Offshore Wind Energy

The Project off Long Beach Island, New Jersey,

-Problems

-A Much Better Approach

Save Long Beach Island, Inc.

www.SaveLBI.org

September, 2022

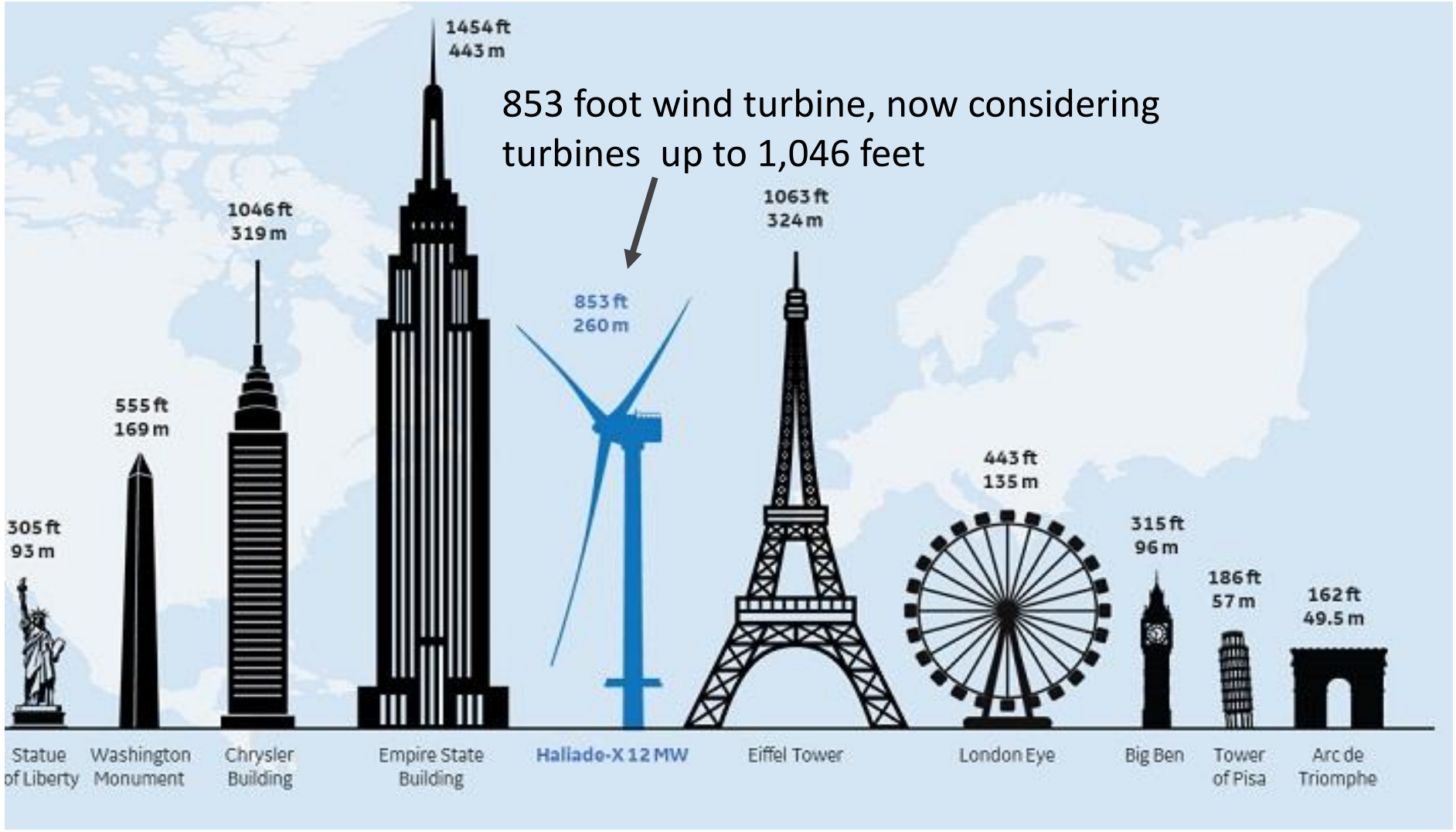
About Save Long Beach Island, Inc.

- **Non-profit, non-partisan organization, 3,700+ supporters, not opposed to wind energy**
- **Working to protect the prized New Jersey Shore by getting turbines sited sensibly.**
- **Specifically, to get turbines placed 35 miles out in the much more desirable "Hudson South" area**

The Wind Project Proposed just off LBI

- Three hundred and fifty-seven 13.6 megawatt(mw) or larger, noisier, gearbox turbines, along the entire 18-mile LBI coast
- Closely spaced, 0.6-1 mile apart
- Up to 1046 feet (three football fields) high above sea level
- Turbine placement, beginning December, 2023?

