

# Offshore Wind Energy

**Education and Issues to Consider  
For Brigantine, New Jersey Community**

Defend Brigantine Beach, INC  
[www.DefendBrigantineBeach.org](http://www.DefendBrigantineBeach.org)  
[May 2023](#)

## **About Defend Brigantine Beach, INC**

- Non-profit, nonpartisan organization, close to 4,000 supporters, not opposed to green energy solutions.
- Working to protect the prized New Jersey Shore.
- Our mission is to provide services to the community by educating the public on the impacts of alternative wind energy options, current power plant development projects and their impact on the economy, environment, and ecosystems at the Jersey Shore.
- Our goal is to increase the public's awareness and inspire our community members to become active participants in preventing harm to our community.
- This is a service to the community's well-being and long-term existence.

## The Wind Projects Proposed Just Off of Brigantine

- **Four Hundred Fifty Seven 13.6 megawatt (mw) or larger, noisier, gearbox turbines, along the entire coast. Brigantine will be surrounded by three wind turbine projects, Ocean Wind I and Atlantic Shores South and North. Atlantic Shores South will be directly in front of Brigantine.**
- **Ocean Wind I Project will be 15 miles off the coast of Atlantic City and visible to Brigantine. Future Ocean Wind lease area phases show wind turbines 9 miles off the coast of Atlantic City. Atlantic Shores South will be 8.7 miles directly off the coast of Brigantine. Atlantic Shores North will be located north of Brigantine and continue up the coast of Long Beach Island.**
- **Closely spaced, .6-1 mile apart**
- **Up to 1046 feet (3 football fields) high above sea level**

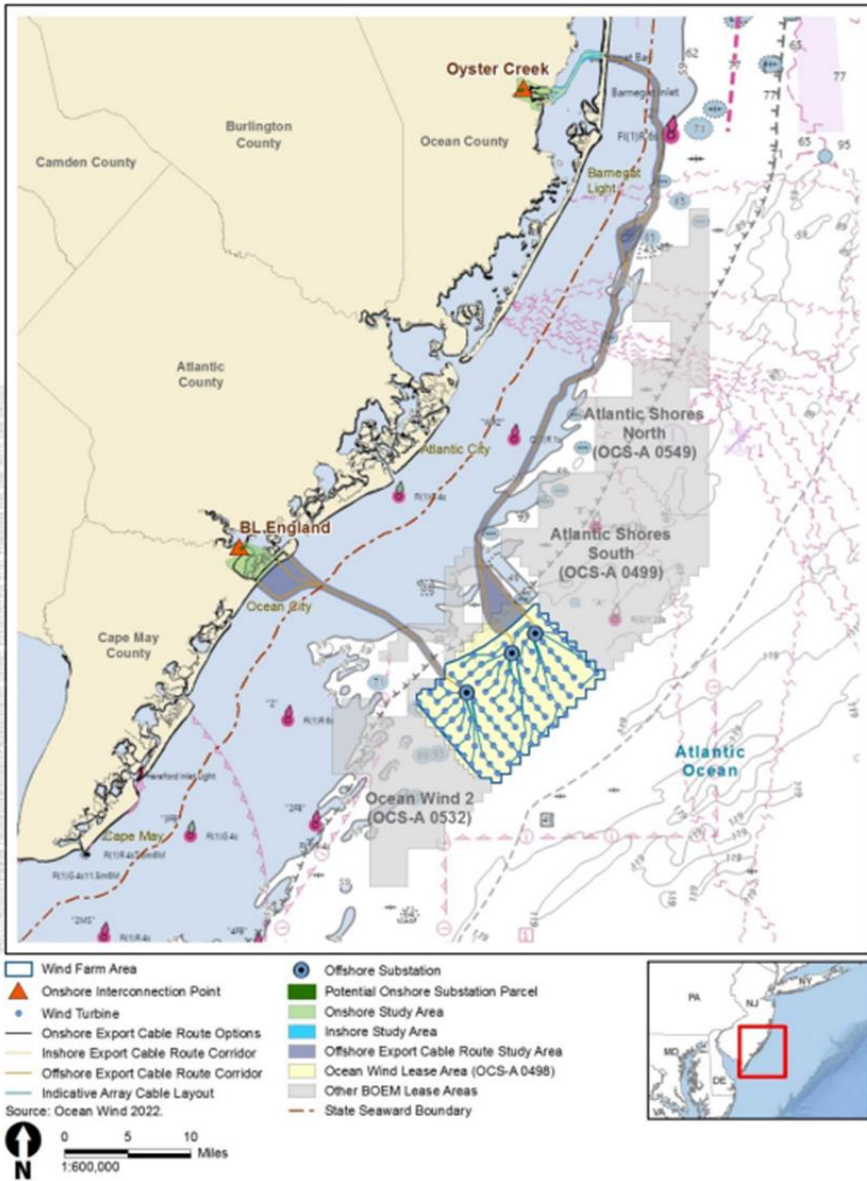
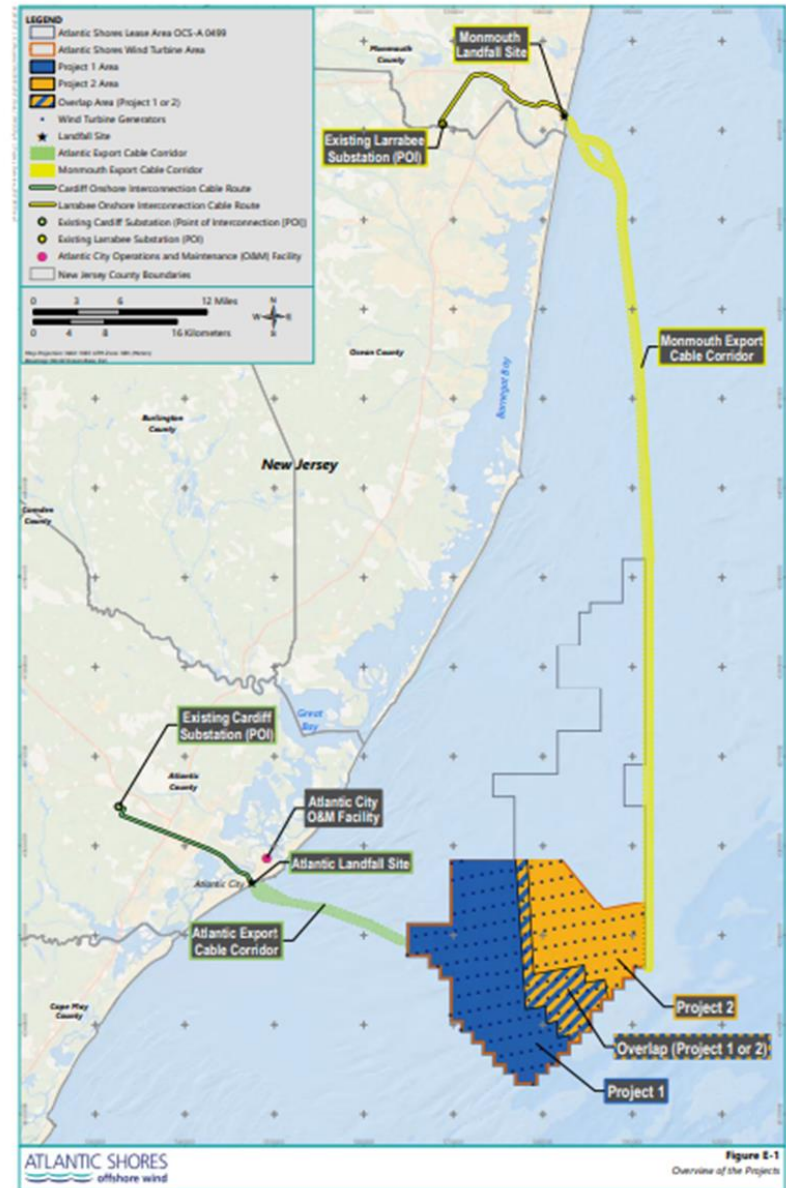
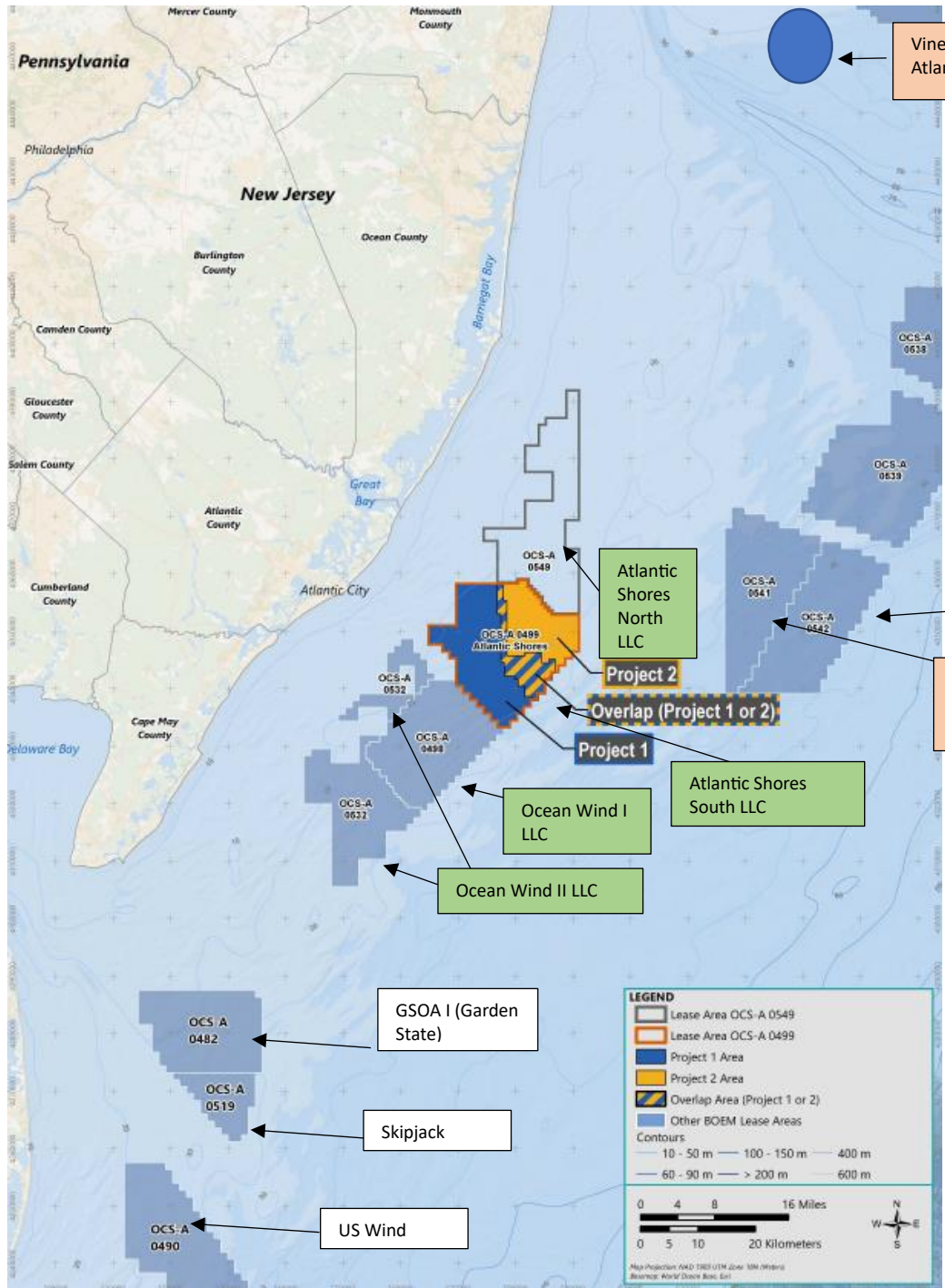


