials to train users that would allow BOEM and stakeholders to adequately evaluate the relative risks of OCS vessel operations.

New density estimates planned to be published by Duke University, regional densities for other species, and the BOEM-identified need of transforming the probabilities of encounters into a risk framework, and an essential need to train user groups in the operation of the calculator is required. Calculator improvement through expert elicitation and review or via meetings or a workshop will be required. Coordination with NEPA practitioners, federal endangered species biologists, and developers will also be required to identify training needs under Phase II of the calculator development.

Objectives: The objective of this study is to improve the calculations, interpretation of results, and assessment of risk to protected species from vessel strikes related to offshore wind development by 1) providing a tool for a more robust analysis of aversion behaviors of large whale and sea turtle species relative to different classes of vessels traveling at different speeds; 2) conducting a literature compilation to inform model inputs; 3) convening workshops with subject matter experts to validate model inputs; and 4) incorporation of new WDAs and OCS areas along the U.S. east and west coasts, Gulf of Mexico, and Hawaii, and 5) produce improved outputs and expanded ARC GIS-based calculator with the ability to customize user-defined scenarios, and a risk assessment framework to translate calculator outputs for use in environmental assessments.

Methods: This project will include a literature compilation, expert elicitation through meetings and/or workshops, and a desktop study to improve and expand the capabilities of the Phase I calculator. risk assessment associated with vessel operations in the offshore renewable energy in the Atlantic, focusing on existing and potential future development areas of both leased and unleased wind energy areas. The study will be conducted in five stages:

1. Conduct a literature compilation of marine mammal and sea turtle density and behavioral information.
2. Conduct an elicitation of subject matter experts through meetings and/or a workshop to review the available information and identify species-specific or group-specific calculator parameters.
3. Identify the needs of users including BOEM, NOAA, the offshore wind industry, and

environmental assessment experts. This needs assessment will also include the development of a risk assessment framework based on the probabilities produced by the calculator. Calculator outputs will be refined as needed, based on this assessment.

4. Conduct the calculator improvements.
5. Develop training materials and conduct trainings to targeted user groups.

Specific Research Question(s):

1. How can regional sea turtle and marine mammal density estimates be incorporated into the current calculator?
2. How can new Duke density estimates at the 5 km^2 resolution be incorporated into the calculator with other estimates, such as sea turtles or other areas, that may be at a lower spatial resolution?
3. How can the vessel risk calculator be improved through expert elicitation to better address behavioral inputs and scientific and management concerns surrounding vessel strikes?
4. How can the probability of encounter risk be translated into a scale of relative risk to protected species for analysis of risk?
5. How can training best prepare and meet the needs of calculator users (NEPA contractors, NOAA, ENGOs, developers, and BOEM personnel)?

Current Status: The contract was awarded in August, 2023.

Publications Completed: N/A

Affiliated WWW Sites: N/A

References:

Barkaszi MJ, Fonseca M, Foster T, Malhotra A, Olsen K. 2021. Risk assessment to model encounter rates between large whales and vessel traffic from offshore wind energy on the Atlantic OCS. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No.: OCS Study BOEM 2021-034.