Comparisons



Modern Offshore Wind Projects

Europe vs. the U.S. vs. Long Beach Island, 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

U.S:

- Starting 9 to 27 Miles Offshore
- Large Turbines, Greater Marine Mammal and Fishing Impact

Long Beach Island:

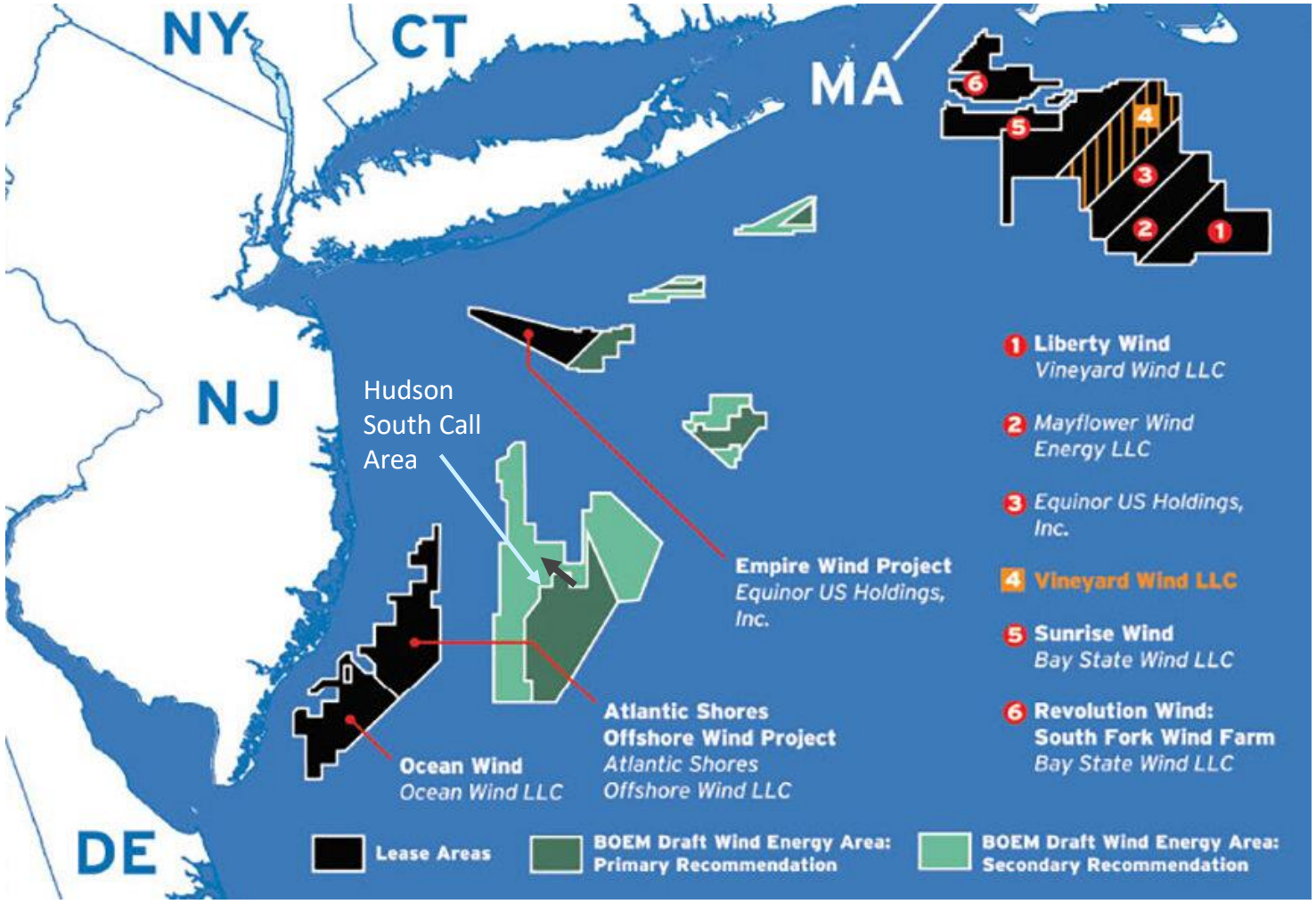
- Starting 9 Miles Offshore
- 357 Turbines
- Largest, tallest, closest, most visible wind complex in the world

Proximity to Coast: Other large turbine projects vs. LBI project at 9 miles

Project name	Location	Country	Distance from coast (miles)
Ocean Wind	Atlantic City, NJ	US	15
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 --**257 turbines**		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 9 miles from our beaches, LBI project is extreme.

