Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Comments on the draft PEIS for the NEW YORK BIGHT Offshore Wind Projects by DEFEND BRIGANTINE BEACH AND DOWNBEACH 2/26/24, Docket # BOEM-2024-0001

Deb Haaland, Secretary
U.S. Department of the Interior
1849 C Street, NW
Washington, D.C. 20240
feedback@ios.doi.gov

Elizabeth Klein, Director
Bureau of Ocean Energy Management
1849 C Street, NW
Washington, D.C.20240
elizabeth.klein@boem.gov

Richard Spinrad
Administrator, NOAA
1401 Constitution Ave., NW
Washington, D.C. 20230
Rick.Spinrad@noaa.gov

Janet Coit, Assistant Administrator
National Marine and Fisheries Services
1315 East-West Highway
Silver Spring. MD 20910
Janet.Coit@NOAA.gov,
Alesia.Read@NOAA.gov

Jill Lewandowski
BOEM Office of
Environmental Progams
45600 Woodland Rd, VAM-OEP
Sterling, VA 20166
Jill.lewandowski@boem.gov

Karen J. Baker, Chief
Office of Renewable Energy Programs
Bureau of Ocean Energy Management
45600 Woodland Road
Sterling, VA 20166
Karen.Baker@boem.gov

Dear Agency Manager,

This letter is on behalf of Defend Brigantine Beach Inc. And Downbeach. We represent over 5000 persons and businesses concerned with the New York Bight projects off the coast of New Jersey. We are not opposed to clean energy in general and seek only that where it is pursued, it be done in a reasonable and consistent manner, and not leave major collateral damage in its wake.

According to the Federal Register, BOEM states that the purpose of the Draft PEIS is to analyze the potential impacts of the New York Bight along with identifying possible changes to those impacts that could result from adopting certain avoidance, minimization, mitigation, and monitoring measures (AMMM). After public input, BOEM will decide on whether to adopt one or all of the AMMM measures outlined in the DPEIS and make them conditions of approval for

activities proposed by the lessees in their construction and operation plans (COPS) or defer the decision to adopt such measures to each project-specific environmental review. According to the diagram about the process, the PEIS analyzes the programmatic avoidance, minimization, mitigation, and monitoring measures that could apply to the New York Bight leases and includes a focused, regional cumulative analysis.

On request by the Bureau of Ocean Energy Management (BOEM), we have prepared and are providing the comments on the draft EIS (PEIS) herein.

Relative to our understanding of the criteria in those statures and rules, and other common-sense yardsticks, the proposed project itself is extreme and unreasonable, and the structure of the PEIS itself is not consistent with the recent NEPA rule changes of the Biden Administration.

Beyond that, as explained in detail herein, from an environmental impact and public engagement perspective, the manner in which this program is being implemented is a disgrace and makes a mockery of the NEPA and our other environmental statutes.

The amount of time available to review and comment on the PEIS is insufficient and we are formally requesting an extension of the public comment period by at least 90 days. The PEIS as 1420+ pages with approximately 100 references, 15 appendices and nearly 180 tables, nearly 85 figures and over 160 acronyms and abbreviations. The public meetings where not helpful in explaining any of the details of the content of the PEIS. At the very least, there should have been classroom type seminars to review the contents of the PEIS so that the public has a better understanding of the subject matter.

The failure to disclose the environmental impacts of many key subjects such as audible turbine operating noise at the shore, the failure to present the full impacts of others, the extraordinary effort made to minimize the impact of others though creation of contrived baselines and scoring systems, the failure to address cumulative impacts, e.g., on North Atlantic right whale (NARW or "right whale") migration, , the failure to coordinate and disclose results of other key environmental reviews, e.g., the rulemaking proceeding under the Marine Mammal Protection Act, and the overall level of obfuscation is unprecedented.

The offshore wind projects and lease sales should be paused until the forthcoming Government Accountability Office ("GAO") study on offshore wind development in the North Atlantic Planning Area is publicly released, and federal, state, and local officials and agencies have an opportunity to review the report, public a response and implement recommendations, and there is a comprehensive offshore wind pilot program project in the New York Bight to assess the actual economic and

environmental impacts of pre-construction, construction, operation and maintenance, and decommissioning activities, with independent oversight, and an independent transparent investigation into marine mammal deaths off the NJ and NY coasts since December 2022 concluded with substantial evidence that offshore wind development is not a significant cause.

Many officials have been warning us of the risks of rushing thought the approval and construction of the offshore wind projects. BOEM has approved projects despite repeated warnings from the National Marine Fisheries Service about damage to the environment and fishing industry. NMFS has stated that "we are building the ship while sailing it. " The NJ Department of Environmental Projection Official has stated, " We are learning as we go."

According to Scientists who participated in the National Academies of Sciences, Engineering, and Medicine examination of how constructing offshore wind farms in the Nantucket Shoals region, southeast of Massachusetts, could affect critically endangered North Atlantic right whales, the concluded that there are knowledge gaps in understanding the impact of offshore wind.

> "Few studies have been done to understand hydrodynamics around wind energy turbines, and those that exist focus on European offshore wind farms in the North Sea, where conditions are different from Nantucket Shoals. Large turbines of the size planned for the Nantucket Shoals region have not been built yet in U.S. waters.
>
> Researchers have tried to model the hydrodynamic impacts of turbines, but their results don't always agree with each other. There's a need for more work to compare different types of models with each other, and with actual observations in the ocean, to make sure that they represent key processes like tides, stratification, turbulence and drag correctly.
>
> The most accurate outputs will likely come from using a range of models. Oceanographers might start with models that predict what happens as water moves past a single turbine. These results then would inform models that predict the effects of an entire wind farm. Then results from wind farm-scale models would be incorporated into models that predict regional ocean circulation.
>
> There are also a lot of knowledge gaps on the biology side, including questions about what species of zooplankton are in the Nantucket Shoals region, where they come from and what makes them aggregate into patches that are dense enough for right whales to eat. Right whale feeding in the Nantucket Shoals region isn't well understood, so scientists need more

observations to determine which zooplankton types are targeted by right whales and where and when the whales feed."

The PEIS is another example of BOEM's lack of relevant and rigorous scientific studies to use for the huge scope of these projects. The BOEM reports lack baseline data, overall, from offshore wind development from this region. There is a growing interest and evidence of how ocean sediments and marine mammals are useful to sequester carbon. However, this has not been studied or assessed thoroughly yet and this proposed massive industrialization will cause more harm. The issue of Electromagnetic fields effects has not been scaled. There is a lack of rigorous and relevant research on pile driving impacts on marine mammals, specifically baleen whales, and the response of large whale species to extensive networks of wind turbines.

PEIS Lacking Regional Cumulative Analysis

A major deficiency with this process is that the "regional cumulative analysis" only covers the New York Bight Area but excludes the lease areas next to it including but not limited to leases Ocean Wind 1, 2, Atlantic Shores South and North and Empire Wind 1,2 as well as all the other projects off the east coast. How can this process be considered thorough when the cumulative impacts will be far greater than any suggested by the PEIS? Regarding mitigation measures included in the PEIS, we question how they are barely adequate given that the document ignores the cumulative impact of all offshore wind projects in the NJ/NY area as well as all the projects off the east coast. We also question how the monitoring will be handled, the cost of the monitoring, the labor involved in the monitor and how the monitoring processes will be evaluated. Not all mitigation measures are effective for all species. How does mitigation work when a number of suggested activities are voluntary? Lastly, how can mitigation measures be implemented if data is not available to show what the impacts area?

According to the October 2023 legal filings from Cape May County regarding offshore wind,

NEPA is in large measure, an attempt by Congress to instill in the environmental decision making process a more comprehensive approach so that long-term and cumulative effects of small and unrelated decisions could be recognized, evaluated, and either avoided, mitigated, or accepted as the price to be paid for the major federal action under consideration. (*Nat. Res. Def. Council, Inc. v. Callaway,* 524 F.2d 79, 88 (2d Cir. 1975); C.F.R. § 1508.7.)

The Council on Environmental Quality defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when

added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The United States has set a target of producing 30 Gigawatts (30,000 megawatts) of Offshore Wind by 2030:

> To position the domestic offshore wind industry to meet the 2030 target, DOI's Bureau of Ocean Energy Management . . . plans to advance new lease sales and complete review of at least 16 Construction and Operations Plans (COPs) by 2025, representing more than 19 GW of new clean energy for our nation. . . . Achieving this target also will unlock a pathway to 110 GW by 2050..... (Biden Administration, *Fact Sheet: Biden Administration Jumpstarts Offshore Wind Energy" Projects to Create Jobs* (March 29, 2021), https://www.whitehouse.gov/briefing- room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-windenergy-projects-to-create-jobs/.)

BOEM acknowledged the interrelated and cumulative effects of their offshore wind program in 2007 when they produced a Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf. (Bureau of Ocean Energy Management, United States Department of the Interior, *Guide to the OCS Alternative Energy Final Programmatic Environmental Impact Statement*, https://www.boem.gov/ renewable-energy/guide-ocs-alternative-energy-final-programmaticenvironmental-impact-statement-is.)

Defendants intended this Programmatic Environmental Impact Statement to provide a "baseline analysis that helps to satisfy the requirements of NEPA for offshore renewable energy leasing," because "many wind energy projects will have similar environmental impacts." This Programmatic Environmental Impact Statement does not satisfy NEPA's cumulative impacts requirement today because Defendants have significantly altered and expanded their offshore wind program, rendering the Programmatic Environmental Impact Statement's analysis of cumulative environmental impacts inaccurate and outdated and requiring a supplemental or new Environmental Impact Statement analyzing the current program as it now exists.

The New York Bight PEIS repeats the substantial error in the 2007 PEIS in that it does not include the cumulative impacts of any offshore wind projects off the NJ/NY coast as well as all the projects off of the Atlantic Coast.

The NJ/NY PEIS fails to take a hard look at the cumulative impacts of NY Bight combined with the other offshore wind projects that have been leased and are expected to be constructed nearby and the additional offshore wind energy facilities

that are expected to be built along the Atlantic coastline. BOEM thus fails to analyze the combined impacts of the thousands of proposed offshore wind turbines, covering millions of acres of pristine seabed and open ocean, on the human and natural environment.

By segmenting their offshore wind program and analyzing the environmental impacts of the New York Bight projects in isolation, BOEM unlawfully fails to analyze and consider the cumulative environmental impacts of the other multiple offshore wind projects that BOEM has approved or is considering for approval. BOEM's failure to analyze the cumulative environmental impacts of its offshore wind program, as NEPA requires, is arbitrary, capricious, and not in accordance with law—and should be invalidated and set aside. (U.S.C. § 706.)

The New York Bight covers 488,000 acres in addition to the 423,184 acres of the other offshore wind projects in the NY/NJ area. This is a total of almost a million acres of wind development activity, destruction of our ocean, and marine life. According to BOEM's table D-2, there will be 1103 wind turbines in the New York Bight which will be next to another 713 in contiguous lease areas. That is a total of 1816 wind turbines! There will also be a total of 6,333 miles of export and interarray cables in the ocean for all projects. The cumulative impacts of the New York Bight as well as the other contiguous offshore wind projects will devastate the fishing industry and destroy a sustainable food source. BOEM excluded the amount of fossil fuels and chemicals that will be used by the New York Bight projects but we assume, based on the number of turbines, it will be 55% more than the following numbers for the other NY/NJ projects: coolants 2 million gallons; oils 4 million gallons; diesel fuel 1 million gallons. Including all NY/NJ projects, there will be 36,000 acres of seabed disturbance for export cables and 33,000 acres of disturbance for interarray cables. There will be 827 acres of scour protection and 737 acres of cable hard protection excluding NY Bight since no numbers are provided but we assume the Bight will add 2424 more acres of scour and hard protection in the ocean. There will be over 11 tons of carbon dioxide added to the NJ/NY atmosphere during the construction of the projects. The total number of wind turbines planned along the Atlantic Coast is 3,636 with over 15,000 miles of cabling, 180,000 acres of seabed disturbance, 4,800 acres of scour protection. Many of these statistics for the Atlantic Coast totals EXCLUDE the New York Bight Area! New York Bight Draft Programmatic Environmental Impact Statement - Appendix D (boem.gov)

The disturbance of marine life during the surveying, construction and operation of the NY/NJ projects will be significant. The number of Level B Harassment Takes on the Atlantic Coast during the 2024-25 time period alone totals 249,503 and the number of Level A Injury Takes during the 2024-25 time period totals 761. The total number of Level B takes of endangered species totals 920 and Level A Injury endangered species Takes total 9. This includes IHA Permits for 26 offshore wind

projects from Massachusetts to South Carolina. The total number of Level B Harassment Takes for Atlantic Shores project permits alone will total 10,998 during the time period including 35 takes for endangered species. (See Appendix A). The authorization of this cumulative level of takes is irresponsible and reckless.