Figure S-1 Ocean Wind 1 Project

## Ocean Wind I



## Atlantic Shores South



**New York Bight**

[Atlantic Shores Offshore Wind \(boem.gov\)](http://boem.gov)  
page 4/224

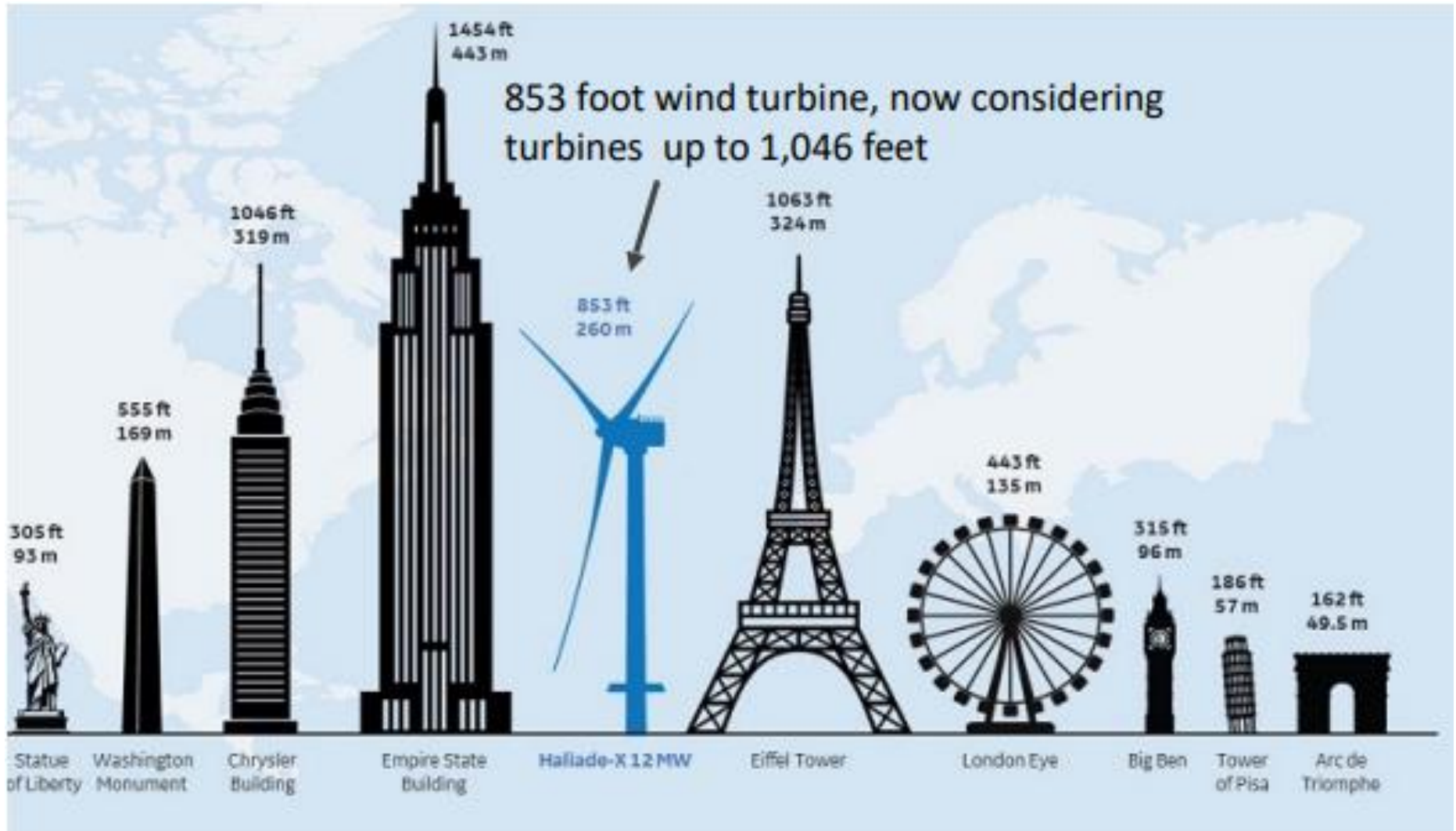
# \$\$\$Lease Information off of New Jersey/New York\$\$\$

November 2015 Lease Sale of NJ Coast Total \$1.89 Million & 3.75 GW						
Company	LLC	\$Millions	Lease #	Power	Acres	Closest Dist from NY/NJ (nmi)
		Sale Price				
RES America Developments, INC (Later, assigned lease to Orsted)	Ocean Wind, LLC (formed by Orsted)	\$0.88	0498	1.1GW (OW1)/ 1.148 GW (OW2)	160,480	NA/9-15
US Wind, INC (Later assigned to EDF Renewable Development, Inc who partnered with Shell Oil)	Atlantic Shores Offshore Wind, LLC (formed by EDF Renewables)	\$1.01	0499	1.5 GW	183,353	NA/9
<a href="https://www.atlanticshoreswind.com/">https://www.atlanticshoreswind.com/</a> <a href="https://us.orsted.com/renewable-energy-solutions/offshore-wind#project-list">https://us.orsted.com/renewable-energy-solutions/offshore-wind#project-list</a> Lease and Grant Information   Bureau of Ocean Energy Management (boem.gov)						

February 2022 NEW YORK Bight Lease Sale: Total \$4.375 Billion & 5.6 GW						
Company	LLC	\$Millions	Lease #	Power	Acres	Closest Dist from NY/NJ (nmi)
		Sale Price				
German RWE Renewables and British Utility National Grid	Bight Wind Holdings, LLC/Community Offshore Wind, LLC	\$1,100	0539	1.387 GW	125,964/ 114,277	56/32
Royal Dutch Shell plc subsidiary, Shell New Energies US LLC, & Electricite de France (EDF) Renewables North America, subsidiary of French utility EDF SA	Mid-Atlantic Offshore Wind LLC/Vineyard Mid=Atlantic, LLC	\$285	0544	523 MW	43,056	20/36
Madrid-based EDP Renewables subsidiary Ocean Winds, French multinational utility Engie SA and independent infrastructure fund manager Global Infrastructure Partners	OW Ocean Winds East, LLC/Bluepoint Wind LLC	\$765	0537	868 MW	71,522	38/53
TotalEnergies Renewables USA LLC (subsidiary of French supermajor TotalEnergies SE) & EnBW America Inc., subsidiary of Germany based Energie Baden-Wurttemberg AG	Attentive Energy, LLC	\$795	0538	964MW	84332/ 79,438	47/36
Royal Dutch Shell plc subsidiary, Shell New Energies US LLC, & Electricite de France (EDF) Renewables North America, subsidiary of French utility EDF SA	Atlantic Shores Offshore Wind Bight, LLC	\$785	0541	924 MW	79,351 /76,139	65/27
Invenergy & energyRE	Invenergy Wind Offshore LLC	\$645	0542	934 MW	83,976/ 76,894	69/35
		\$4,375		5.6GW		
<a href="#">New York Bight   Bureau of Ocean Energy Management (boem.gov)</a> <a href="#">Shell, TotalEnergies, Engie Among High Bidders in New York Bight Offshore Wind Auction - Natural Gas Intelligence</a>						



# Comparisons of Wind Turbine Size



# **Modern Offshore Wind Projects**

## **Europe vs. the US vs. Brigantine, NJ**

### **Europe:**

**Projects start 40+ miles Offshore, No Visible Shore Impact**

**Largest Complex, U.K., 257 turbines**

**Moderate Size Turbines, Less Marine Mammal and Fishing Impact**

### **US:**

**Starting 9 to 27 Miles Offshore**

**Large Turbines, Greater Marine Mammal and Fishing Impact**

### **Brigantine:**

**Starting 9 miles Offshore**

**457 turbines (Ocean Wind I and Atlantic Shores South and North)**

**Largest, tallest, closest, most visible wind complex in the world**



## Proximity to Coast: Other large turbine projects vs. Brigantine at 8.7 miles

Project name	Location	Country	Distance from coast (miles)
Ocean Wind	Atlantic City, NJ	US	15 (Will be approximately 9 miles in future Ocean Wind Projects)
Vineyard 1	Nantucket, MA	US	15
Skipjack	Ocean City, MD	US	20
Dominion Energy	Virginia	US	27
Cape Wind	Cape Cod, MA	US	5 (cancelled, local opposition)
Humboldt	Eureka, CA	US	21
Morro Bay	San Simeon, CA	US	33
Hornsea 1 and 2		UK	56
Sinan project		S. Korea	80
Dogger Bank -- <b>257 turbines</b>		UK	78
East Anglia 3		UK	43
Changua		Taiwan	23 to 58

The BOEM exclusion zone for New York turbines is 17 miles from their coast. At 8.7 miles from our beaches, Brigantine Project is extreme.