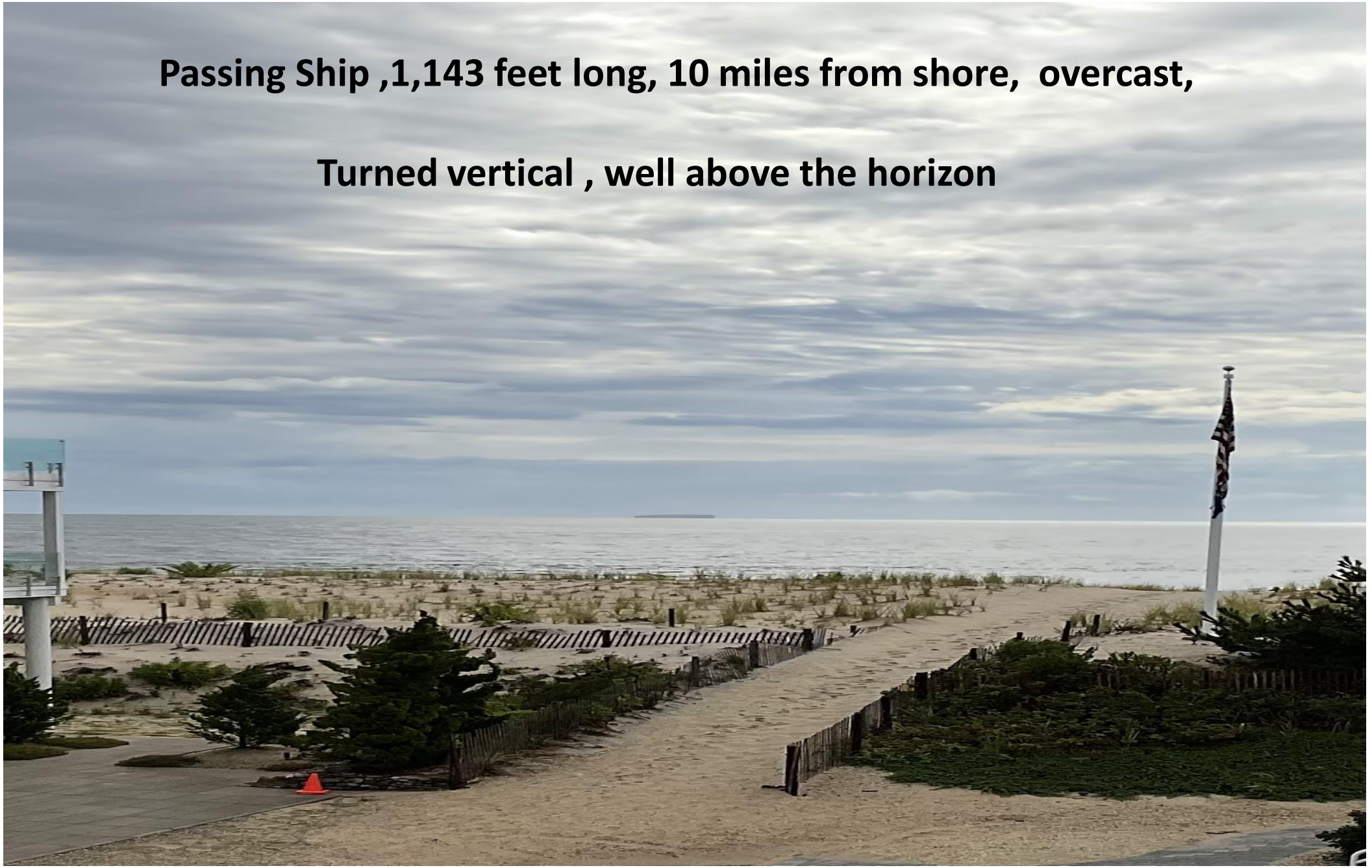
The proposed wind project off LBI (in black) and the farther out Hudson South area (in green).



9 miles to the nearest turbine, Project Construction Plan, Appendix II-M
Hazy condition, similar to what would be seen from LBI, and would be clearer on a sunny day

11.4 miles to the nearest turbine, Project Construction Plan, Appendix II-M

Similar to what would be seen from LBI in hazy conditions- more visible on clear days.