The ocean off NJ and NY hots 33 species of whales and dolphins, including endangered species, 5 species of endangered sea turtles, hundreds of species of fish and shore birds along with thousands of other marine animals such as invertebrates. This ocean environment is like no other.

PEIS Lacks Sufficient Information and Mitigation for Noise Impacts

Noise impacts from pre-construction, construction, operations and maintenance and decommissioning will impact marine mammals and other marine life for entire life cycle of the projects in the 6 lease areas. Potential and unknown impacts include noise, electromagnetic fields, navigational safety, changes to benthic and pelagic habitats, behavioral changes in wildlife, alternations to food webs, invasive species concerns, and pollution from increased vessel traffic, heat, and onshore and offshore infrastructure. We are attaching a Report and Congressional Testimony from Dr. Bob Stern of Save LBI as part of our comments to add to our public comment record (see Appendix B). Unless BOEM addresses the issues outlined in his report, EIS will be inaccurate and misleading.

There is a lack of basic research of the impacts of OSW energy development on large whale species in U.S. waters, particularly in the mid-Atlantic region. It is reckless to move forward without the scientific baseline assessments for what harm may or could occur to whales before issuing any permits and authorizations, including IHAs, ITRs, and associated LOAs including the failure to include crucial scientific assessments and consultations as follows:

In a May 2022 letter obtained under the Freedom of Information Act by Bloomberg Law, Dr. Sean Hayes, PhD, Chief of Protected Species, NOAA NEFSC, clearly documents and confirms the NARW's fragile hold on existence. First, the Chief of Protected Species notes that there are less than 350 remaining NARW animals. (Letter from Sean A. Hayes, PhD, Chief of Protected Species, NOAA NEFSC, to Brian R. Hooker, Lead Biologist Bureau of Ocean Energy Management, Office of Renewable Energy Programs, dated May 13, 2022.) Again, we note, the Draft North Atlantic Right Whale and Offshore Wind Strategy states that not one animal can be lost.

In regard to the development phases of offshore wind, Dr. Hayes states in his letter:

"The development of offshore wind poses risks to these species, which is magnified in southern New England waters due to species abundance and distribution. These

risks occur at varying stages, including construction and development, and include increased noise, vessel traffic, habitat modifications, water withdrawals associated with certain sub-stations and resultant impingement/entrainment of zooplankton, changes in fishing effort and related potential increased entanglement risk, and oceanographic changes that may disrupt the distribution, abundance, and availability of typical right whale food (e.g., Dorrell et al 2022)."

It is clear that any further disturbance of the NARW species will have an impact on this critically endangered species. Some scientists estimate that the species will go extinct within 20 years with current threats. (Pennisi, Elizabeth. "The North Atlantic right whole faces extinction." Science, November 7, 2017, https://www.science.org/content/article/north-atlantic-right-whale-faces-extinction.

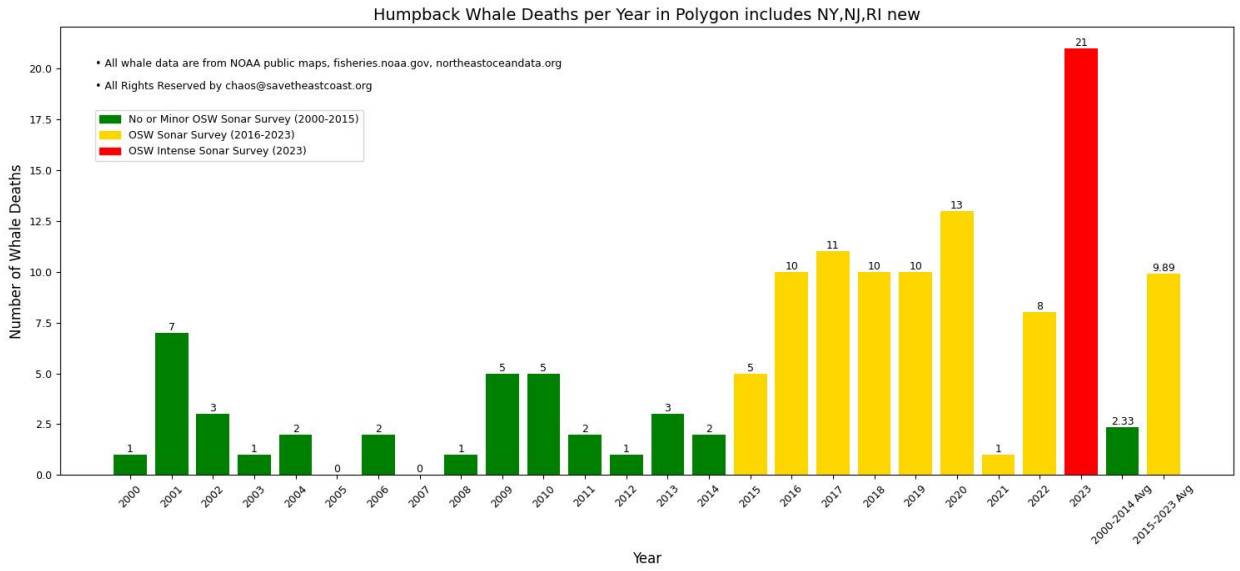
The academic paper in PEIS Appendix J, Introduction to Sound and Acoustic Assessment, bears no resemblance to the six projects in the PEIS. The paper uses two theoretical sites, only 60 turbines each, for a total of 120. This is a tenth of the number of turbines planned for the Bight which is 1103. The turbines in the study are only 6 MW compared to the huge 1300 ft high turbines planned for the NY Bight. This study used in the PEIS has no relevance to the NY Bight projects. The pile driving noise level is for driving a roughly 20-foot diameter pile, which is small by present and future standards. The 13-15 MW turbines use piles that are around 40 ft in diameter. A 20 MW turbine may be as large as a 60 foot diameter. This lack of rigor is an example of BOEM's rushed and reckless push for offshore wind. Any mitigation measures that are suggested for noise in the PEIS, if responding to the irrelevant study, are unacceptable.

According to statistical analysis and independent research by Apostolos Gerasoulis, Professor of Computer Science at Rutgers University, the construction of wind turbines in the New York Bight poses a significant threat to the marine ecosystem, particularly affecting numerous whale and fish species that frequent this area, as reported by Gotham Whales. This includes several endangered species, highlighting the critical nature of the threat. The use of sonar for seabed mapping in the region generates noise levels up to 226 decibels at the source, falling into the low-frequency range (LFI), which is within the hearing range of many whale and dolphin species. Analysis of NOAA data reveals a stronger correlation between the recent surge in whale mortalities and sonar mapping activities than with cargo ship traffic, challenging the notion that increased ship traffic is the primary cause of these deaths.

According to Gerasoulis, statistical evidence further supports this argument. From 2020 to 2021, despite an 18.46% increase in ship traffic, whale deaths astonishingly fell by 92.31%. The following year saw a 25.15% rise in ship traffic, yet whale deaths still decreased by 53.85%. However, a pivotal shift occurred from 2022 to 2023; ship

traffic declined by 18.56%, but whale deaths skyrocketed by 216.67%. This period coincides with a fourfold increase in surveying activities related to wind farm development, leading to an alarming spike in whale fatalities in the New York/New Jersey area. Specifically, 21 humpback whales perished, which, according to Gotham Whales' August 2022 count of 280 humpbacks in the region, represents a significant loss of 7.5% of the population. Moreover, NOAA's estimation that only one-third of whale deaths are detected suggests the actual impact could be even more devastating.

We agree with Dr. Gerasoulis' belief that these findings starkly contradict the argument that increased ship traffic is to blame for the rise in whale deaths. Instead, they implicate the intensification of surveying traffic, linked to wind farm development, as a significant factor. Given that a substantial 7.5% of the humpback whale population in this region was lost in a single year, and considering NOAA's admission that we may only be observing a fraction of the true number of fatalities, it's clear that the environmental implications of proceeding with wind turbine construction in this sensitive area are profound. This data mandates immediate, comprehensive research and a cautious approach by both the Bureau of Ocean Energy Management (BOEM) and NOAA before any further development is considered.



PEIS Section 3.63 Demographic, Employment and Economics Lacks Critical Information and Mitigation

In Section 3.63 Demographic, Employment and Economics, BOEM claims that this section includes a discussion of the analysis area and the potential impacts from the Proposed Action, alternatives and ongoing and planned activities. There is a

reference to Appendix B, Supplemental Information and Additional Figures and Tables for detailed demographic, housing and employment information. Where is the discussion of the impacts? This document serves no purpose in identifying the offshore wind impacts to the New Jersey economy along with cost impact of offshore wind projects to ratepayers. Without this analysis, the ratepayers/residents, businesses will not have a clear understanding of the impact to their energy bills and any cost/ benefit analysis will be incomplete.

In determining the number of jobs gained or lost due to the projects, the lack of any analysis concerning lost jobs in the commercial and industrial businesses due to higher energy costs results in an incomplete and misrepresented cost/benefit analysis. In addition, higher energy costs impacting our government municipalities, counties and school districts which will be passed onto taxpayers should be included. The lost jobs in the current fossil fuel energy industries, including but limited to South Jersey Gas headquarters in Atlantic City should be included. Offshore wind companies and BOEM's EI analysis is misleading as it only includes jobs gained and ignores jobs lost. Both positive and negative impact to jobs and impact to costs for ratepayers and taxpayers must be included in future COPs and DEIS documents. Lastly, any payments made from taxpayer money to fund offshore wind facilities, wind ports etc. must be included in the economic analysis as an offset to job numbers or economic impact, as these payments are transfer payments from taxpayers used to "buy" jobs and fund the offshore wind economy. Without these adjustments to the usual Wind Developers and BOEM's calculations of economic impact, their conclusions will be misleading and highly inaccurate.

The BOEM PEIS lacks any discussion concerning intermittent offshore wind's contribution to grid unreliability, how this will be mitigated and at what cost. For the first time, in August 21, 2023, the North American Electric Reliability Corporation (NERC) identified energy policy as a risk priority for grid reliability because the heightened legislative focus and mandates regarding decarbonization, decentralization, and electrification. The organization holds that the emerging resource mix is more susceptible to long-term, widespread, and extreme events like sustained loss of wind power. (https://www.nerc.com/news/Pages/Collective-Focus-Imperative-for-Mitigating-Emerging-Risks-to-Grid-Reliability.aspx)

If the purpose of the projects is to meet the governor's goal, by executive order, for the State to sell 100% clean energy by 2035 including 11 GW of offshore wind, how do the wind developers and BOEM propose to back up the wind when it is not blowing? What is the cost of this backup? What are the plans and cost of battery backup storage systems? According to Science Daily, "energy droughts" in wind and solar can last a week. (DOE/Pacific Northwest National Laboratory, December 11, 2023) . BOEM and wind developers use a misleading measurement called a capacity factor in their discussions of offshore wind energy output, but this number – typically 50% - is misleading in that it is an average. This average does not account

for the times when generated wind energy exceeds demand and when wind energy is less than demand. For example, there could be days when the wind turbines are only producing 20% of their energy capacity but demand requires 80% capacity. There will be other days when wind energy supply will be at 70% of its capacity but demand will only be at 50%. A rigorous multiyear supply/demand accounting would inform us of the balancing costs, back-up costs and grid costs related to the true issues of intermittency.

Again, going back to the purpose of the project, which is to produce electric power not to just install structures, the PEIS must present operational data. Offshore wind is an intermittent energy source. With typically reported capacity factors of about 40 percent a wind turbine only operates for an equivalent 146 days a year, so an understanding of the "downtime" needed for maintenance and repairs is needed to determine the benefit of the project and contrast that with its environmental impact.

Therefore, the PEIS should have included an analysis of failure modes, their frequency, repair methods and time needed and the expected environmental impacts of doing those repairs. The companies must have this information and it should be disclosed. The overall loss of operating time on the wind complex should be stated. In addition, it should say what will be done with a turbine that cannot be repaired. Will it remain there for the duration of the lease or will it be decommissioned early?

The failure rates for smaller turbines,2 to 4-megawatt, show that 50 percent of those turbines undergo a major repair or replacement each year. That could involve a substantial downtime to diagnose the problem, secure parts, and make the repair which could significantly affect the capacity factor and the power production. The nature of the repair could also be important in terms of environmental impact in terms of additional vessel traffic and failures involving oil leakage so the nature and environmental impact of such repairs needs to be presented.

Such an analysis and mitigation measures should be presented for both the turbines and the transmission cables. It is our understanding that the project will use new very high voltage lines not previously tested under actual conditions. A failure of an export cable could have a dramatic impact on annual power production. The PEIS should present the expected failure modes and explain how the problem will be isolated and repaired, along with the expected downtime.