# 2016 Brigantine Master Plan Re-examination Report (2016)

An objective identified from the previous planning documents includes an objective to “implement programs and regulatory controls designed to protect the scenic resources of the community”. Previous actions taken to address this objective include zoning control include building height restrictions and setbacks. A “2016 follow-up” within this section of the report identifies public concern for access to scenic resources: “Another aspect of the planning process has been the desire expressed by local residents for scenic views and resources to be protected and accessible to all. The development of the waterfronts, in particular the back bay areas has provided limited public access to street ends and points of access to the bay visually in many locations.” It also identifies that there is “...an ongoing concern about visual access and scenic corridors on the Island, and there is a continuing desire to renovate some of the less desirable views...” and a need to promote and preserve access to the Bay and Atlantic Ocean. A general goal “to promote a desirable visual environment through creative development techniques and good civic design and arrangements” is made created in the 2016 General Goals and Objectives Statement section. Provisions are made in subsequent sections to respond to this objective and improve the visual environment through changes to building setbacks, height restrictions, and similar measures. However, no additional measures intended to protect or enhance visual access and protecting scenic corridors are proposed.

## The Resilience Plan Element

Became a part of the master plan since two major storm events in 2011 and 2012. The reexamination of the Master Plan includes the Resiliency Action Plan that incorporates actions to protect against flooding, extreme storm events, and sea level rise.

[Appendix II- M1 VIA \(boem.gov\)](#), page 172/599

## **BEACHES AND PRESTINE OCEAN VIEWS ARE OUR LIFE BLOOD IN BRIGANTINE**

- **The major factor of tourism real estate in Atlantic County is its beaches.**
- **Visitors go to beaches for the unbridled nature and to escape their cities and industrialization.**
- **Beautiful Brigantine Beaches featured in the News!**

*US News Travel*, [www.thetravel.com](http://www.thetravel.com), <https://thedigestonline.com>, and *New Jersey Monthly* rate Brigantine in Atlantic County one of the top best beaches in New Jersey. Tourism drives the local economies, and location and view are the primary factors determining housing prices.

[15 Best New Jersey Beaches | U.S. News Travel \(usnews.com\)](https://www.usnews.com/travel/best-beaches/new-jersey)

[https://www.thetravel.com/best-beaches-in-new-jersey/?fbclid=IwAR0sgA02VnNMNTF6MjDTWNZWV\\_8epWmjHDtNHGmvm11kZSkCwIMo7hiVsL4#brigantine-beach](https://www.thetravel.com/best-beaches-in-new-jersey/?fbclid=IwAR0sgA02VnNMNTF6MjDTWNZWV_8epWmjHDtNHGmvm11kZSkCwIMo7hiVsL4#brigantine-beach)

<https://thedigestonline.com/news/9-secret-beaches-in-new-jersey/>

[7 of Our Favorite Hidden Beaches | New Jersey Monthly \(njmonthly.com\)](https://www.njmonthly.com/7-of-our-favorite-hidden-beaches)

# Photo Simulation from Atlantic Shores Wind Developer

[Appendix II- M1 VIA \(boem.gov\)](http://boem.gov), page 172/599



# ***Visual Impact Disaster***

## **Visual Impact Summary from Atlantic Shores Wind Developer Visual Impact Assessment 2022**

### **Description of View from BC02 North Brigantine Natural Area (The view of the turbines will be the same from the entire island)**

“Panel members indicated that the WTG’s (Wind Turbine Generators) become dominant elements in the view. **They reduce the view’s sense of openness and add a large number of built features to what was previously an open, undeveloped ocean view. The presence of the WTGs (Wind Turbine Generators) tends to enclose the view, and adds substantial visual clutter.** This effect is enhanced by the transition of the WTGs an orderly arrangement to stacked alignment when the viewer is looking down a row of aligned WTGs, making them appear disorderly. **The movement of the rotor blades will also attract viewer attention and make the WTGs the focus of this view.**”

Although the visibility and visual dominance of the WTGs is likely to be reduced under more hazy sky conditions, and when lighting conditions reduce WTG contrast with the sky, proximity of the WTGs will allow them to be **visible under most clear sky conditions.** **With the Project in place, this KOP has low to moderate scenic quality. Considering the scale, compatibility, and spatial dominance factors that influenced the visual impact rating at this KOP, panel ratings indicated that the WTGs present severe scale contrast with the ocean (water resources), land use, and user activity.** The panel scores also indicate **that the WTGs are not compatible with water resource, landform, land use, and user activity. The WTGs would become the dominant feature in the seascape when compared to the existing water resources, landform, and user activity.** Consistent with the anticipated compatibility, scale contrast, and spatial dominance impacts associated with the Project, panel members assigned the Project visibility an average VTL of 6 from this KOP.”

[BC02 North Brigantine Natural Area \(boem.gov\)](https://www.boem.gov)

**Passing Ship ,1,143 feet long, 10 miles from shore, overcast,  
Turned vertical , well above the horizon**



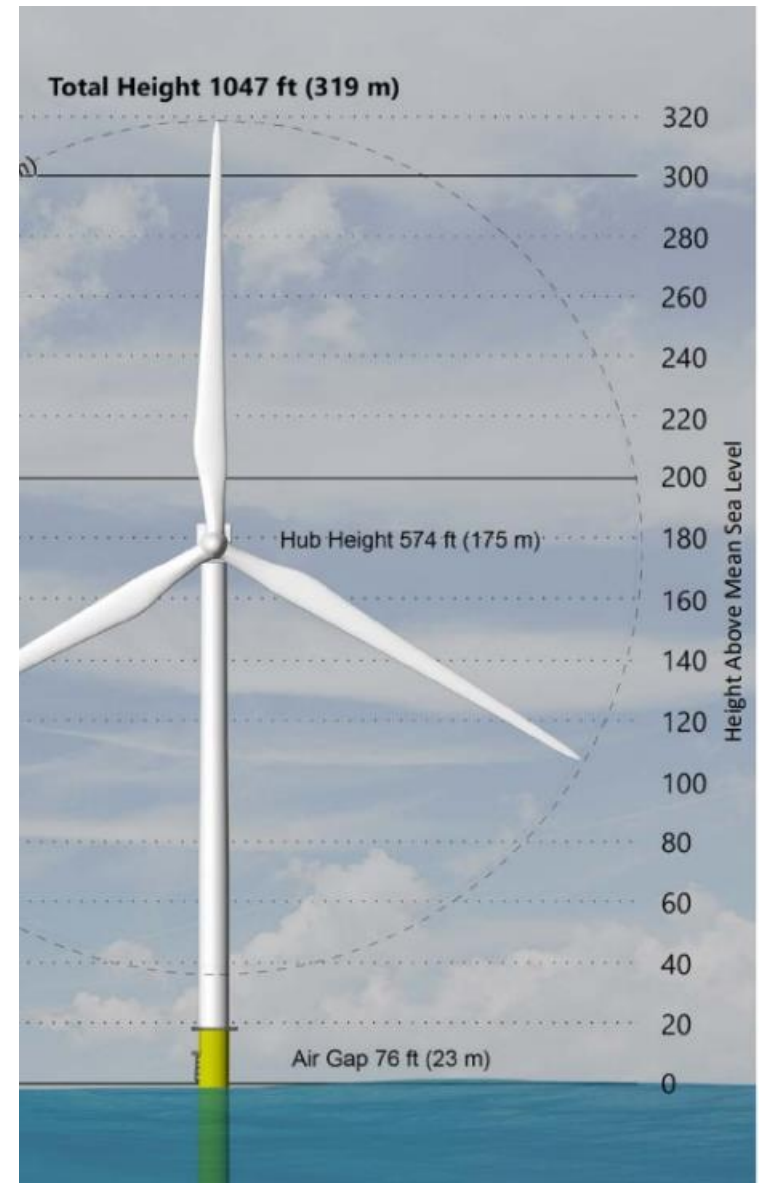


## Visual Impact Based on Views in Real Life!



Looking at a real life example gives a perspective you can see with your own eyes. This picture is from a real estate listing showing the great view of the Verrazano Bridge from a home in Port Monmouth.