The PEIS does address the risk of sabotage and the socioeconomic disruption that would follow it. In today's world the threat of sabotage to offshore wind projects is real (witness the sabotage of the Nord stream pipeline). Because of their locations the turbines are easily accessible. While the structures are robust and separated, the transmission stations and transmission corridors where the power from many

turbines comes together would be the more likely targets. One or two hits could knock out many megawatts of power. The structures and rotating blades produce radar clutter which can make it difficult to detect intruders on the surface. Subsurface activities would be expected and difficult to detect due to the underwater vibration noise from the turbines and transformers.

The PEIS should provide an assessment of the risk and potential mitigation. It should show consultation with the DOD and preventive measures. It should include consultation with the BPU and electric utilities and show how back up power will be provided. While the PEIS process need not spell out the details of the security plan, it should include consultation with law enforcement to ensure an effective response plan is put in place by the operator if an incident occurs. A comment along those lines should be included in the PEIS to assure the public that appropriate precautions have been taken and a specific judgment made by BOEM on the acceptability of the risk and the impact on system reliability. Such plans are routinely required of nuclear projects with specific threat levels assessed, addressed, and tested such as the Aircraft Impact Rule.

What are the risks of building an energy system, such as offshore wind, that is dependent on weather when BOEM outlines in the PEIS that weather events will continue to be more severe and catastrophic. BOEM claims that the PEIS is a more holistic approach to determining the impacts of offshore wind. The wind developers and BOEM include standard statements about the purpose and need for the offshore wind projects to achieve climate goals. But, without including the determination of impacts and mitigation of offshore wind intermittency, grid reliability and weather dependent energy in the environmental impact studies, the studies are incomplete and misleading.

The PEIS Does not Adequately Address Hurricane Impact and as Result BOEMis Exposing Taxpayers and Rate Payers to a Huge Financial Risk

The PEIS includes one paragraph (Vol 1,page 2-22) regarding hurricanes and storms and fails to offer any mitigation measures of how energy would be restored.

NJBPU, in its 2/14/24 Memorandum, Docket No. QO24010008, addresses their concerns over hurricane impact to the viability of wind energy off the east coast. Per their memo, they state,

“Atlantic hurricanes pose a significant potential threat to the State’s burgeoning OSW sector. Despite this risk, relatively little technical research has been devoted to quantifying and assessing Atlantic hurricane impact upon OSW projects. As a result, regulators, developers, and insurers have limited tools at their disposal to mitigate this risk or ascertain whether the risk warrants design modifications. The prevailing uncertainty surrounding what is widely perceived as a substantial threat

to OSW, largely without scientific or engineering backing, serves as a considerable obstacle to the development of OSW. Development of advanced technical research quantifying and assessing hurricane risk is therefore necessary to aid developers, regulators, and insurers in mitigating hurricane risk and providing improved design standard baselines."

The NJBPU is working with NOWRDC to prepare an in-depth analysis of the hurricane threat and the study will only begin on March 1, 2024 and conclusions are expected to be completed by February 2026.

This timeline and lack of knowledge puts ratepayers and taxpayers at great risk since investment of taxpayer and rate payers money continues without sufficient knowledge of hurricane impact on offshore wind energy. As decommissioning funding policy becomes more lax and private insurance coverage seems more costly and less likely, taxpayers and rate payers will be footing the bill for damages.

The PEIS Does Not Sufficiently Address Fishing Industry Impact and Proposed Mitigation Will Not Save the Industry

The fishing industry has grave concerns over the impact of the project. Ed Baxter, a commercial fishman with the Fishermen's Dock Cooperative in Point Pleasant Beach, NJ claims, "what we're really worried about is the cabling. It's death." According to Baxter, "The offshore power cables and export cables coming ashore could potentially shut mobile gear fisheries like scallop dredging out of those routes, if fishermen can't be safe that their gear won't snag on the cables." This is especially concerning because the Orsted Block Island Wind Farm of five turbines has had problems maintaining adequate sediment coverage over its cables. Problems with maintaining cable depth have been reported with the ongoing Vineyard Wind project, too, according to Baxter. The New York Bight cable routes could run near an area called Mud Hole, a shallow trench between the ship traffic lanes should of New York Harbor which is a very productive fishing area. Fishing in this area can all be endangered by offshore wind development.

Fisherman are concerned too with future offshore substations and their cooling water systems which handle water at 86-90 degrees F along with a lack of transparency about anti-fouling chemicals that may be in the water systems. Seawater life pumps can accelerate the maturing process for larvae, disrupt the natural process and can lead to high mortality rates and fish defects. Offshore wind structures will have their own SWLP capable of generating an average of 4-5.3 million gallons of water flow per day. This extreme power brings water and anything small enough to fit through the steel bar filters to the surface in minutes. BOEM has yet to document the temperature of the discharge water by the cooling systems although it claims that warm water effects on surrounding ocean are "likely to be extremely minimal". But there is no research to support this claim. Mitigation

includes banking on engineering advancements but there is no confirmation on the effects. The entrainment of ichthyoplankton during operation is based on outdated NOAA National Centers of Environmental Information (NCEI) electronic database. Estimates are from NOAA's Marine Resource Monitoring Assessment, and Prediction (MARMAP) program from 1977 to 1987 and by the Ecosystem Monitoring program from 1995 through 2017 throughout the North Atlantic region. Based on BOEM reporting on entrainment, the mortality for plankton is assumed to be 100%. Higher water temperatures typically accelerate species' lifecycles including but not limited to lobser egg production ,cod egg development, pollack spawning, monkfish egg disintegration, and haddock eggs.

The Point Pleasant Fishing co-op claims that the tallies listed in the PEIS for the value of landings from the six lease areas between 2008-2021 are understated. The table was modeled using Vessel Trip Report and vessel logbook data to estimate catch and landings based on the percentage of a trip that overlapped with each lease area, according to BOEM documents. According to Point Pleasant co-op, "The numbers are not averages. Instead, they are taking the lowest year they can. NOAA Fisheries itself won't use Vessel Trip Reports data in stock assessment." BOEM must defer to the fishing industry and NOAA in determining the baseline statistics for fish catch and landings. Without accurate numbers, the true impact and mitigation will be inaccurate and ineffective to say the least. The mitigation measures listed in the COMFIS-6, Table G-1, are not an acceptable solution to the fishing industry or the loss of a sustainable food source.

Typical of BOEM, in table 4.2-1, its document preparers recite their cookie cutter, unrealistic conclusions about the impact of the offshore wind project on the commercial fisheries and for hire recreational fishing but fail to answer the question whether the fishing industry and a sustainable food source will survive offshore wind.

> "Based on the anticipated duration of construction and installation and O&M activities, BOEM does not anticipate irreversible impacts on commercial fisheries and for-hire recreational fishing. The NY Bight projects could alter habitat during construction and installation and O&M activities, limit access to fishing areas during construction and installation, or reduce vessel maneuverability during O&M. However, the conceptual decommissioning of the NY Bight projects would reverse those impacts. Irretrievable impacts (lost revenue) could occur due to the loss of use of fishing areas at an individual level."

The PEIS Fails to Address GHG Emissions and SF6 and Mitigation is Inconsistent with the Project's Goals

The section AQ, Table G-1, of mitigation measures for reducing GHG is nothing more than window dressing. The mitigation measure, AQ-1 acknowledges that the offshore wind developers will continue to use SF6 and must evaluate the "feasibility of using non SF6". Lessees are "encouraged" to replace diesel fuel with alternatives and "encouraged" to replace combustion engines with zero -emissions technologies. These mitigation measures have no teeth in actually requiring developers to take any real measures to reduce their carbon footprint.

According to the EPA, SF_6 is the most potent greenhouse gas known to date. It has an atmospheric lifetime of 3,200 years and a "relatively small amount of SF_6 can have a significant impact on global climate change."

Previous EIS documents have significantly minimized the amount of SF_6 that will be used in the offshore wind projects. In previous documents, BOEM recognizes SF_6 as "the most potent greenhouse gas known."

Offshore wind developers and BOEM have incomplete of not only the number of offshore substations (OSS), but it has failed to mention the use of SF_6 in each of the turbines. The PEIS does not disclose the potential full amount of SF_6 that may be used in the projects. The PEIS fails to mention the use of SF_6 in each wind turbine generator. Considering that BOEM has admitted in previous EIS documents that there is a yearly loss of SF_6 from switchgear, disclosing the full amounts that may be used in these projects is crucial. The PEIS does not disclose expected leakage of SF_6 in its table listing project emissions.

There is no mention of a potential accidental release of SF_6, such as happened at the Seagreen offshore wind area in the North Sea in June of 2022, forcing the crew to evacuate their rig. The EPA states that leaks of SF_6 can occur during "installation, maintenance and servicing, and decommissioning" of equipment that contains the gas.

The PEIS does not fulfill its purpose outlining the environmental impact concerning SF_6 use, since that does not begin and end with the Atlantic Shores projects.

As BOEM has previously stated (1), "...the impact of GHG emissions does not depend upon the source location." Since numerous wind energy projects, in the NJ/NY area will be using SF_6 in OSSs and wind turbines, the singular approach in evaluating the environmental impact of just NY Bight makes the PEIS flawed and too limited to fulfill its purpose.

The PEIS ignores the Deoxygenation Potential of Offshore Wind Areas.

Offshore wind projects have the potential to increase sediment carbon in deeper areas of the ocean due to reduced current velocities, and negatively impact

decreased dissolved oxygen within areas that currently have low oxygen concentration. In European wind farm areas, there is evidence that ongoing offshore wind farm developments can have a substantial impact on the structuring of coastal marine ecosystems on basin scales.

Recently, Floeter et al. (Floeter, J. et al. Pelagic effects of offshore wind farm foundations in the strati!ed North Sea. Prog. Oceanogr. 156, 154–173 (2017). provided empirical evidence for the existence of these upwelling/down-welling dipoles showing distinct structural changes in mixed layer depth and potential energy anomaly inside the wind wake area of OWFs in the summer stratified area of the southern North Sea. (Floeter, J. et al. Pelagic effects of offshore wind farm foundations in the stratified North Sea. Prog. Oceanogr. 156, 154–173 ,2017) including,

- An increase in sediment carbon due to the reduced velocities in the water columns, and
- An Increase in dissolved oxygen in the pelagic and benthic region.

A first assessment of the large-scale integrated impact of atmospheric wakes from already existing OWFs on the hydrography of the southern North Sea revealed the emergence of large-scale oceanic structures with respect to currents, sea surface elevation, and stratification.

Daewal et al. (2022) (Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. Ute Daewel et al. 2022. 3:292. https://doi.org/10.1038/s43247-022-006250 , www.nature.com/commsenv studied the impacts of primary production and bottom water deoxygenation in the North Sea. The researchers examined modifications in mixing and stratification in relation to impacts with nutrient availability in the euphotic zone. Their concerns examined the ecosystem impacts for some obvious reasons: (i) Changes in nutrient concentration would start a cause-effect chain that translates into changes in primary production and effectively alters the food chain; (ii) In a dynamic system like the southern North Sea, which is characterized by strong tidal and residual currents, changes in the biotic and abiotic environment are exposed to advective processes; (iii) The expected changes depend strongly on the prevailing hydrodynamic conditions, which makes it difficult to disentangle natural from inflicted changes. Other than a high-density suite of physical and biological observations, numerical modeling studies are the only means to build BACI studies as scenarios with and without the disturbance can be simulated. Theoretical scenario simulations provide evidence that the increasing amount of future OWF installations will substantially impact and restructure the marine ecosystem. Changes in mixed layer depth have been reported earlier in North Sea wind area as a consequence of offshore wind farm wakes due to the reduced wind induced mixing, but also due to the upwelling and downwelling dipoles Since the

dipole structure is associated with both an uplift and a depression in mixed layer depth and is variable in dependence of the wind direction.

The marine ecosystem responds very clearly to the changes in the atmosphere leading to changes in ocean stratification, advective processes and a systematic decrease in bottom shear stress. These changes can be expected to progress into higher trophic levels of the marine ecosystem. Additionally, the estimated changes in organic sediment distribution and quantity could have an effect on the habitat quality for benthic species. Spatial distributions might change as it has been shown to depend on the available food quantity and quality as well as the prevailing bottom shear stress.

The PEIS should have presented the level of impacts on re-structuring of marine ecosystems on energy extraction both above and below sea level.

Impacts on the regional atmosphere, multiple physical, biological and chemical impacts on the marine system must be identified in the project PEIS. Complicating these effects, underwater structures, such as foundations and piles may cause turbulent current wakes, which impact circulation, stratification, mixing, and sediment resuspension.

The PEIS Incorrectly Dismisses Impact to Cold Pool

The PEIS dismisses as an alternative to minimize an important factor impacting marine habitats and migratory patterns on the midAtlantic shelf called the “Cold Pool”. This seasonal thermocline is one of the largest of its kind in the global ocean and extends from Nantucket to Cape Hatteras. Wind turbines have been shown to impact the mixing of ocean water both at the surface through their change in wind energy and at other levels through their physical structure.

The PEIS on table 2-3 makes passing mention of the mid Atlantic cold pool but subsequently in the no action or the action alternatives does not present or any assessment of the impacts on it. This is a glaring omission the PEIS. The PEIS needs to provide a full assessment of the impact to the cold pool, not just from this project but from all reasonably foreseeable actions, including its own wind project approvals between the Hudson Shelf valley and Cape May, NJ.

Beyond that, the impact on the Cold Pool, both off the New Jersey coast and more broadly off the mid-Atlantic shelf, from this project and in conjunction with the other foreseeable offshore wind projects must be carefully assessed. As mentioned in the July 22, 2020 report of the Science Center for Marine Fisheries Management (a project funded by the National Science Foundation) in its critique of the BOEM Supplementary Environmental Impact Statement for the Vineyard Wind Project:

> "Too much attention cannot be given to the Cold Pool" and "The weakening of the Cold Pool supports the potential of generating the most catastrophic ecological event on the continental shelf the world has ever seen".

On page 3.4.2-13 of the PEIS, BOEM states that offshore wind facilities could have impacts on the cold pool and admits that relatively few studies have analyzed the hydrodynamic wakes coupled with the interaction of atmospheric wakes with the sea surface. Further, even fewer studies have analyzed wakes and their impact on regional scale and oceanographic process (cold pool). On page 3.5.2-29, BOEM states that few studies have evaluated the secondary impacts of atmospheric wakes, the interaction with the sea surface and the regional changes of oceanographic patterns (cold pool) and primary productivity. On page 3.5.6-49, BOEM states that changes in the cold pool dynamics resulting from future activities, should they occur, could conceivably result in changes in habitat suitability and fish community structure, but the extend and significance of these potential effects are unknown.

The potential impact of cumulative impact of the Atlantic Coast offshore wind projects, including the New York Bight, on the Cold Pool should be clearly understood before this or any new projects are permitted.

.

The PEIS Does Not Adequately Address the Potential Impact of Offshore Wind Projects on Freshwater Aquifer, Shoreline Sinking, and Potential Catastrophic Offshore Landslides.

A Rutgers study on the impact of climate change (New Jersey's Rising Seas and Changing Coastal Storms: Report of the 2019 Science and Technical Advisory Panel – Kopp, et al, 2019) identifies two major components to rising sea levels at the NJ shore – global warming and the sinking shoreline. Contributors to the sinking shoreline include "glacial isostatic adjustment" (GIA) which is tied to the fresh water aquifers that underlie the continental shelf, and sediment compaction which is due to increasing weight on the developed land.

Another study shows the connection between the onshore aquifers and the huge deep freshwater aquifer that extends out to the edge of the continental shelf (Aquifer Systems Far Offshore on the US Atlantic Margin – Gustafson, et al, Scientific Reports 9, article 8709 2019).

And a study (Overpressure and Fluid Flow in the New Jersey Continental Slope: Implications for Slope Failure and Cold Seeps authored by Dugan and Flemings and published by in Science July 14 2000) documents the instability in the NJ seabed above the deep aquifer. That study was reported in Science News July 25, 2000 under the title Trapped Water Could be a Cause for Underwater Landslides, Tidal Waves.

The PEIS , on page 3.4.2-7, states that "groundwater reservoirs underlie areas where onshore project activities could occur. Some of these reservoirs provide water supplies to communities, including USEPA-designated sole source aquifers, which are aquifers that supply at least 50-percent of the drinking water for an area with no other sources available if the aquifer is contaminated. Sole-source aquifers that overlap areas where onshore project activities may occur include the New Jersey Coastal Plains aquifer system, Kings/Queens Counties (Brooklyn-Queens) aquifer system, and the Nassau/Suffolk Counties Long Island aquifer system. On page 3.4.2-18, BOEM states that impacts from accidental releases on water qaility would result in negligible and temporary impact on surface and groundwater quality including sole source aquifers."

Therefore, the PEIS does not adequately address this very significant issue. BOEM in other EIS documents has stated that "Very few studies have examined the effects of substrate vibration from pile driving, yet many have acknowledged that is a field of urgently needed research". Nor has there been a programmatic analysis done of the multiple projects planned off the northeast Atlantic coast to evaluate the combined potential impact on the unstable ocean floor from these massive industrial developments.

Atlantic Coast projects contemplate 1800+ massive 900-1300 ft tall turbines as close as 9 miles to the NJ shore which will likely have monopole bases that are each 15 meters in diameter and each weigh 2500 tons (5 million pounds). They will be pile driven up to 242 feet into the seabed with repeated hammer strokes each up to 4400 kilojoules. And these giant turbines will generate significant continuous low frequency operating vibrations that will be transmitted into the ocean floor for their entire multi - decade operating life.

The public needs assurance that these massive projects will not impact our fresh water aquifers, that they will not exacerbate the current sinking of the NJ shore line related to the changing pressure dynamics of the underground aquifers, and that they will not trigger underwater landslides in the unstable continental shelf. Therefore, this subject requires much more analysis in the PEIS and future EIS documents.

The PEIS Does Not Address the Cumulative Impact of Vessel Traffic for Atlantic Coast Projects

The PEIS disconcertingly states that that a single project in the NY Bight lease areas would generate a small increase in vessel traffic and that cumulative vessel traffic in the NY Bight would only increase from minor to moderate impacts. What this ignores is the total number of vessels in the ocean during the construction of the 6 projects as well as vessels traveling in the ocean in nearby projects located in leases numbers 0499,0549,0532,and 0512. According to tables 3.6.6-8, 9, cable trenching vessels, turbine foundations vessels, survey vessels, operation and maintenance

vessels will be in the ocean off the NJ coast for 12 leases off the NY coast during the years of 2024-2035. Just off the coast of New York there will be 1218 vessel round trips for construction and 2188 round trips for operation and maintenance. This is in addition to the vessel traffic for the projects off the coast of New Jersey in lease area numbers 0499, 0549. 0532, 0512 which the document preparers fail to include.

Respectfully Submitted,

Defend Brigantine Beach Inc. and Downbeach
Katie Finnegan, President
Dr. Suzanne Moore, Treasurer
Tom Jones, Secretary
Sherri Lilienfeld, Downbeach Coordinator

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Appendix A.

Level A Takes	TOTAL ANNUAL	US Wind	Park City Wind	Sunrise Wind	SouthCoast Wind (formerly Mayflower Wind)	Atlantic Shores	Empire Offshore Wind
Type		Operation & Const	Operation & Const	Operation & Const	Construction	Construction	Contruction
Lease number		0490	0534,0501 (SW PORTION)	0487	0521	0499	512
Area		MD	MA	NY	MA	NJ	
Renewal/Initial							
Inprocess/Active		Inprocess	Inprocess	Inprocess	Inprocess	Inprocess	Inprocess
Date		1/1/25-12/31/29	3/27/25-3/26/30	11/20/23-11/19/28	2025-2030	2025-2029	1/22/24-1/21/29
NORTH ATLANTIC RIGHT WHALE*	-					-	
BLUE WHALE *	-					-	
FIN WHALE	46	2	1	4	25	-	1
SEI WHALE *	8	1	1	2		-	
MINKE WHALE	68	1	4	27		-	4
HUMBACK WHALE	36	2	1	3		-	
SPERM WHALE*	1		1			-	
ATLANTIC WHITE-SIDED DOLPHIN	29		1			-	
ATLANTIC SPOTTED DOLPHIN	1		1			-	0
PANTROPICAL SPOTTED DOLPHIN	-					-	
BOTTLENOISE DOLPHIN (WN ATLANTIC OFFSHORE)	20		1			-	
BOTTLENOISE DOLPHIN (NORTHERN MIGRATORY COASTAL)	22					-	
COMMON BOTTLENOSE DOLPHIN (S MIGRAT)	-					-	
WHITE BEAKED DOLPHIN						-	
LONG-FINNED PILOT WHALE	10		1			-	
KILLER WHALE						-	
FALSE KILLER WHALE						-	
SHORT FINNED PILOT WHALE	1		1			-	
CUVIER'S BEAKED WHALE	-					-	
MESOPLODONT WHALE	-					-	
RISSO'S DOLPHIN	8		1			-	1
STRIPED DOLPHIN						-	
ROUGH TOOTHED DOLPHIN	-					-	
SHORT BEAKED COMMON DOLPHIN	-					-	
COMMON DOLPHIN	36		1			-	
PILOT WHALE	-					-	
HARBOR PORPOSE	308		56	20	109	-	
GRAY SEAL	62		8	3	14	-	
HARBOR SEAL	95		17	5	30	-	
HARP SEAL	10		8			-	
*Endangered	761	6	104	64	178	-	6

Defend Brigantine Beach INC and Downbeach

P.O Box 562 Brigantine, NJ 08203

defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Level B Takes	TOTAL ANNUAL	Atlantic Shores Takes	Bluepoint Wind	Atlantic Shores	US Wind	Park City Wind	Sunrise Wind	TerraSond	SouthCoast Wind (formerly Mayflower Wind)
		Total	Surveys	Surveys	Operation & Const	Operation & Const	Operation & Const	Surveys	Construction
Lease number			0537	0499,0541,0549	0490	4,0501 (SW PORTI	0487	0545,0546	0521
Area			NY/NJ BIGHT	NY, NJ, DEL, MD	MD	MA	NY	NC/SC	MA
Renewal/Initial			Renewal						
Inprocess/Active			Inprocess	Inprocess	Inprocess	Inprocess	Inprocess	Inprocess	Inprocess
Date			3/1/24-2/28/25	4/1/24-3/31/25	1/1/25-12/31/29	3/27/25-3/26/30	11/20/23-11/19/28	2/1/23-2/1/24	2025-2030
NORTH ATLANTIC RIGHT WHALE*	449	15	11	2	2	19	35	3	119
BLUE WHALE *	13	-					4		
FIN WHALE	1,407	23	63	4	4	11	78	2	400
SEI WHALE *	249	13	15	2	1	6	31		55
MINKE WHALE	3,248	93	149	17	3	41	419		878
HUMBACK WHALE	1,327	27	27	3	3	8	89	2	272
SPERM WHALE*	222	7	5			3	14	1	94
ATLANTIC WHITE-SIDED DOLPHIN	10,084	126	316	21		31	639	628	3,070
ATLANTIC SPOTTED DOLPHIN	5,076	375	162	25	24	31	114		2
PANTROPICAL SPOTTED DOLPHIN	25	-			5				
BOTTLENOISE DOLPHIN (WN ATLANTIC OFFSHOR	24,898	1,784	204	291	847	20	425	631	2,056
BOTTLENOISE DOLPHIN (NORTHERN MIGRATORY	13,694	3,632	730	455					
COMMON BOTTLENOSE DOLPHIN (S MIGRAT)	37,429	-						38	35,807
WHITE BEAKED DOLPHIN		-							
LONG-FINNED PILOT WHALE	1,170	89	50	9	27	18			
KILLER WHALE		-							
FALSE KILLER WHALE		-							
SHORT FINNED PILOT WHALE	501	12				10			
CUVIER'S BEAKED WHALE	58	-						3	
MESOPLODONT WHALE	14	-						3	
RISSO'S DOLPHIN	2,545	128	38	8	9	8	47		1,336
STRIPED DOLPHIN		-							
ROUGH TOOTHED DOLPHIN	29	-						19	
SHORT BEAKED COMMON DOLPHIN	23,371	-			29				
COMMON DOLPHIN	66,477	985	3,456	185		222	7,393	49	
PILOT WHALE	1,123	-					58	26	541
HARBOR PORPOSE	14,818	555	958	97		296	1,008	3	2,537
GRAY SEAL	16,723	1,472	861	207		346	1,099	2	2,818
HARBOR SEAL	23,927	1,662	861	207		776	2,468	2	5,150
HARP SEAL	567	-				346			
*Endangered	249,503	10,998	7,906	1,533	954	2,192	13,921	1,412	55,135