Port Monmouth NJ to the Verrazano Bridge is 10 miles over the water. The towers on the bridge are 690 feet tall. The nacelle or hub will be at 575 with the blades reaching over 1000'



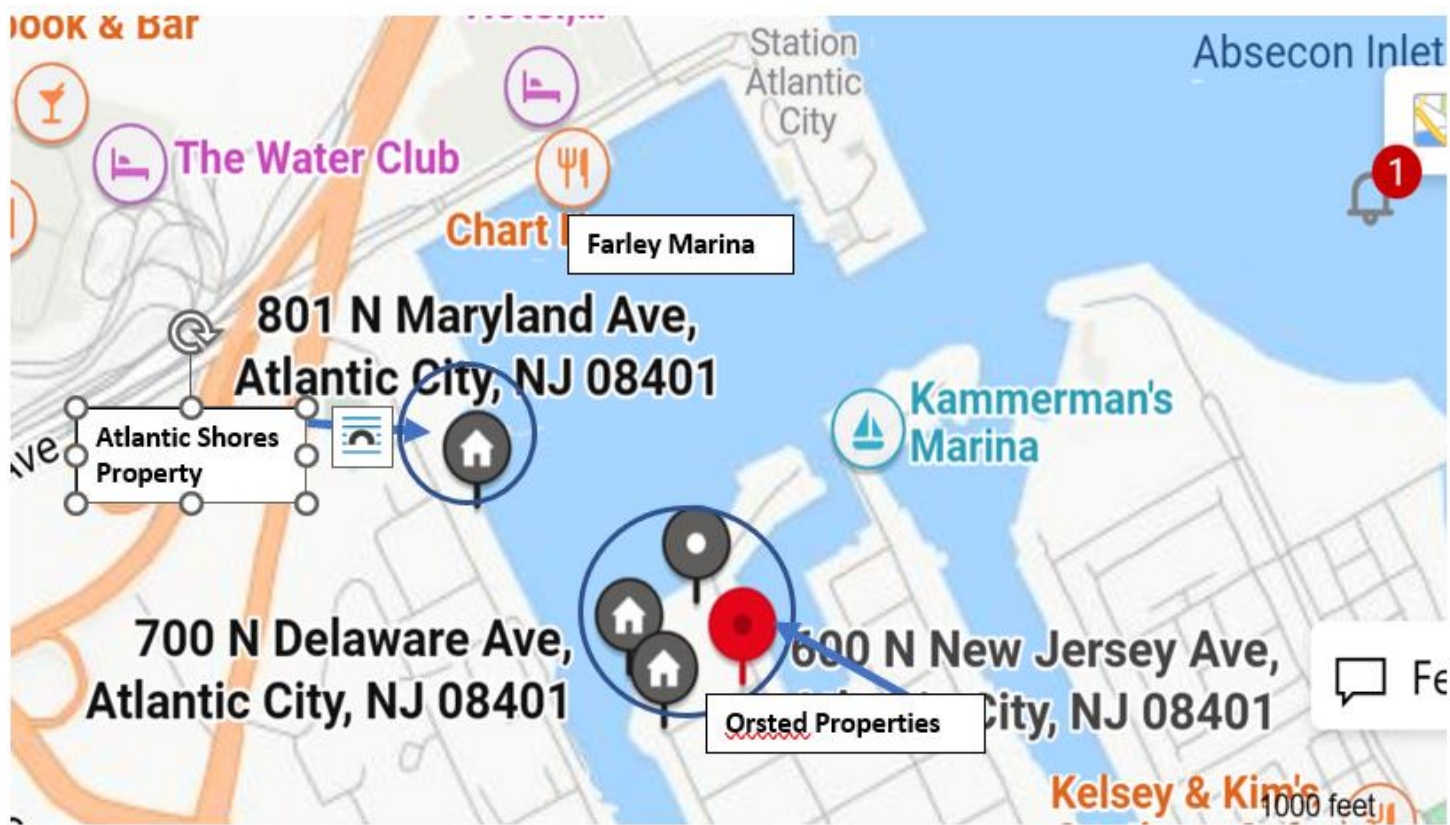
# The Industrialization of the Ocean off of Historic Atlantic City Boardwalk

The famous AC Boardwalk is a national historic treasure built in 1870 with decades of international recognition. The visual aesthetic of the view from the Boardwalk will be destroyed by the wind energy power plant consisting of 400 +, 1,000 foot high wind turbine generators constructed in the ocean starting 8.7 miles off the coast.



# Industrialization of Other Tourist Areas

Example: View from Chart House Restaurant onto Wind Development Maintenance Areas, Added Pollution and Vessel Traffic Interfering with Fairly Marina.





## Impact on Local Economy

- Several Surveys (including BOEM's) of public reaction to visible turbines
- **Rental Demand Loss**: 50% of prior renters would not rent again with turbines visible.
- **Tourism Revenue and Job Losses**: 19% would not visit that beach town, for Atlantic County may lose 12,400 jobs and \$1.3 billion in annual revenue.
- 71% wanted turbines farther out where they can't be seen.
- **Property Value Loss**: \$.2 – \$1.0 million (based on older study, much more based on today's values) for ocean front and ocean view properties, implications for others. Atlantic County Residential RE value loss could be \$2 Billion (10%) to \$ 5.7 Billion (30%). Annual Rental Income loss could be \$17.2 Billion (10%) to \$52 Billion (30%)
- **Potential Commercial fishing loss, Fishing revenues add \$512** million/year, recreational, \$469 million per year to the NJ economy. How will this be impacted during years of construction and operation? Clam



# Effects on Shore Wind Speed, Wave Height, and Local Air Temperature

## Reduced Wind Speed at the Shore

- Small turbines, 7% reduction 6 miles downwind of wind complex
- Large turbines, 26% reduction 9 miles downwind (same distance from shore to turbines here)

## Wave Height Decreases with Wind Speed

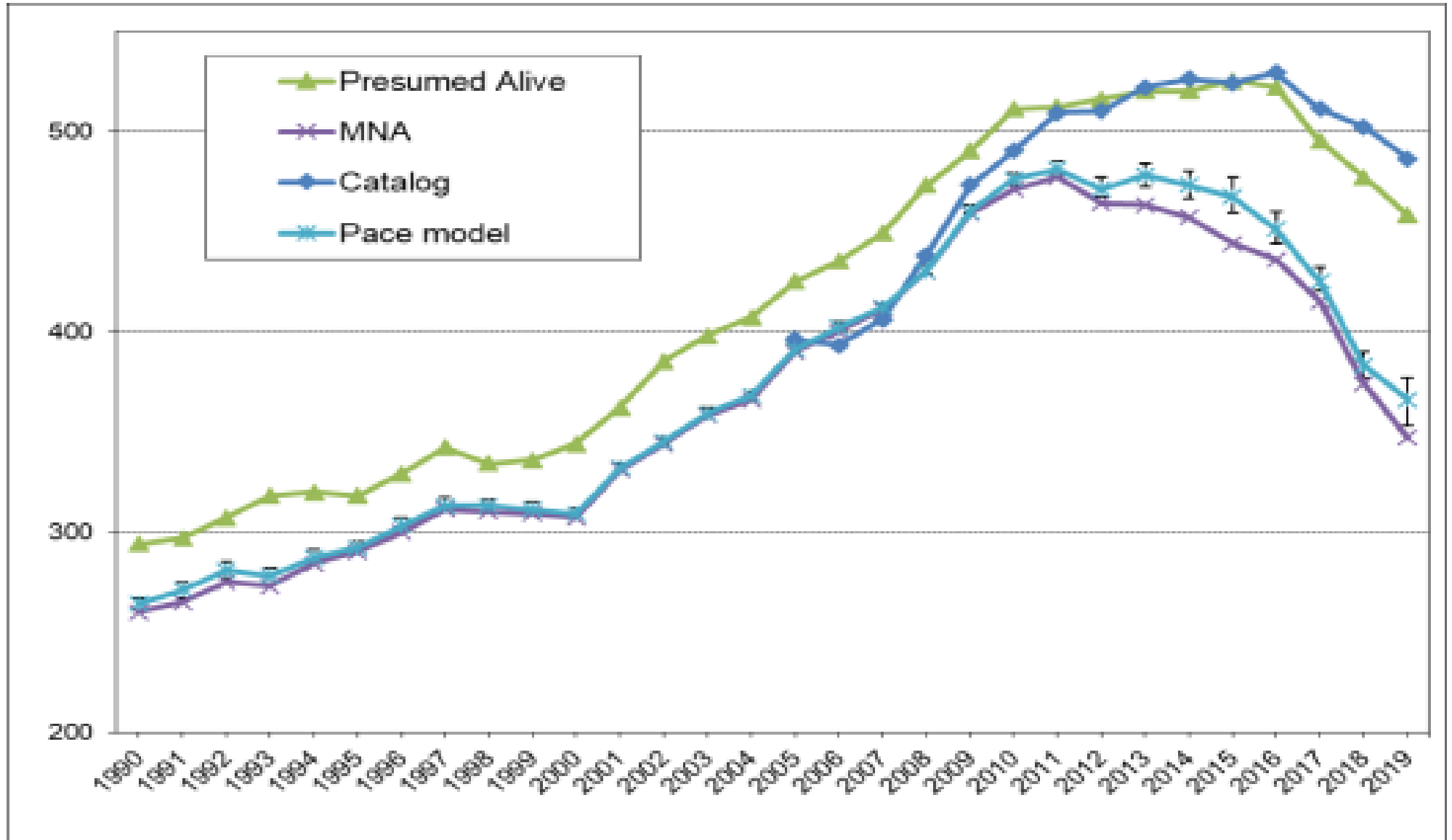
Local Air Temperature Increase: 1.1 degrees 28 miles downwind of moderate size turbines

**Further Degradation of the Shore Experience**

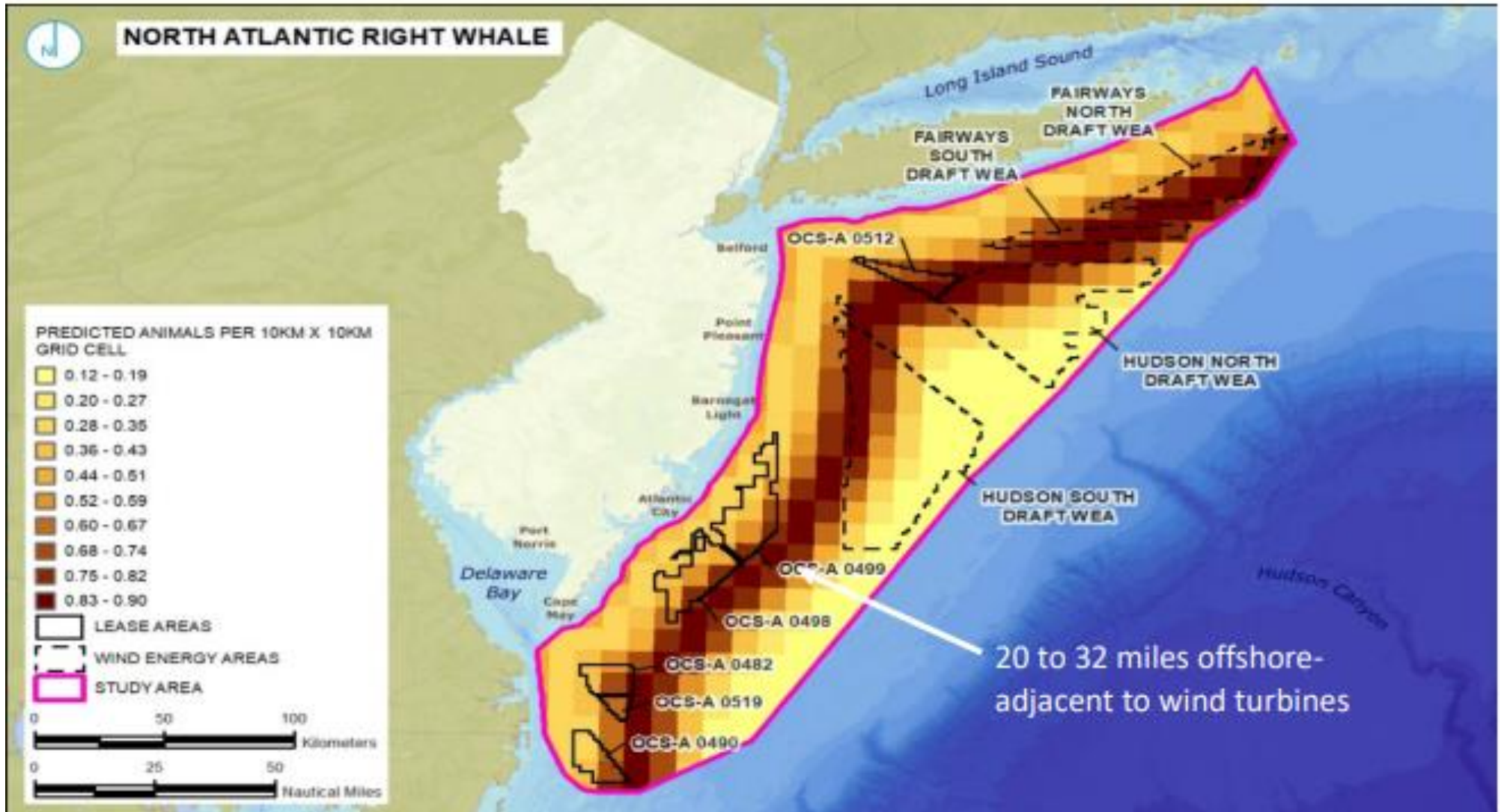


# Marine Mammal Impact-Operational Turbine Noise

## Population Decline of the Critically Endangered North Atlantic Right Whale



# Migration Corridor-North Atlantic Right Whale

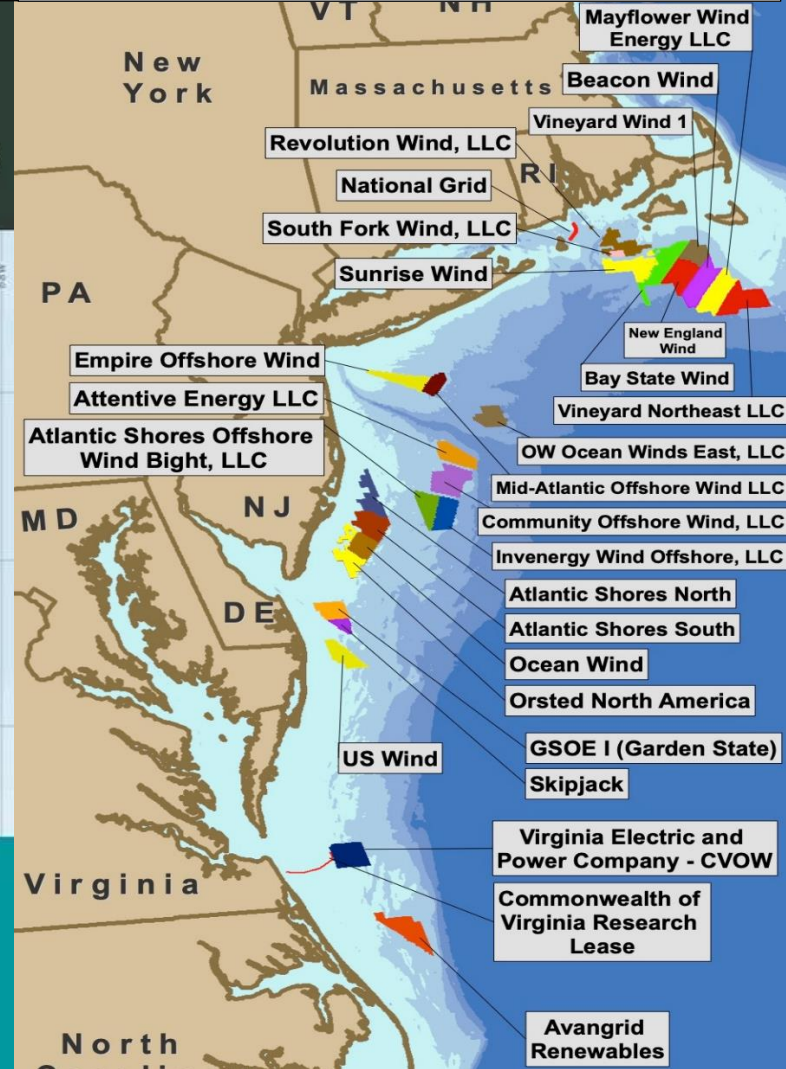


Source, NJ Offshore Wind Strategic Plan, Natural Resource Technical Appendix, Figure 21.

# NOAA Map Shows North Atlantic Right Whales in Very Same Areas Targeted for Offshore Wind Development

NOAA (National Oceanic & Atmospheric Administration), Fisheries Division, 12/30/22 Map Whale Areas from notice  
 “New Right Whale Slow Zone South of Nantucket, MA – Effective Through Jan 13”

BOEM Map, 6/30/22 shows proposed offshore wind projects.



Red Areas = Annual Seasonal Management Area (SMA): 10 knots or less required for boats 65 feet and bigger. These speeds are also recommended for smaller boats.

Yellow Areas = where right whales have been sighted (\* Dynamic Management Area) or heard. Recommended slow down zones for ALL vessels.

If a Slow Zone overlaps with a SMA, mandatory speed reductions are required.

# Increasing Underwater Noise with Turbine Power

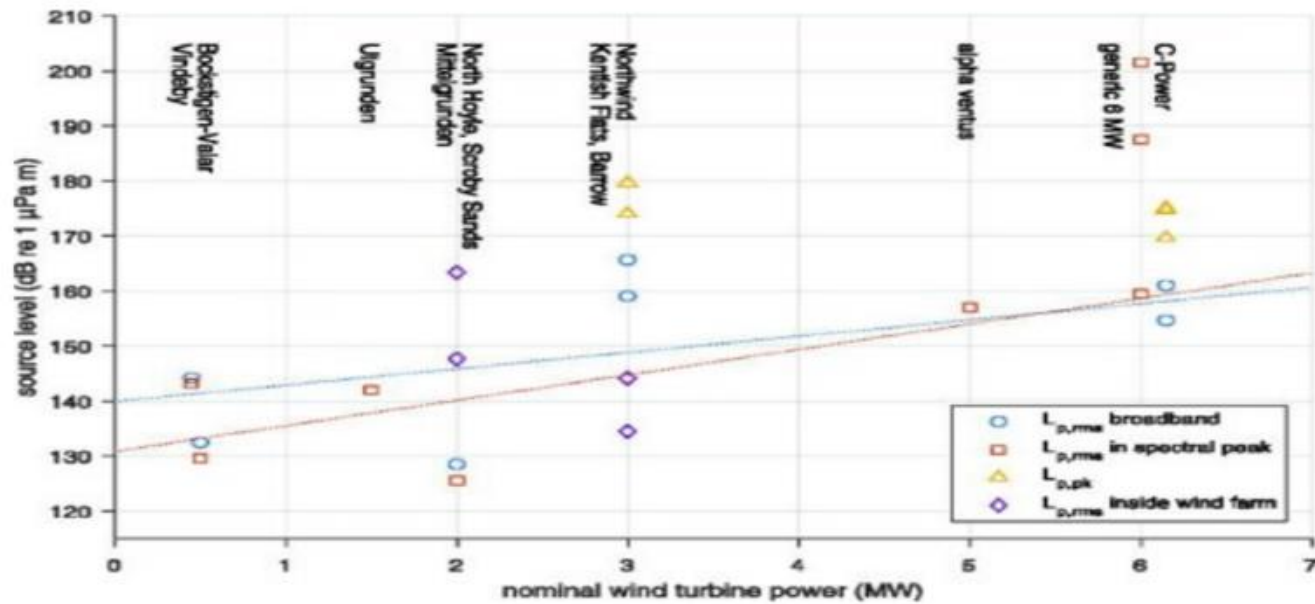


FIG. 1. (Color online) Source SPLs versus nominal wind turbine power as listed in Table I. The names of wind farms or the data source are indicated at the top of the figure. Regression lines for broadband levels (blue) and sound levels at spectral peaks (red) show the increasing trend.

a source are indicated at the top of the figure. Regression lines



# Impact of Continuous, Operational Turbine Noise on the North Atlantic Right Whale **Cannot Be Mitigated!**

## Primary Migration Corridor Potentially Blocked By Underwater Turbine Noise

- Corridor is 12 miles wide just off the lease area.
- Requires 22 miles for noise from 13.6 megawatt gearbox turbines to comedown to the NMFS level of 120 decibels (dB) to not disturb the whale.
- Noise levels therefore will exceed that throughout the entire 12-miles corridor, potentially blocking migration.
- Responsible Offshore Development Alliance (RODA) lawsuit related to Vineyard Wind Offshore Development 15 miles off the Massachusetts coast against NOAA claims the agency has violated Outer Continental Shelf Lands Act, National Environmental Policy Act, Clean Water Act, Endangered Species Act, Marine Mammal Protection Act, Merchant Marine Act and Administrative Procedure Act.
- NOAA ignored Sean Hayes, Chief of Projected Species Branch at the NOAA's National Northeast Fisheries Science Center, "oceanographic impacts from installed and operating turbines **cannot be mitigated** for the 30-year lifespan of project, unless they are decommissioned."