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Level B Takes	Atlantic Shores Construction	Empire Offshore Wind Contruction	Dominion Energy Construction	Park City Wind Surveys	Revolution Wind Construction	Orsted Wind Power NA Surveys	Ocean Wind 1 Contruction
Lease number	0499	512	0483	0534	0486	0486,0487,0500	0498
Area	NJ		VA	MA-NY	RI	NY-MA	NJ
Renewal/Initial				Reissuance		Renewal	
Inprocess/Active	Inprocess	Inprocess	Active	Active	Active	Active	Active
Date	2025-2029	1/22/24-1/21/29	2/5/24-2/4/29	3/1/24-2/28/25	11/20/23-11/19-28	10/6/23-10/5/24	10/13/23-10/12/28
NORTH ATLANTIC RIGHT WHALE*	5	13	6	30	50	17	7
BLUE WHALE *				1	3		4
FIN WHALE	4	136	108	60	101	14	13
SEI WHALE *	5	4	3	5	21	3	3
MINKE WHALE	6	83	51	37	363	13	74
HUMBACK WHALE	3	63	125	46	263	34	66
SPERM WHALE*	3	3	3	5	8	2	9
ATLANTIC WHITE-SIDED DOLPHIN	25	747	15	1,014	312	210	100
ATLANTIC SPOTTED DOLPHIN	200	90	2,042	29	87	29	135
PANTROPICAL SPOTTED DOLPHIN			20				
BOTTLENOISE DOLPHIN (WN ATLANTIC OFFSHOR	225		3,888	399	375	139	1,360
BOTTLENOISE DOLPHIN (NORTHERN MIGRATORY	1,949	4,935					1,394
COMMON BOTTLENOSE DOLPHIN (S MIGRAT)							1,584
WHITE BEAKED DOLPHIN							
LONG-FINNED PILOT WHALE	40			86		52	30
KILLER WHALE							
FALSE KILLER WHALE							
SHORT FINNED PILOT WHALE	12						30
CUVIER'S BEAKED WHALE							
MESOPLODONT WHALE							
RISSO'S DOLPHIN	60	200	25	30	43	30	90
STRIPED DOLPHIN						20	
ROUGH TOOTHED DOLPHIN							
SHORT BEAKED COMMON DOLPHIN		9,870				6,000	
COMMON DOLPHIN	112		1,660	10,176	10,521		
PILOT WHALE		417	54		27		
HARBOR PORPOSE	35	243	22	759	1,283	287	350
GRAY SEAL	155	484	56	400	1,073	118	305
HARBOR SEAL	345	678	56	897	2,669	118	844
HARP SEAL		4					
*Endangered	3,184	17,970	8,134	13,974	17,199	7,086	6,398

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Level B Takes	Atlantic Shores Offshore Wind Bight Surveys	Vineyard NE Surveys	Ocean Wind II Surveys	Invenergy Wind Offshore (NY Bight) Surveys	Community Offshore Wind (NY Bight) Surveys	Attentive Energy (NY Bight) Surveys	Atlantic Shores Offshore Wind Surveys
Lease number	0541	0522,0544	0532	0542	0539	0538	0499,0549
Area	NJ,NY	MA-NJ	NJ	NJ, NY	NJ, NY	NJ, NY	NJ, NY
Renewal/Initial							
Inprocess/Active	Active	Active	Active	Active	Active	Active	Active
Date	8/10/23-8/9/24	7/27/23-7/26/24	7/21/23-7/20/24	7/31/23-7/30/24	7/1/23-6/30/24	6/20/23-6/19/24	6/9/23-6/8/24
NORTH ATLANTIC RIGHT WHALE*	5	12	2	6	24	12	3
BLUE WHALE *		1					
FIN WHALE	9	20	4	18	76	38	6
SEI WHALE *	4	5	1	7	24	12	2
MINKE WHALE	46	46	8	92	304	179	24
HUMBACK WHALE	16	12	4	13	46	24	5
SPERM WHALE*	2	2	3	2	10	3	2
ATLANTIC WHITE-SIDED DOLPHIN	63	129	50	101	427	207	17
ATLANTIC SPOTTED DOLPHIN	100	29	15	42	320	89	50
PANTROPICAL SPOTTED DOLPHIN							
BOTTLENOISE DOLPHIN (WN ATLANTIC OFFSHOR	179	169	2,221	611	1,316	1,746	1,089
BOTTLENOISE DOLPHIN (NORTHERN MIGRATORY		45		795	115	389	1,228
COMMON BOTTLENOSE DOLPHIN (S MIGRAT)							
WHITE BEAKED DOLPHIN		30					
LONG-FINNED PILOT WHALE	20	17	20	15	78	21	20
KILLER WHALE		4					
FALSE KILLER WHALE		5					
SHORT FINNED PILOT WHALE							
CUVIER'S BEAKED WHALE							
MESOPLODONT WHALE							
RISSO'S DOLPHIN	30	9	30	10	59	23	30
STRIPED DOLPHIN							
ROUGH TOOTHED DOLPHIN							
SHORT BEAKED COMMON DOLPHIN		7,472					
COMMON DOLPHIN	588		400	888	5,572	2,056	100
PILOT WHALE							
HARBOR PORPOSE	281	347	72	950	1,912	1,095	142
GRAY SEAL	374	418	13	950	1,955	1,596	736
HARBOR SEAL	374	939	13	950	1,955	1,596	736
HARP SEAL							
*Endangered	2,091	9,711	2,856	5,450	14,193	9,086	4,190

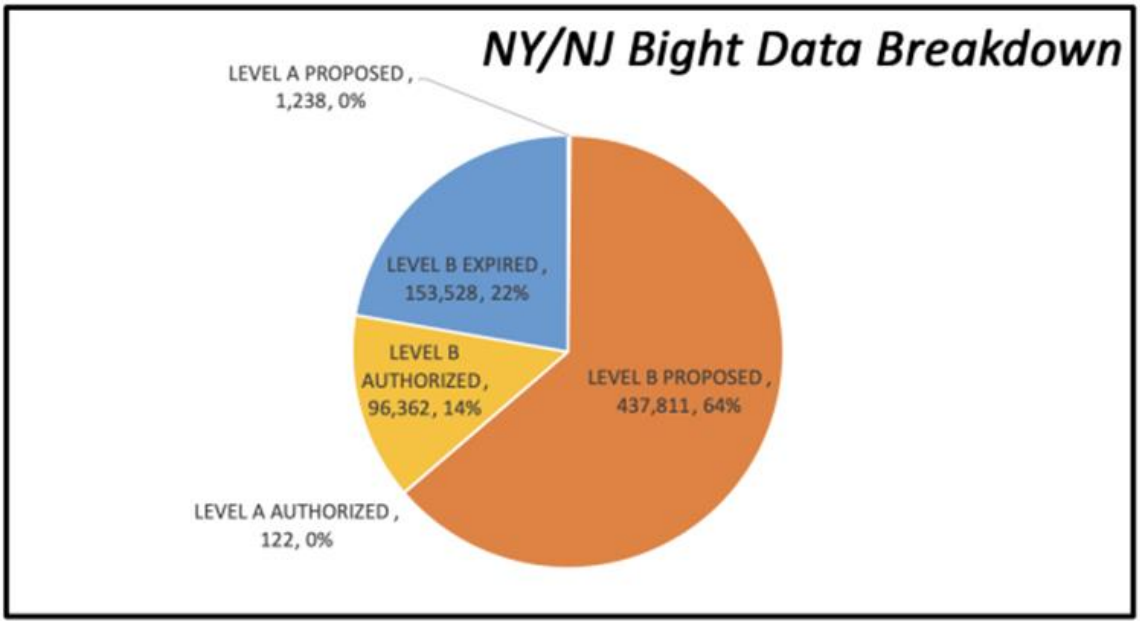
Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Level B Takes	TerraSond Limited (NYBight)	SouthCoast Wind Energy	Orsted Wind Power NA	Bluepoint Wind (NY Bight)	Vineyard Wind 1 llc
	Surveys	Surveys	Surveys	Surveys	Construction
Lease number	0539,0541,0542, Central Atlantic Call Area	0521	0482,0519	0537	0501
Area	NJ, NY	MA, RI	DE	NJ, NY	MA
Renewal/Initial			Reissued		
Inprocess/Active	Active		Active	Active	Active
Date	4/1/24-3/31/25	5/12/23-5/11/24	5/10/23-5/9/24	3/1/24-2/28/25	5/1/23-4/30/24
NORTH ATLANTIC RIGHT WHALE*	15	6	11	14	20
BLUE WHALE *					
FIN WHALE	105	7	7	86	33
SEI WHALE *	13	2	1	20	4
MINKE WHALE	98	13	2	204	98
HUMBACK WHALE	52	55	4	36	56
SPERM WHALE*	32	2	3	6	5
ATLANTIC WHITE-SIDED DOLPHIN	345	28	50	432	1,107
ATLANTIC SPOTTED DOLPHIN	1,196	29	15	221	
PANTROPICAL SPOTTED DOLPHIN					
BOTTLENOISE DOLPHIN (WN ATLANTIC OFFSHOR	3,005	152	2,752	702	96
BOTTLENOISE DOLPHIN (NORTHERN MIGRATORY				1,659	
COMMON BOTTLENOSE DOLPHIN (S MIGRAT)					
WHITE BEAKED DOLPHIN					
LONG-FINNED PILOT WHALE	480	8	20	68	91
KILLER WHALE					
FALSE KILLER WHALE					
SHORT FINNED PILOT WHALE	449				
CUVIER'S BEAKED WHALE	55				
MESOPLODONT WHALE	11				
RISSO'S DOLPHIN	339	7	20	52	12
STRIPED DOLPHIN					
ROUGH TOOTHED DOLPHIN	10				
SHORT BEAKED COMMON DOLPHIN					
COMMON DOLPHIN	11,225	2,094	400	4,734	4,646
PILOT WHALE					
HARBOR PORPOSE	514	83	82	1,312	150
GRAY SEAL	993	167	4	1,179	414
HARBOR SEAL	822	74	4	1,179	214
HARP SEAL					217
*Endangered	19,759	2,727	3,375	11,904	7,163

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Federal Incidental Harassment Authorization (IHA) Marine Mammal Takes for All Offshore Wind Development Projects on the East Coast*

Take Category	NY/NJ Bight	Atlantic Coast
Level A Proposed Takes	1,238	1,306
Level B Proposed Takes	437,811	524,760
Level A Authorized Takes	122	122
Level B Authorized Takes	96,362	115,611
Level B Expired Takes	153,528	173,104
Totals	689,061	814,903



*Between April 24, 2014, and June 12, 2023

From Clean Ocean Action IHA_Summary.pdf (cleanoceanaction.org)

Data Summary

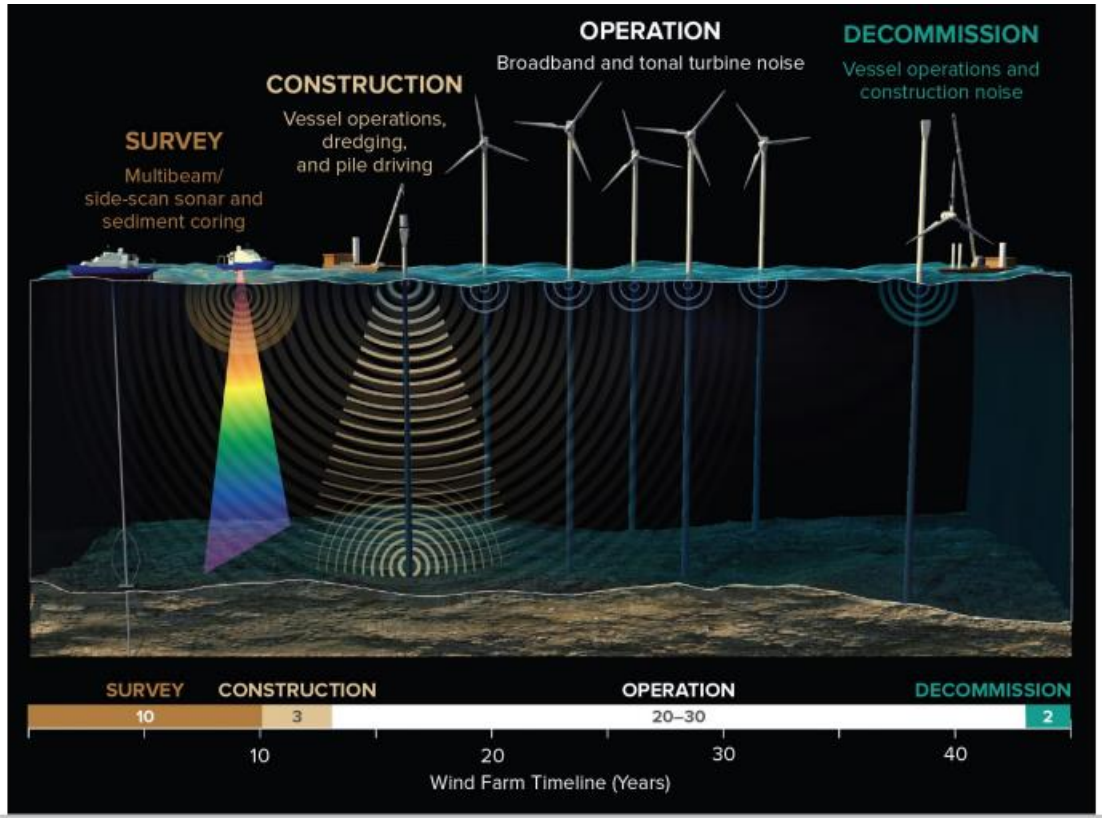
- All numbers of marine mammal takes have been collected from the National Oceanic & Atmospheric Administration (NOAA) Fisheries' webpages listing "In Process," "Authorized," and "Expired" Incidental Harassment Authorizations (IHAs).
- The number of marine mammal takes have been either categorized as "Proposed," "Authorized" and currently active takes, or "Expired."
- These IHAs have all been previously authorized or are currently under review by NOAA under the Marine Mammal Protection Act (MMPA) between April 25, 2014, and June 12, 2023.
- The NOAA website contains all IHA information for any planned or currently operating renewable energy projects in the United States. COA focused this research specifically on East Coast states, and specifically, the New York/New Jersey Bight.
  - In this research, the East Coast states with proposed, authorized, or expired IHAs for renewable energy projects include Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, and South Carolina. In the data table, the OSW development projects in these states have been categorized as the "Atlantic Coast."
- Specifically, when calculating total takes in the NY/NJ Bight, COA included all projects that conducted activities related to offshore wind projects in the Bight area (i.e., a permitted survey area). For example, many Massachusetts and Rhode Island projects are considered relevant as survey activities for these projects extend into the Bight.
  - The pie chart serves as a visualization of total IHA takes in the NY/NJ Bight. The chart depicts the 64% proposed level B takes, 22% level B expired takes, 14% level B authorized takes, as well as the level A proposed and authorized takes.
- In the NY/NJ Bight, these percentages reveal **689,061 total marine mammal takes** proposed, authorized, and expired for offshore wind energy projects.