## Right Whales: See them yourself:



<https://youtube/byElUwZZIWw>

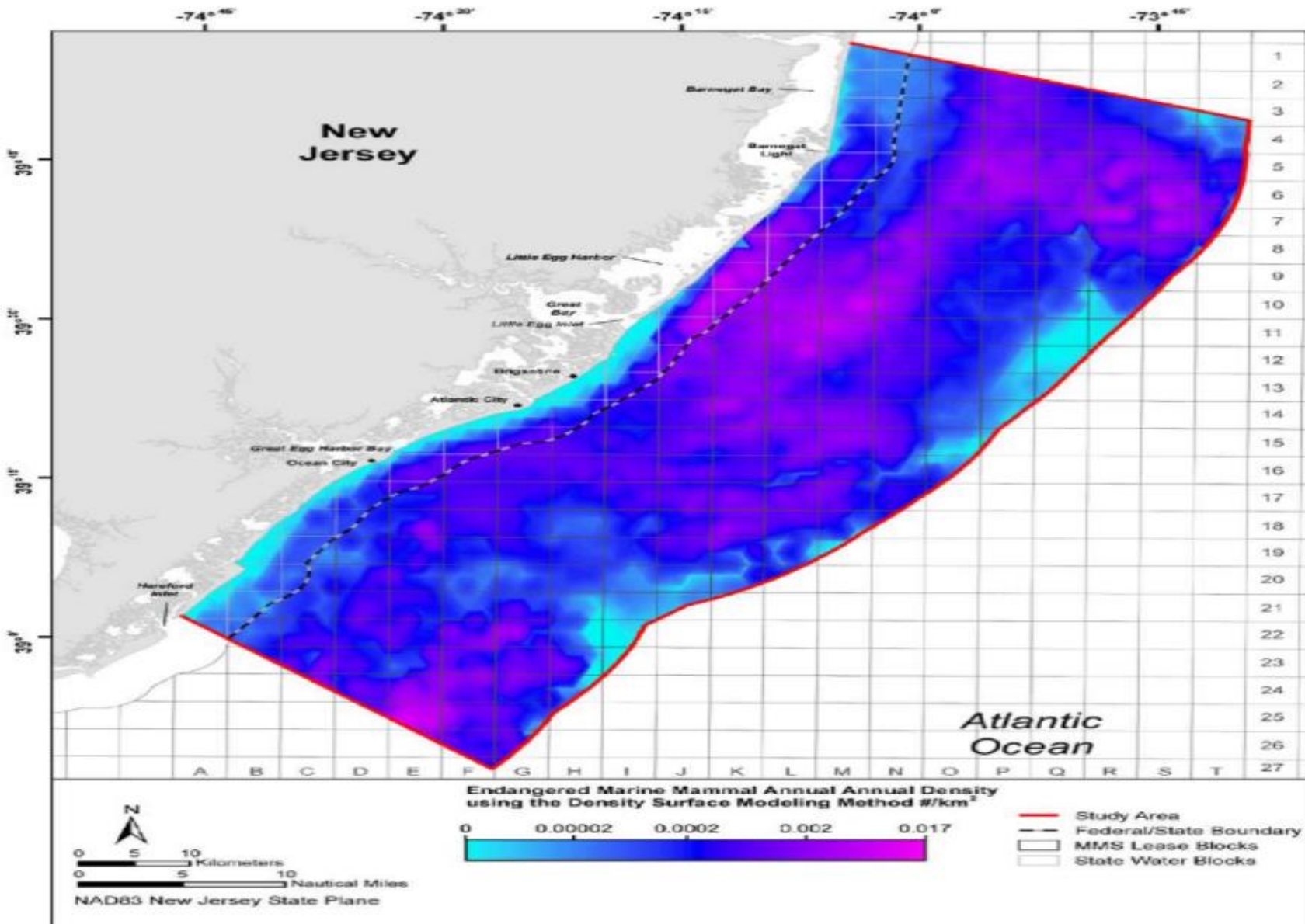


# **Fin and Humpback Whales**

## **Potentially Driven to Shore by Turbine Noise**



# Fin and Humpback Whale Density



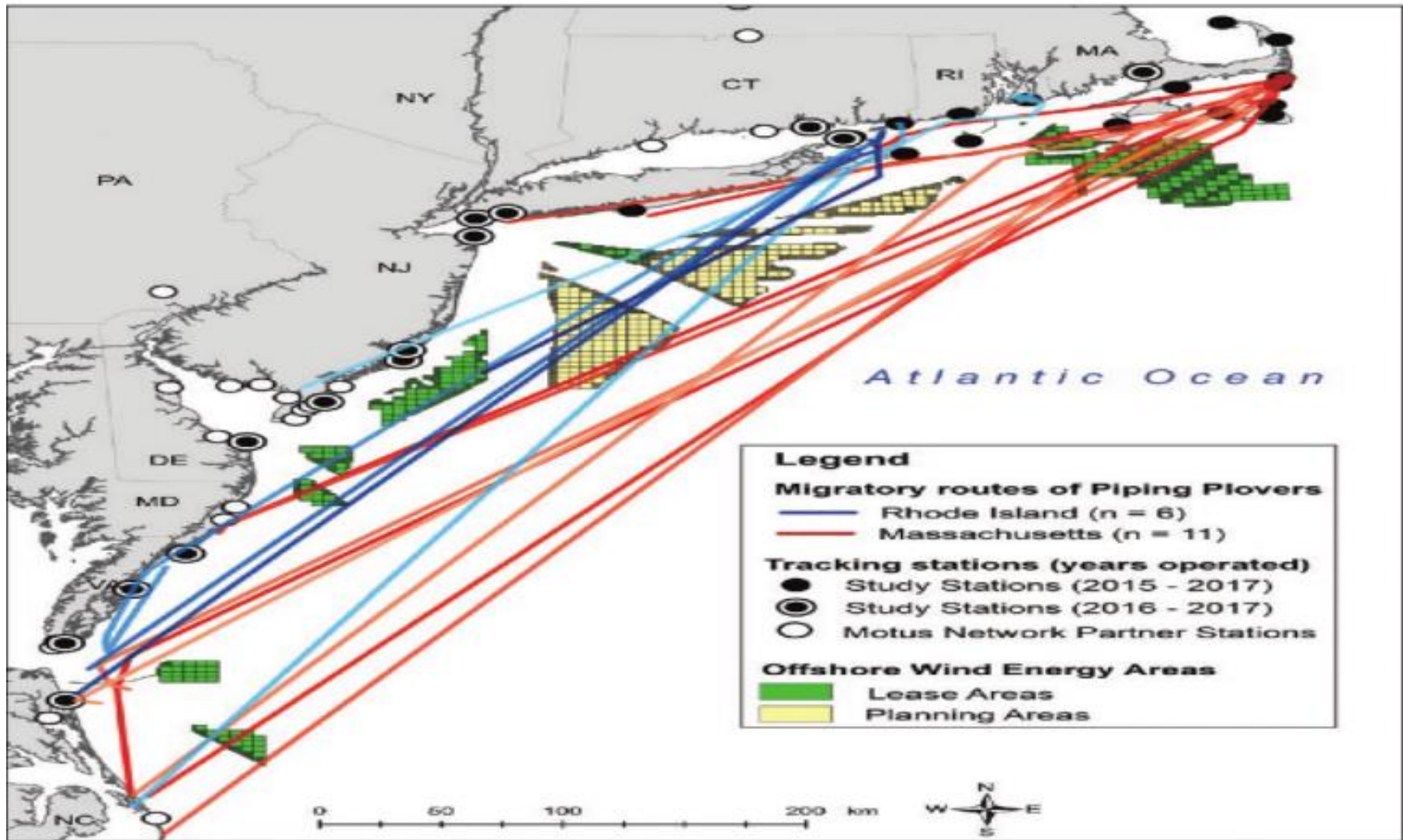
Higher Density = Pink Area

Goes Out to 11 Miles!

## Fin and Humpback Whales

- **Noise from inner rows of turbines at 9 miles out requires 22 miles to dissipate down to the NMFS 120 DB level.**
- **Noise above that level will exist all the way to shore.**
- **Whales may avoid the entire Brigantine area, or**
- **Be driven towards shore trying to escape the noise, with potential for beach stranding.**

# The Piping Plover Crossing the Wind Turbine Complex





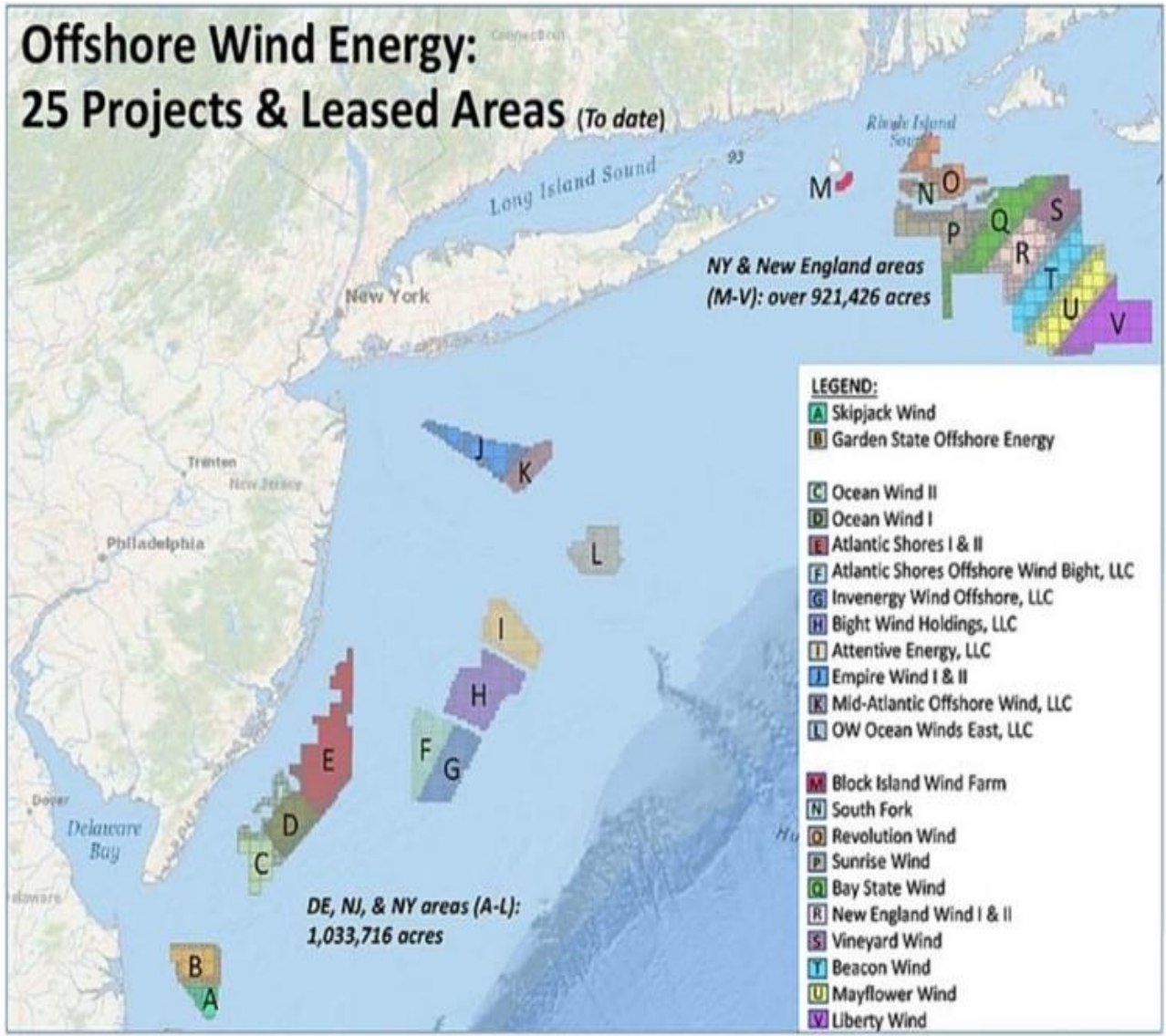
# Impact on the Piping Plover

- Existence “threatened” under the U.S. Endangered Species Act, “endangered” per State law.
- Migrates offshore, north-south <sup>(PP1)</sup>
- Protected plover's nests in Brigantine
- Would have to cross multiple rows of turbines
- Very difficult to avoid rotating blades with 765-foot diameter, turbulent air, and a 200 mph tip speed
- Potential for high fatalities <sup>(PP2)</sup>
  - Estimate: 31% per year\*
  - Unsupported avoidance rates being used
  - Collision models flawed – no aerodynamic effect
  - Potential Conflict with the Endangered Species Act



\*Based on Michelle L. Stantial, Flight Behavior of Breeding Piping Plovers: Implications for Risk of Collision with Wind Turbines, New York College of Environmental Science and Forestry Syracuse, NY, December 2014, Figure 2.25, average of Chapin, Dead Neck, Avalon, Stone Harbor results; also consistent with percent of transit area blocked by rotating blades and 2 lights per bird in and out.

# Potential Impact to the Ability of our Ocean to Clean our Air of CO2

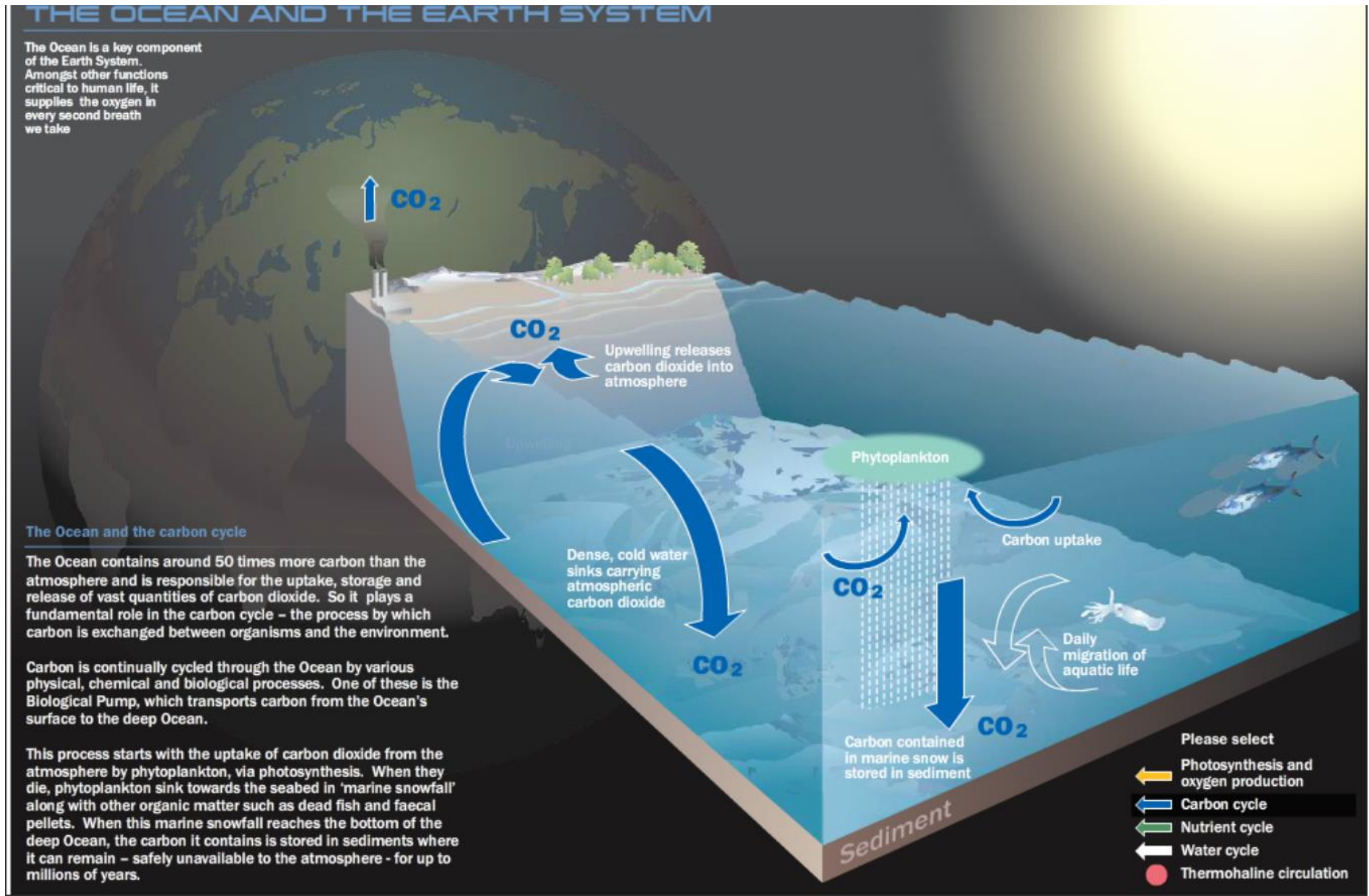


Prepared by Clean Ocean Action, Updated June 2022 Map Source: MARCO

- As of June 2022, planned wind turbines will cover 1 million acres of our ocean’s precious continental shelf on the east coast. As more wind turbine developments get approved this number could more than double.
- The continental shelves on our planet make up less than 10% of the total area of ocean, but it is where all the plants, plankton and marine organisms exist which clean 1/3 to 1/2 of our air of CO2 and produce oxygen.
  - Studies have shown that the wind turbine blade movement will cause changes to downstream turbulence, surface wave energy, currents and surface upwelling which may impact the ocean’s efficiency in cleaning our atmosphere of CO2.



# Delicate Balance of the Ocean's Ecosystem is Vital to our Planet



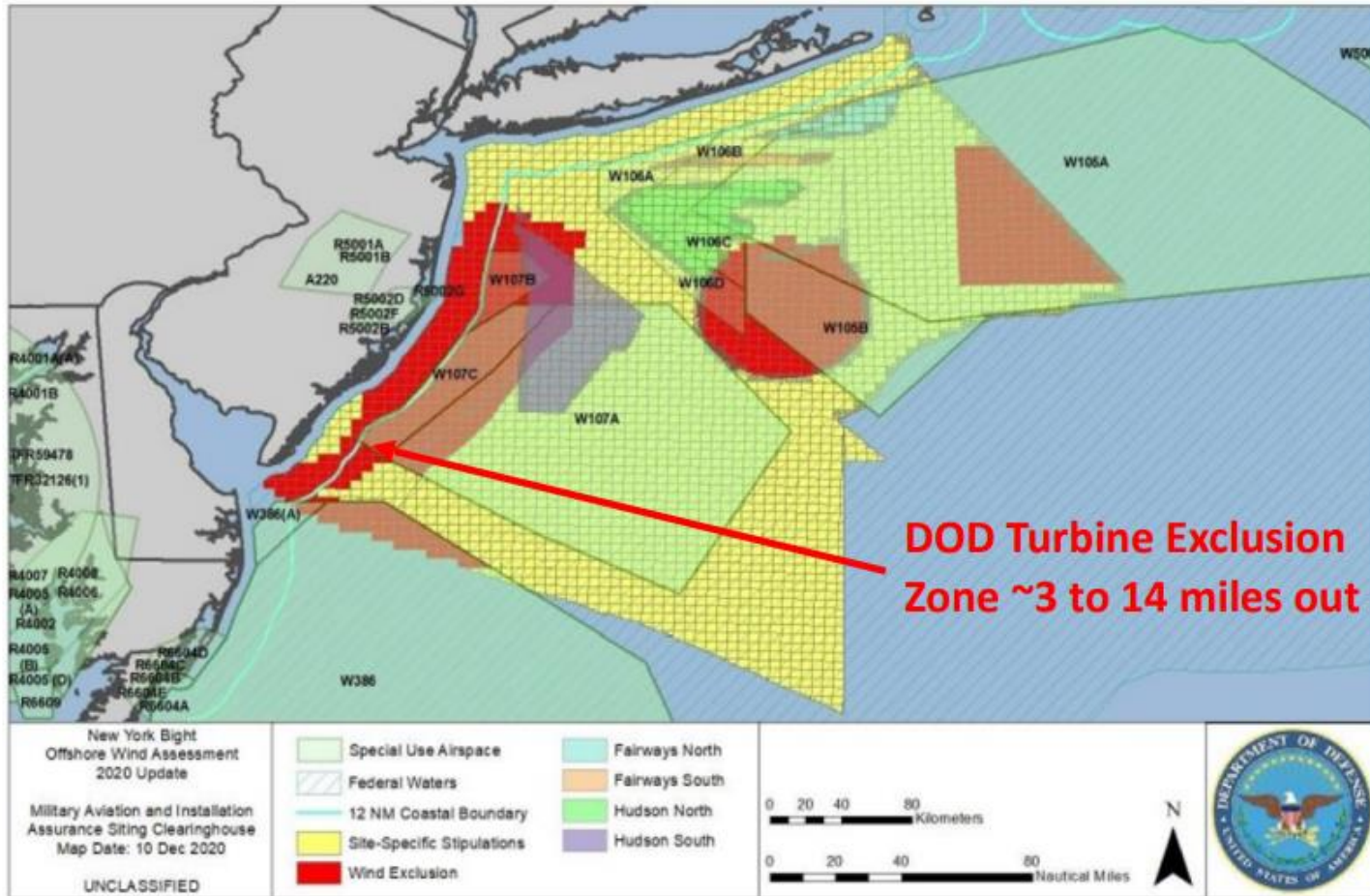
# Potential Conflict with National Security