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

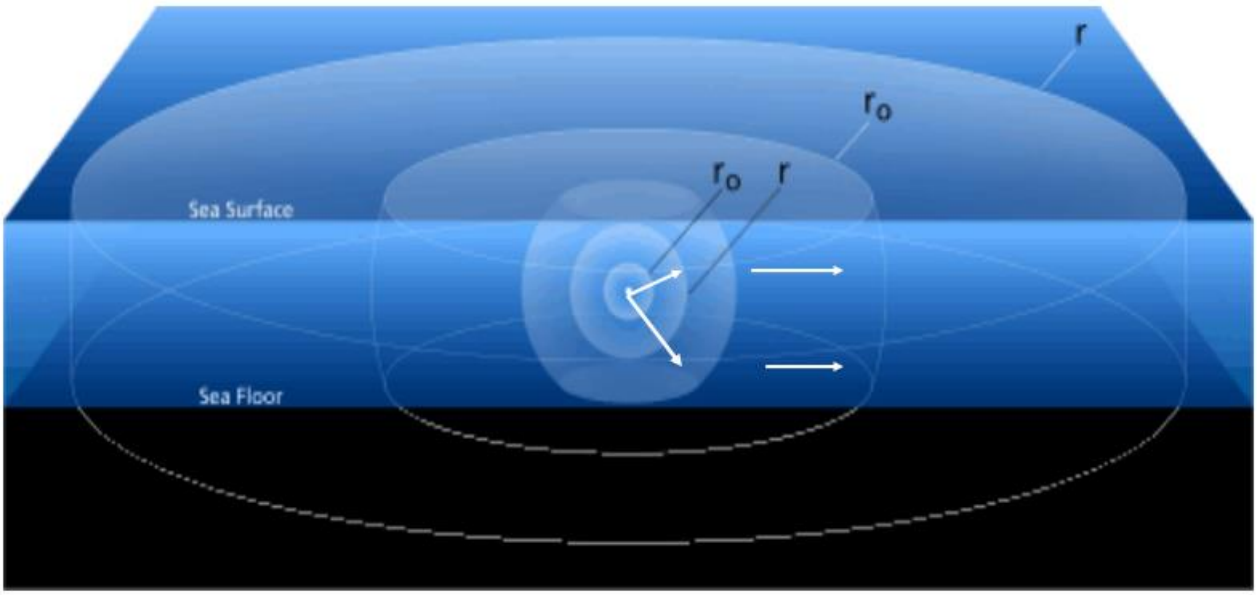
Appendix B.

Marine Mammal Noise Impact
-Offshore Wind Energy-

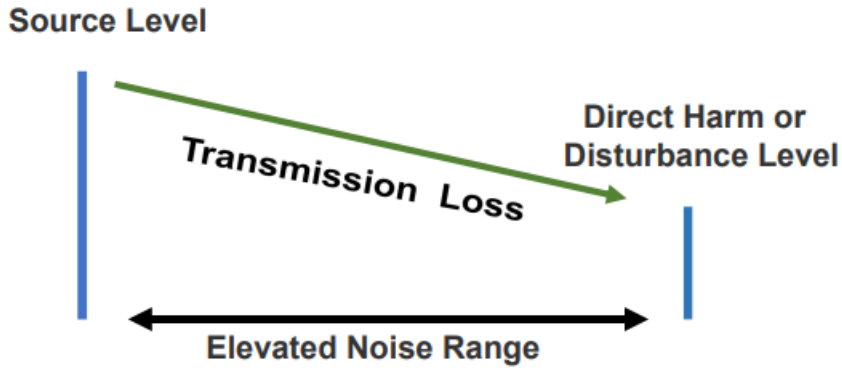
Bob Stern, Ph.D., President, Save LBI,
Former Director, office of Environmental compliance, U.S. Dept. of Energy



Noise Spreading and Dissipation



Source Levels (SL), Transmission Loss (TL), and Range (R) to Accepted Levels (AL)



Source Levels (SL), Transmission Loss (TL), and Range (R) to Accepted Levels (AL)

- Sound is measured in decibels (dB), a logarithmic or exponential scale, to cover wide ranges
- A "plus 10" increase in decibels means the noise intensity experienced is 10 times greater
- The Range at which elevated noise occurs varies exponentially with (Source level minus Accepted level) / Transmission loss, meaning that:
- Small changes in those cause very large changes in Range, and

Range x Density of the Mammals there = Harm

Legal Framework

Marine Mammal Protection Act,
- Level A "Takes", Fatality, Injury (e.g., hearing loss),
- Level B, Disturbance
- Small numbers affected (33% ?)
- Negligible impact

Endangered Species Act
- Jeopardize the continuing existence of a species,
- Adversely impact Critical Habitat

However, in the real marine mammal world, Level B disturbance can lead to:

- **Avoiding the noise or "standing off" from it in an undesirable direction or location, in a migratory setting obstructing or blocking it.**
- **If the mammal is between the shore and the source, being driven towards the shore seeking relief.**
- **Surfacing to seek a lower noise level and becoming more vulnerable to vessel strike.**
- **Separation of mothers and calves due to the "masking" of their normal communications, which can be fatal for the calf.**
- **Loss of its navigational ability, cessation of feeding or mating, loss of energy and the ability to detect predators or oncoming ships.**
- **Finally, because whales use sounds to determine the very nature of their surroundings, the effects may be much more profound than we know.**

So, behavior disturbance is not as innocuous as the name implies, and the Level A vs. Level B distinction is artificial.

Accepted Levels- in Decibels (dB)

	Permanent hearing Loss	Temporary Hearing Loss	Disturbance
Impulsive Noise, NMFS	219 dB Peak, 183 dB Energy	179 dB Energy	160 dB (50 % affected)
Impulsive Noise - for baleen whales, including right & humpback (Wood et al.)			120 dB (10% affected) 140 dB (50% affected) 160 dB (90% affected),
Non-Impulsive Noise, NMFS	199 dB		120 dB

Wood, J.D., Southall, Tolitt, PG,&E Offshore 3-D Seismic Survey Project Environmental Impact Report, 2012

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Vessel Surveys –Noise Impact

	National Marine Fisheries Service (NMFS)	More realistic
Source Level	203 decibels (dB)	205-211 dB
Transmission Loss- per tenfold increase in distance	20 dB	15 dB
Criteria- Noise Level to Get Down to	160 dB	140 dB (for baleen whales)
Range to 140 dB	**-----**	**13-34 miles**
Range to 160 dB	**1/10 mile**	**1/2-16 miles**

Vessel Surveys

- In a recent five-week period, five whales were washed up on New Jersey shores, plus 3 juveniles, plus another dead whale sighted 12 miles out soon after
- At least six vessels were doing geotechnical surveys off the New Jersey coast during that time frame using high intensity noise devices to characterize the seabed
- The **NMFS** estimates noise levels above its 160 dB criteria exist a **tenth of mile** from the vessel. Using documented measured noise source levels, a generally accepted noise dissipation rate, and more relevant noise disturbance criteria, that distance **increases exponentially to 13 to 34 miles**, depending on noise device settings.
- The noise levels from the surveys are sufficient to create large ranges, where the whale's behavior will be disturbed, potentially leading to other serious outcomes.
- The noise from the vessel survey devices is not likely to cause permanent hearing damage to whales in the vicinity, so that damage would not show up on post-mortem examinations even if it was looked for, which often it is not.
- **The situation calls for a prompt, serious and transparent investigation by those with the skills and independence to reach fact-based conclusions.**

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Response to Vessel Survey Issue from the federal agencies and wind energy proponents

- **Hastily concluded there is no "direct" connection between the whale deaths and the vessel surveys, other factors vaguely presented without evidence-climate change, feeding patterns, more vessels, etc. – none of which explains six deaths in a month in NJ .**
- **No presentation of the acoustics math and marine mammal science, noise source levels, large elevated noise range, and whale disturbance.**
- **The issue is with the word "direct", apparently referring to permanent hearing damage, but that is not expected here, and they fail to say that post-mortems rarely look for that anyway.**
- **The problem is with behavior disturbance leading "indirectly" to serious harm and fatality.**
- **Federal response does not address the real disturbance issue –an investigation is still needed.**

Pile Driving – Noise Impact
Background

Foundation Diameter, 49 feet (15 meters), Length, 344 feet

Embedded in Seabed, 200 feet

Strike Rate , 30 per minute

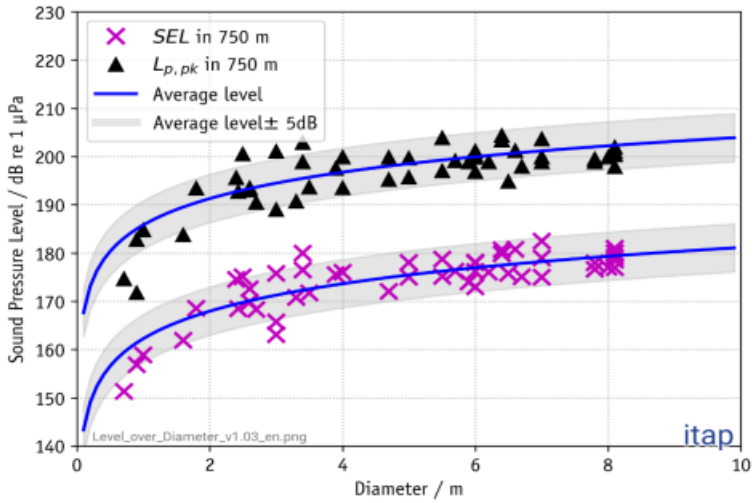
15,387 Strikes to Drive One Pile

Noise Pulse, 15 milli-seconds

Two to three year construction period; Noise Impacts to marine mammals and onshore humans

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Pile Driving – Noise Source Level Increasing with Foundation Diameter



For 12-15m pile diameter, Sound Energy Level (SEL) =182 dB

Adjusted to 1 meter, +43 dB

Adjusted from SEL to SPL ,+18 dB

SPL at 1 m= 243 dB

Pile Driving Impacts
-for 15 meter diameter pile-

	Atlantic Shores Application	Other Sources
Sound Energy Level @ 750 meters	165-170 dB (1a)	184 dB (2)
Sound Pressure Level (SPL), broadband	~ 210 (1b)	~220 (3), ~245 (4)
Transmission Loss (TL)	**40 (5)**	**15 dB (6)**
Distance required to 160-140 dB (no source attenuation)	**4-9 miles (7)**	**6-134 miles (8)**
Broadband Source Attenuation , bubble curtains	10 dB (7)	5 dB (6)
Low Frequency Attenuation, baleen whales	10 dB (7)	0 dB (reverberates from seabed)

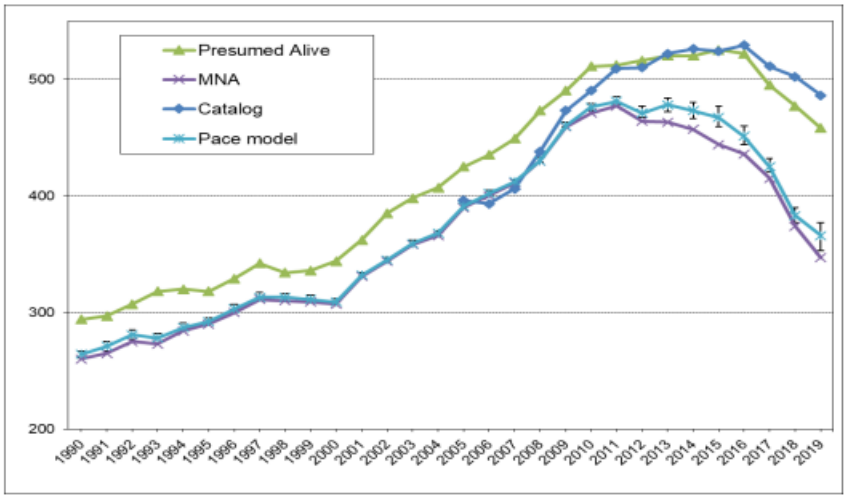
The North Atlantic right whale

- Critically endangered North Atlantic right whale, slaughtered for oils, struggling to survive.
- Current population~350 and declining, 70 breeding age females
- *Recent study indicates human induced stressors are stunting their growth.
  - Scientists have observed 5–10-year-old whales about the size of 2-year-old whales
  - An 11-year-old whale observed was the same size as 1.5-year-old whales
- Current risks include net entanglement, vessel strike.

- New risks: noise from vessel surveys, turbine installation (pile driving), and now from larger turbine operation.
- If human-induced stressors, including noise, are not lowered - the right whales' chances of survival are dim.

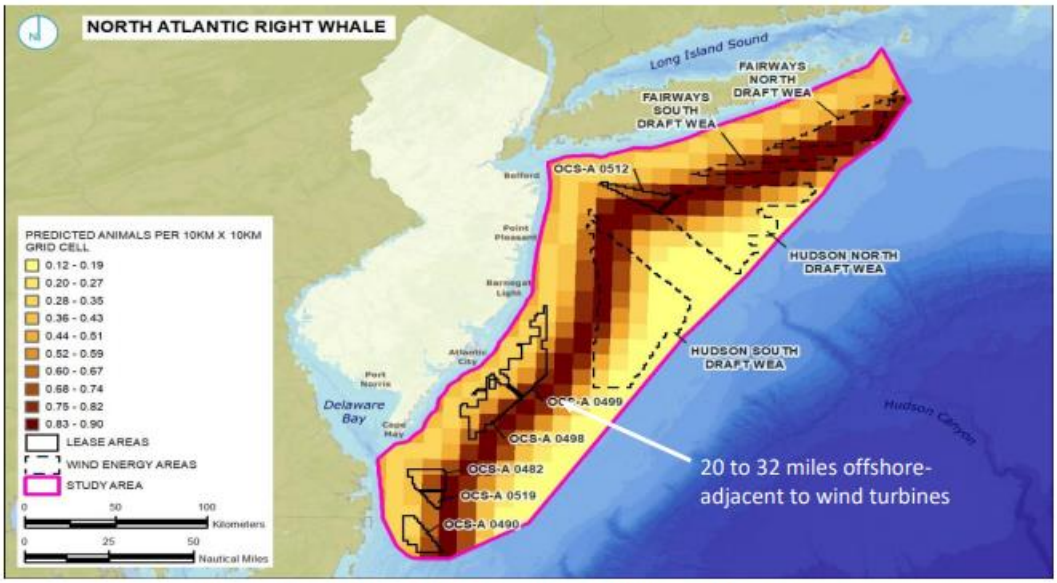
18

Population Decline of the North Atlantic Right Whale



19

Close-in Migration Corridor-North Atlantic right whale



Source, NJ Offshore Wind Strategic Plan, Natural Resource Technical Appendix, Figure 21.

20

Right Whale Migration- from the Atlantic Shores Incidental Take Application for Construction –Figure 9.

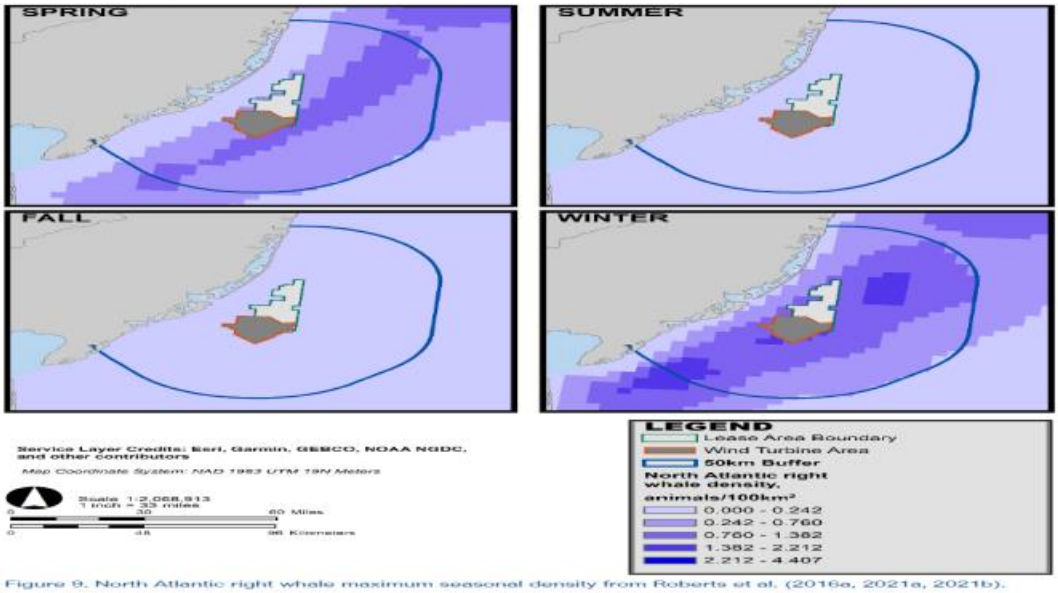
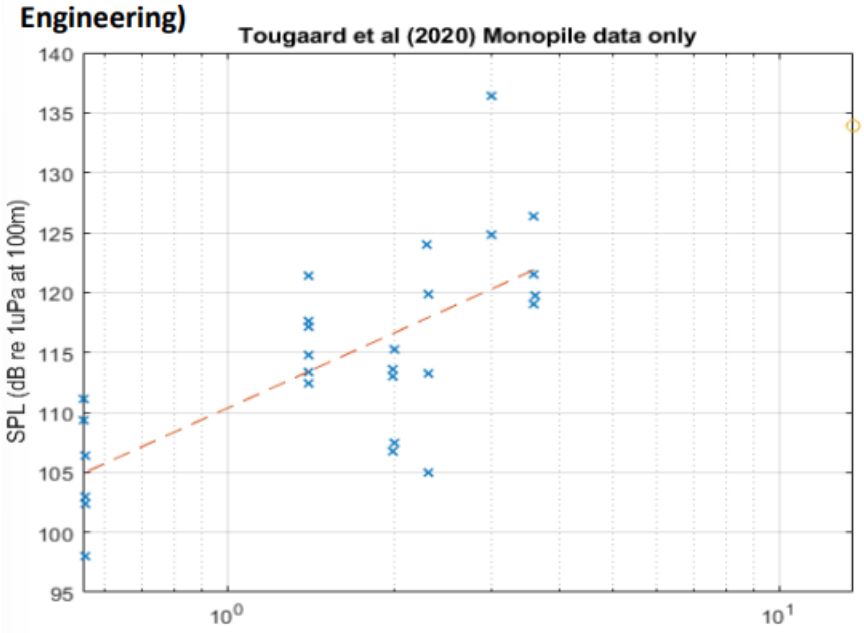


Figure 9. North Atlantic right whale maximum seasonal density from Roberts et al. (2016a, 2021a, 2021b).

Turbine Operation-Increasing Source Noise with Turbine Power-Monopile Foundations (Xi Engineering)

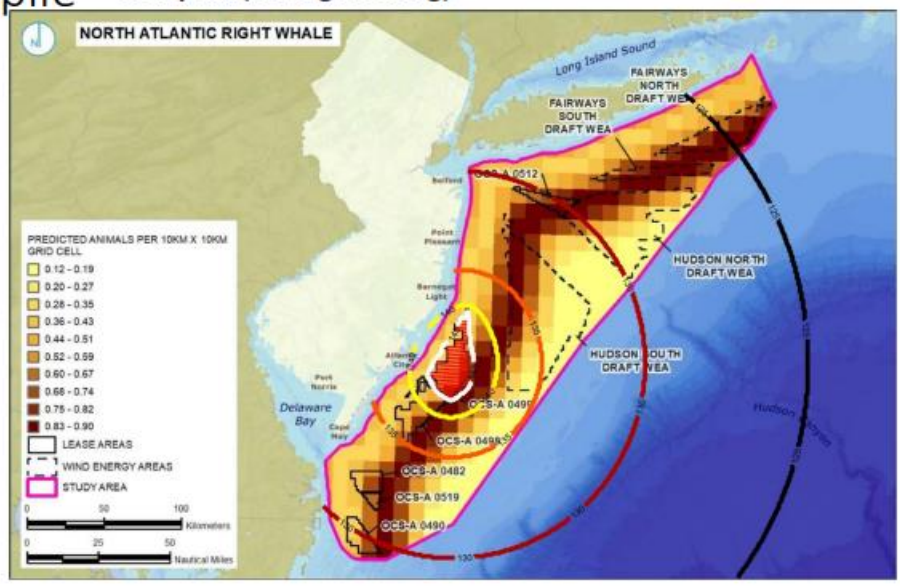


- Data were taken from Tougaard et al (2020) for the monopile foundation only, and the line extended to give source level of a 13.6 MW turbine on monopile foundations.
- A level of 137 dB re 1µPa at 100m was extrapolated, and then back propagated to get a source level of **181 dB re 1µPa at 1m.**
- Both broadband and spectral models were updated with this value and plotted on contour plots.

22

Results Monopile

Noise Level versus Distance from 357 Turbine Complex (Xi-Engineering)



Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

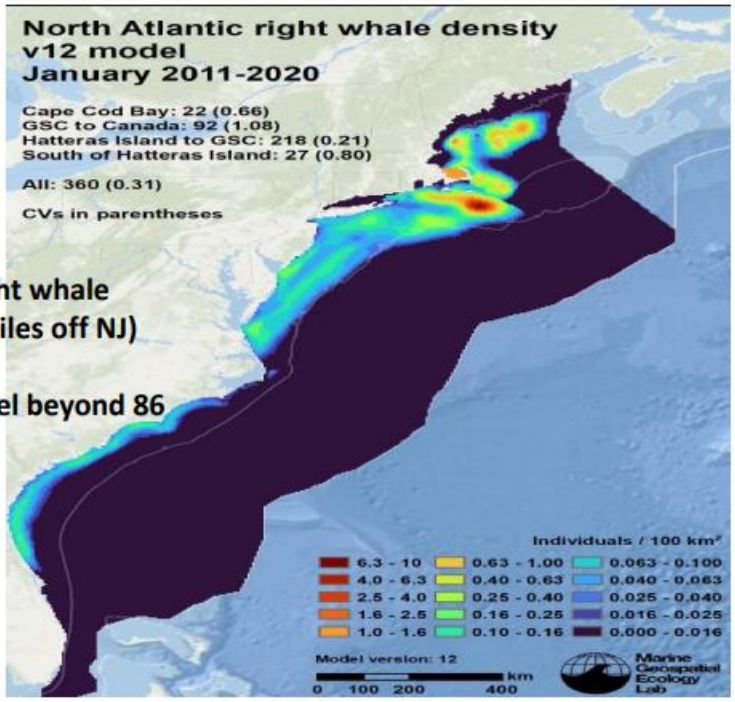
Noise Extent Study Results

- **Noise levels in the 12-mile-wide migration corridor between the Atlantic Shores and NY Bight areas ,140 t0 145 dB, well above the 120 dB NMFS continuous noise disturbance level- more than 100 times the accepted sound intensity level.**
- **Noise levels above 130 dB extend out 93 miles from the shore**
- **From experiments, probability of another baleen whale, the gray whale, avoidance of 140 dB is 95%, of 130 dB, 80%.**
- **Migration not seen beyond 86 miles**
- **Operation noise from the Atlantic Shores project alone potentially blocks the migration.**