## Dept of the Navy Assessment



SUSTAINMENT

OASD (Sustainment)



Will Atlantic City lose its annual Air Show Event?

## Impact Summary and Potential Conflict

- **Largest, closest, most visible such project of anywhere in the world, NHPA, CZMA rules**
- **Reduces shore breezes (~26%), waves and increases local LBI air temperature, NEPA**
- **Significant impacts on the local shore economy , CZMA rules**
- **Potentially blocks the migration of a critically endangered whale, ESA, MMPA, NEPA**
- **Drives other endangered whales towards shore, ESA, MMPA, NEPA**
- **Threatens the local piping plover population, ESA, NEPA**
- **In a Department of Defense exclusion zone, OCSLA**

**NHPA(National Historic Preservation Act), CZMA(NJ Coastal Zone Management Rules), ESA(Endangered Species Act), MMPA(Marine Mammal protection Act)), OCSLA (Outer Continental Shelf Lands Act), NEPA (National Environmental Policy Act-EISs**

# Current Public Process- Not Meaningful

## Key federal decisions:

**(1) Turbine Location: -- selected by DEP- led/govt agencies group with limited geographical charge, no alternative area environmental impact statement (EIS) and public input.**

**Lawsuit filed by Save LBI to require an EIS for this decision.**

**(2) Call for leasing sections of turbine area: opportunity for an EIS to look at “reasonably foreseeable” turbine impact and get public input before \$\$\$ committed. Not done, assessment of survey actions only.**

**(3) Specific project approval: EIS with public comment done, but key decisions already made, location, turbine number (state power purchase and applicant plan), and turbine size (largest available).**

**Makes for poor decisions, unsuitable sites, and no meaningful public role**



# What's Coming if We Don't Succeed



**HEAVENSCAPE**



**WHICH DO YOU CHOOSE?**

**HELLSCAPE**

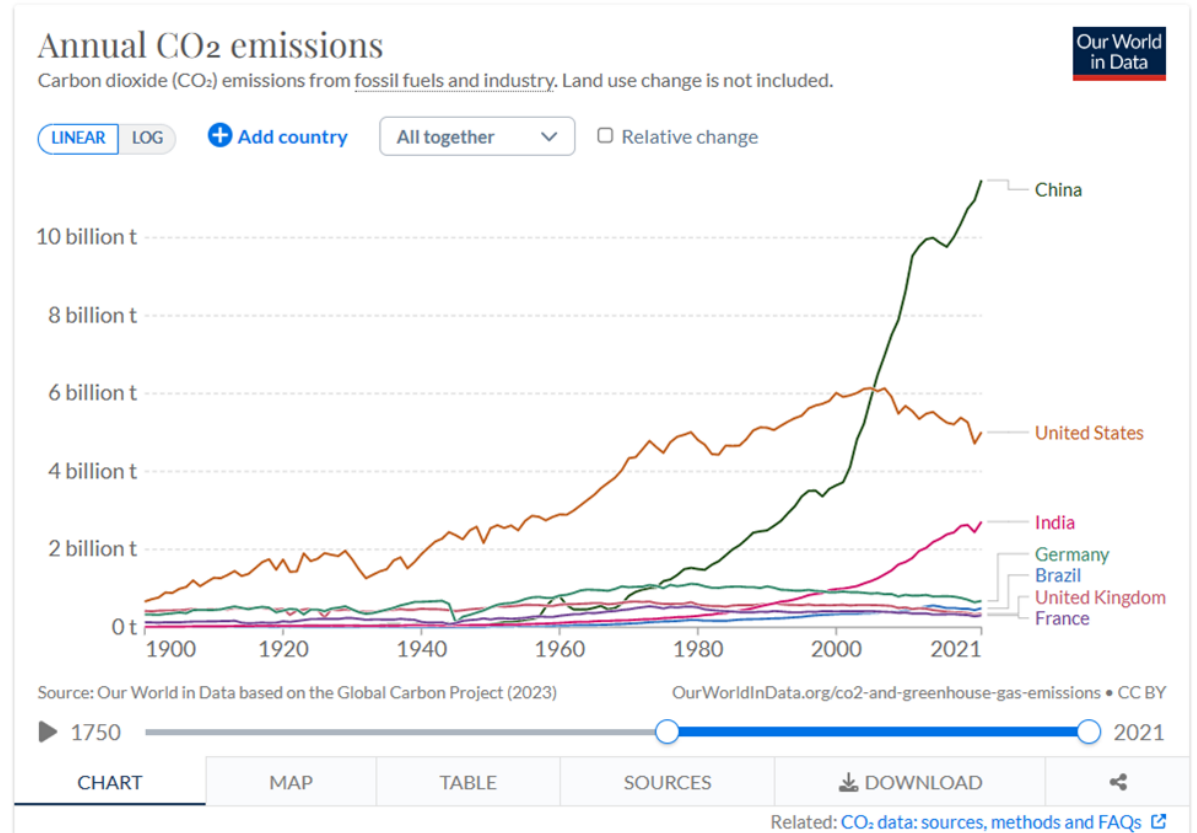


imgflip.com



# Will the Offshore Wind Project Solve Our Problems at the Jersey Coastal Towns?

- Do You Believe CO2 Emissions Cause Climate Change?
- The Impact of CO2 Emissions in China and the Rest of the World is Global.
- Our Ocean will continue to rise, flooding will continue, and our severe weather events will persist on the NJ Coast.



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<https://epis.boem.gov/final%20reports/5662.pdf>

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<https://www.boem.gov/renewable-energy/state-activities/renewable-energy-viewshed-analysis-and-visualization-simulation>

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[Federal Register :: Commercial Leasing for Wind Power on the Outer Continental Shelf in the New York Bight-Call for Information and Nominations](#)

V6. [The Official Website of City of Atlantic City, NJ - About Atlantic City \(acnj.gov\)](#)

V7. Economic Impact of Tourism Industry 2021 by Tourism Economics (www.toursimeconomics.com) prepared for VisitNJ

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<https://www.njcleanenergy.com/renewable-energy/programs/nj-offshore-wind/strategic-plan>

W2. Uwe Stober and Frank Thomsen, How could operational underwater sound from future offshore wind turbines impact marine life? The

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W4. Madsen et al., Wind turbine underwater noise and marine mammals: implications of current knowledge and data needs, Marine Ecology

Progress Series, Vol 309:279-295, 2006 <https://www.int-res.com/articles/meps2006/309/m309p279.pdf>

W5. Nowacek et al., North Atlantic right Whales ignore ships but respond to alerting stimuli, The Royal Society, May 20, 2003. <http://myweb.facstaff.wvu.edu/shulld/ESCI%20432/Nowacek2004.pdf>

W6. Van Der Hoop et al., Foraging Rates of ram-filtering North Atlantic right whales, Functional ecology, Volume 33, pages 1290-1306. <https://core.ac.uk/download/pdf/323987541.pdf>

W7.NJDEP, Ocean/Wind Power Ecological Baseline Studies, Volume III, page 5-35, marine mammals, the right, fin and humpback whales [https://www.nj.gov/dep/dsr/ocean-wind/Ocean%20Wind%20Power%20Ecological%20Baseline%20Studies\\_Volume%20Three.pdf](https://www.nj.gov/dep/dsr/ocean-wind/Ocean%20Wind%20Power%20Ecological%20Baseline%20Studies_Volume%20Three.pdf)

## References: Piping Plover

PP1.James D. McLaren,2 Holly F. Goyert, 3 and Peter W. C. Paton , Supportive wind conditions influence offshore movements of Atlantic Coast Piping Plovers during fall migration Pamela H. Loring, American Ornithology.org,

Supportive wind conditions influence offshore movements of Atlantic Coast Piping Plovers during fall migration | Ornithological Applications | Oxford Academic (oup.com) Volume 122, 2020, pp. 1–16 DOI: 10.1093/condor/duaa028,

PP2.Michelle L. Stantial, Flight Behavior of Breeding Piping Plovers: Implications for Risk of Collision with Wind Turbines , New York College of Environmental Science and Forestry Syracuse, New York, Flight Behavior of Breeding Piping Plovers:implications for risk of collision with wind turbines(nj.gov) December 2014

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J1.New Jersey Offshore Wind Strategic Plan, Board of Public Utilities, Appendices, Chapter 6. Supply Chain and Workforce Analysis, Section 6.12, Summary.  
OffshoreWindStrategicPlanBPUAppendices.pdf

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