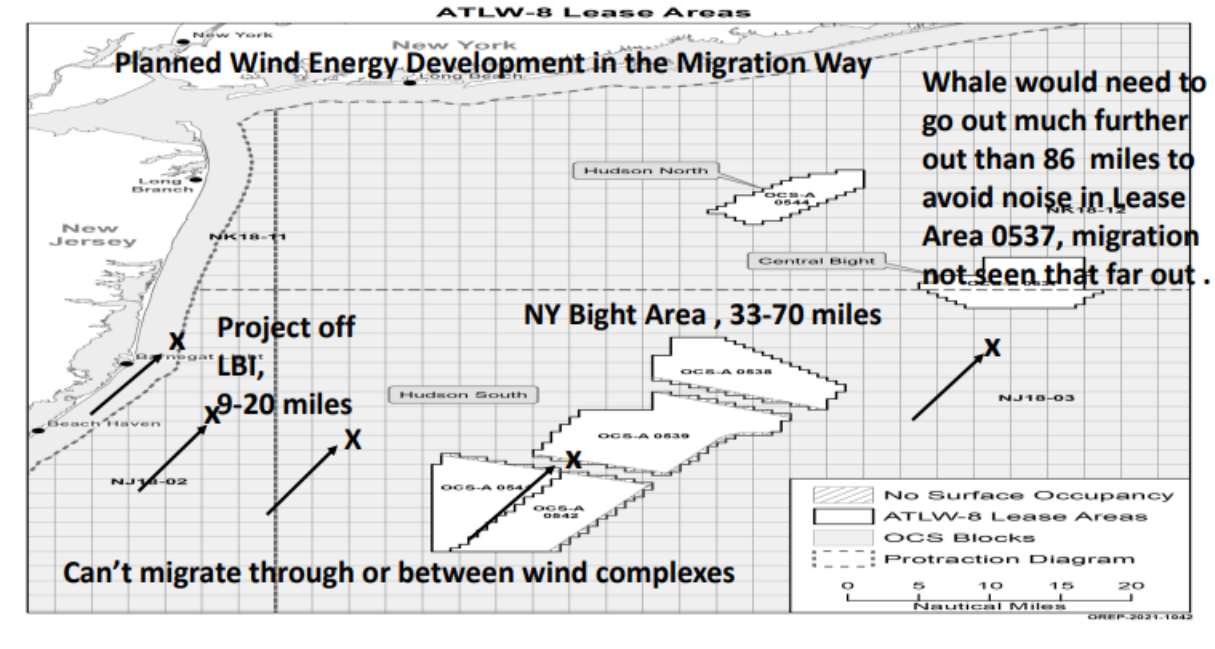
24

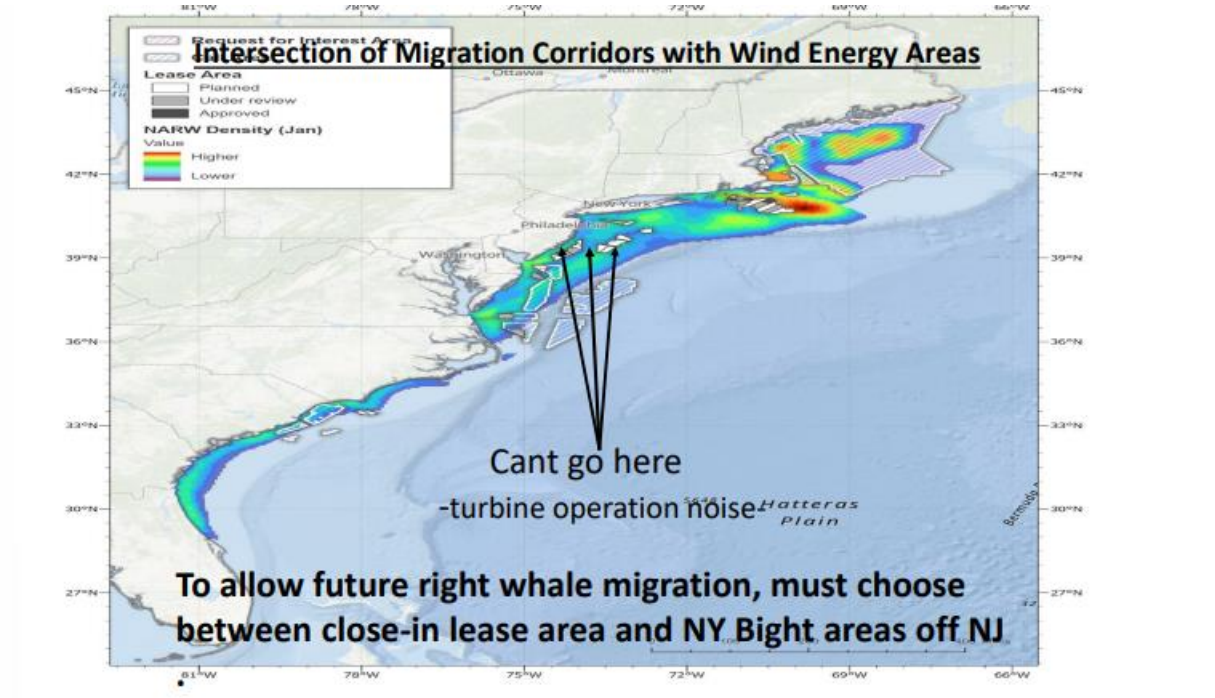
Further look at right whale migration (6-86 miles off NJ)

No significant travel beyond 86 miles



Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**





Conclusions - NJ Project Specific

- To avoid disturbance noise from turbine operation in lease area 0537, whales have to go much farther out than 86 miles to migrate, never seen before. The noise from turbines at 9 miles would block a close to shore path.
- The corridor between the Atlantic Shores project and the Hudson South area will also be blocked by elevated noise levels.
- Even higher noise levels exist within the wind complexes.
- Wind energy development in both the close-in and farther out areas effectively blocks the migration. A choice must be made between the two to leave a path for the whale.
- That choice is evident- there is more wind energy in the further out NY Bight area, and development there does not cause the shore impacts that the closer in area does.

Conclusions – General

- Major issues regarding NOAA "take" authorizations: noise impact estimates, transparency, criteria used.
- Turbine operational noise is crucial, but not being addressed.
- Conflict between right whale migration path and selected turbine areas. Was no public input to selected areas.
- Excessive reliance on acoustic companies paid by applicants, little on independent experts.
- Major risk to marine mammals from the current offshore wind program.
- Congress should hold oversight hearings.

Pile Driving – References

(1a) Atlantic Shores, ITA Application, Appendix B, Tables F1-F12
(1b) Atlantic Shores, ITA Application, Appendix B, Figure 13
(2) Bellman, Underwater noise during percussive pile driving, ITAP report, Figure 12, August 2020
(3) Thompson, Effects of offshore wind farm noise on Marine Mammals and fish, August 2006, Figure 10, 1 meter from source
(4) Adjusted from ITAP, 184 dB, +43 dB to 1 meter, + 18 dB to SPL = 245 dB
(5) ITA Application, Appendix B, Figures F1-F12, and Table 20 in Application
(6) ITA Application, Save LBI comments, November, 2022
(7) ITA Application, Table 20
(8) Using the 220 SPL number and the 15 dB loss factor.

Defend Brigantine Beach INC and Downbeach
P.O Box 562 Brigantine, NJ 08203
defendbrigantinebeach@gmail.com **defendbrigantinebeach.org**

Congressional Hearing

House Transportation and Infrastructure Committee

March 16, 2023

Testimony, Bob Stern, Ph.D.,
President, Save LBI

Thank you, Mr. Chairman and Committee members, for the opportunity to present a very important problem regarding the offshore wind projects.

My name is Bob Stern. I have a background in math and engineering, and previously managed the Office that oversaw the environmental reviews of the federal Department of Energy. In that capacity we reviewed and recommended approval of the Department's environmental impact statements. We also assisted the Department's various programs regarding compliance with a number of environmental statutes such as the Endangered Species Act and Coastal Zone Management Act.

I am currently heading the Save Long Beach Island (LBI), New Jersey organization of over 5,000 supporters. We are not opposed to all offshore wind energy but are very concerned with what we see as ill-informed, biased decision-making, and specific projects in locations that will cause way more harm than good.

I would like to focus on just one topic, noise, to whales and to we humans from these wind energy activities.

The whales rely on noise for everything, including communication. navigation, sensing danger, and finding food. If loud enough, a noise can directly damage the whale's hearing, at lower levels it disturbs their behavior. Disturbance may not sound so bad but it too can lead indirectly to serious harm and fatality, for example, through separation of a mother and calf because their communications are overridden, or by a whale surfacing to lessen the noise while losing its ability to detect and avoid oncoming ships.

Since December, there have been nine whale strandings on the New Jersey coast. This is very unusual given that the annual average is seven. Of the nine, four have been identified as possibly due to vessel strike and noise may be a contributing factor there, with the remaining causes so far unresolved.

The only recent difference offshore that we are aware of are the multiple wind energy vessels using high intensity noise devices to characterize the seabed. We commented a year ago to the National Marine Fisheries Service that the noise source number they were using for the strongest device was too low and the noise dissipation assumed too high, and therefore the affected distance was significantly underestimated. With proper assumptions as shown in Table 1, the elevated noise from that device extends quite far and could affect a significant number of animals.

Given the vessel presence and the noise levels, there is ample reason to suspect that the surveys are a plausible cause of the recent deaths. At a minimum, a thorough, objective, transparent investigation is warranted- that is not asking for much.

Unfortunately, the vessel surveys are just the beginning of the noise problems the whales will face. The noise from pile driving 49-foot diameter steel foundations into the seabed will be intense and require many strikes over a period of several years. Here again, we find an underestimation of impacts as shown in Table 2.

In our view, the worst noise problem of all will come from the operation of the much larger turbines proposed today. We hired a respected acoustics engineering company to assess the noise levels generated from the full wind project proposed off LBI. Based on their results in Figure 1, the noise levels that baleen whales would avoid extend at least 93 miles from shore. With the critically endangered North Atlantic right whale migrating historically within 86 miles, this project could potentially block its migration and seal its fate.

This operational noise problem is not being addressed by the agencies, and that is one reason why we sent a detailed letter to President Biden asking for his personal intervention (Attachment).

What about airborne noise to us? what will we hear? The turbine manufacturer gives a source level for airborne noise of 118 dB which is loud, and noise travels much better over water than over land. We found that the noise at the shore would exceed ambient background levels and therefore be heard. It may also exceed the New Jersey residential night time standard. So here again we have asked our acoustics company to look at this.

If we are right, let's look at what we are facing here. Hundreds of 1000 foot-tall, clearly visible wind turbines, the difficulty of watching the blades rotate (I have to turn away), audible noise at the shore, reduced wind and waves because the turbines are extracting wind energy we normally get, and with that higher local air temperature and humidity. I would suggest that this is not just some mild change in the shore going experience, but rather its destruction.

So where do we go from here? We recommend creation of a Science Board within NOAA with sufficient authority to initially conduct a thorough vessel survey investigation, and then to establish protocols for government-wide use in predicting marine animal impact from noise. Beyond that, this program cries out for some common-sense turbine siting criteria, e.g., a turbine exclusion zone from shore, and excluding turbines from primary whale migration corridors.
Again, I want to thank the Committee for the opportunity to air these issues. It has felt at times a little lonely just trying to present what we believe to be facts and truth, but with the support we see today we don't feel that now.

Bob Stern

Table 1

Vessel Surveys –Noise Impact

	NMFS	Alternate
Source Level	203 dB	205-211
Transmission Loss	20	15
Criteria- Noise Level to Get Down to	160	140 (for baleen whales)
Range to 140 dB	**-----**	**13-34 miles**
Range to 160 dB	**1/10 mile**	**1/2-16 miles**

Table 2

Pile Driving Impacts
-for 15 meter diameter pile-

	Atlantic Shores Application	Other Sources
Sound Energy Level @ 750 meters	165-170 dB [1a]	184 dB [2]
Sound Pressure Level (SPL), broadband	~ 210 [1b]	~220 [3], ~245 [4]
Transmission Loss (TL)	**40 [5]**	**15 dB [6]**
Distance required to 160-140 dB (no source attenuation)	**4-9 miles [7]**	**6-134 miles [8]**
Broadband Source Attenuation , bubble curtains	10 dB [7]	5 dB [6]
Low Frequency Attenuation, baleen whales	10 dB [7]	0 dB (reverberates from seabed)

Figure 1. Continuous Noise Levels versus distance from the full 357 turbine Wind Complex, with monopile foundations. 8 n ineerin ons ltants

XI Engineering Consultants

Results Monopile

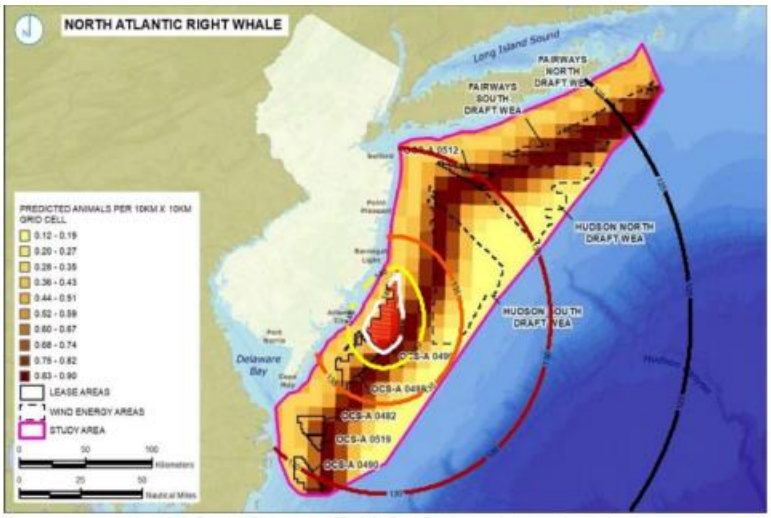


Fig 9- Estimated URN due to source SPL of 181 dB re 1µPa at 1m, spreading loss and attenuation loss