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

Impact on Local Economy

- **Several Surveys (including BOEM's) of public reaction to visible turbines**
- **Rental Demand Loss: fifty percent of prior renters would not rent again with turbines visible.**
- **Tourism Revenue and Jobs Losses: nineteen percent would not visit that beach town, for LBI 1100 jobs lost.**
- **Seventy-one percent wanted turbines farther out where they cant be seen.**
- **Property Value Loss, $0.2-1.0 million (older study, more today) for ocean front and ocean view properties, implications for others**
- **Potential Commercial fishing Loss, $3.5 million per year, recreational, $19 million per year (for both the AS and OW projects)**
- **Survey results are consistent, do not bode well for shore economies.**

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

Reduced Wind Speed at the Shore

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

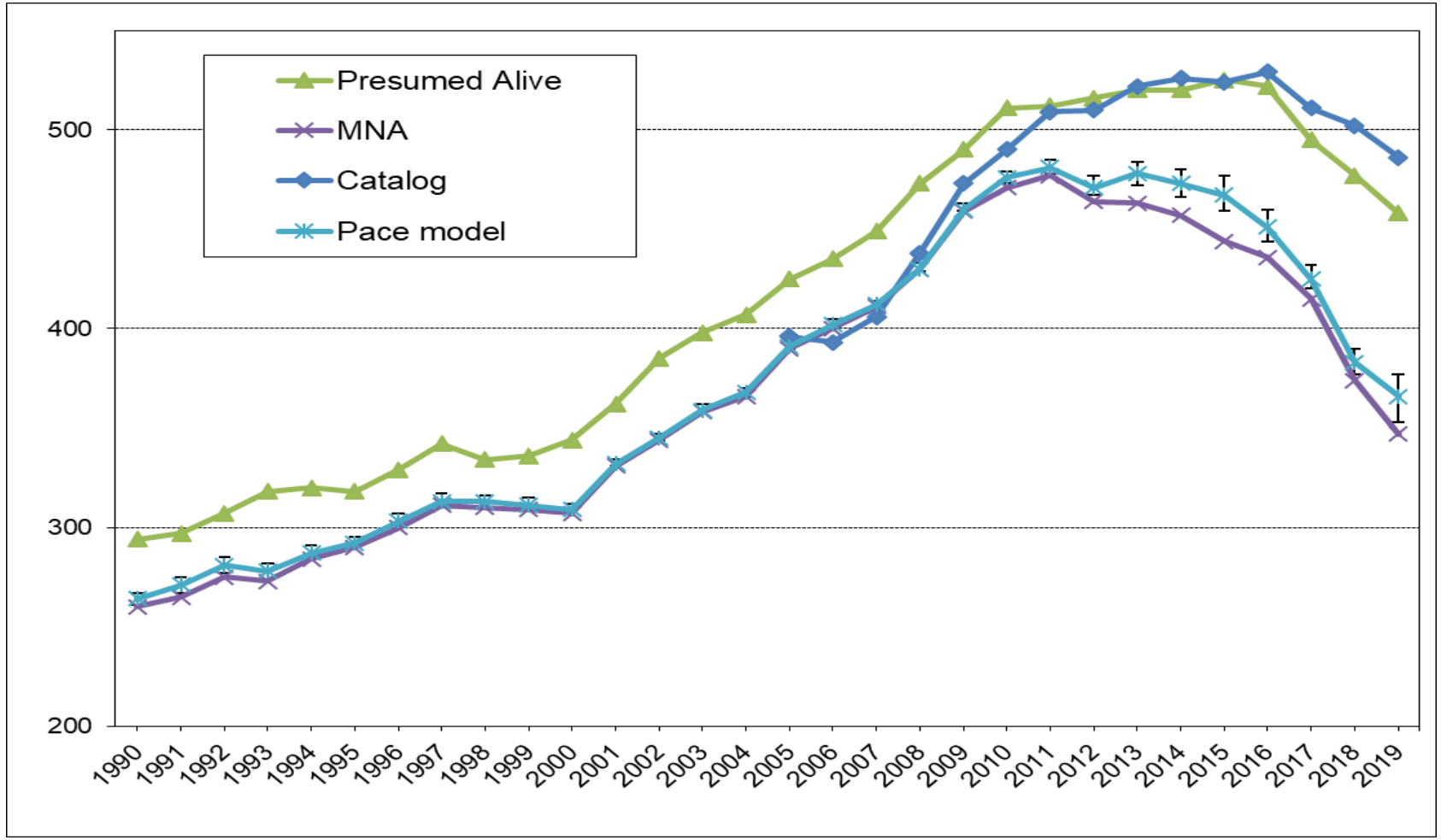
Wave Height Decreases with Wind Speed

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

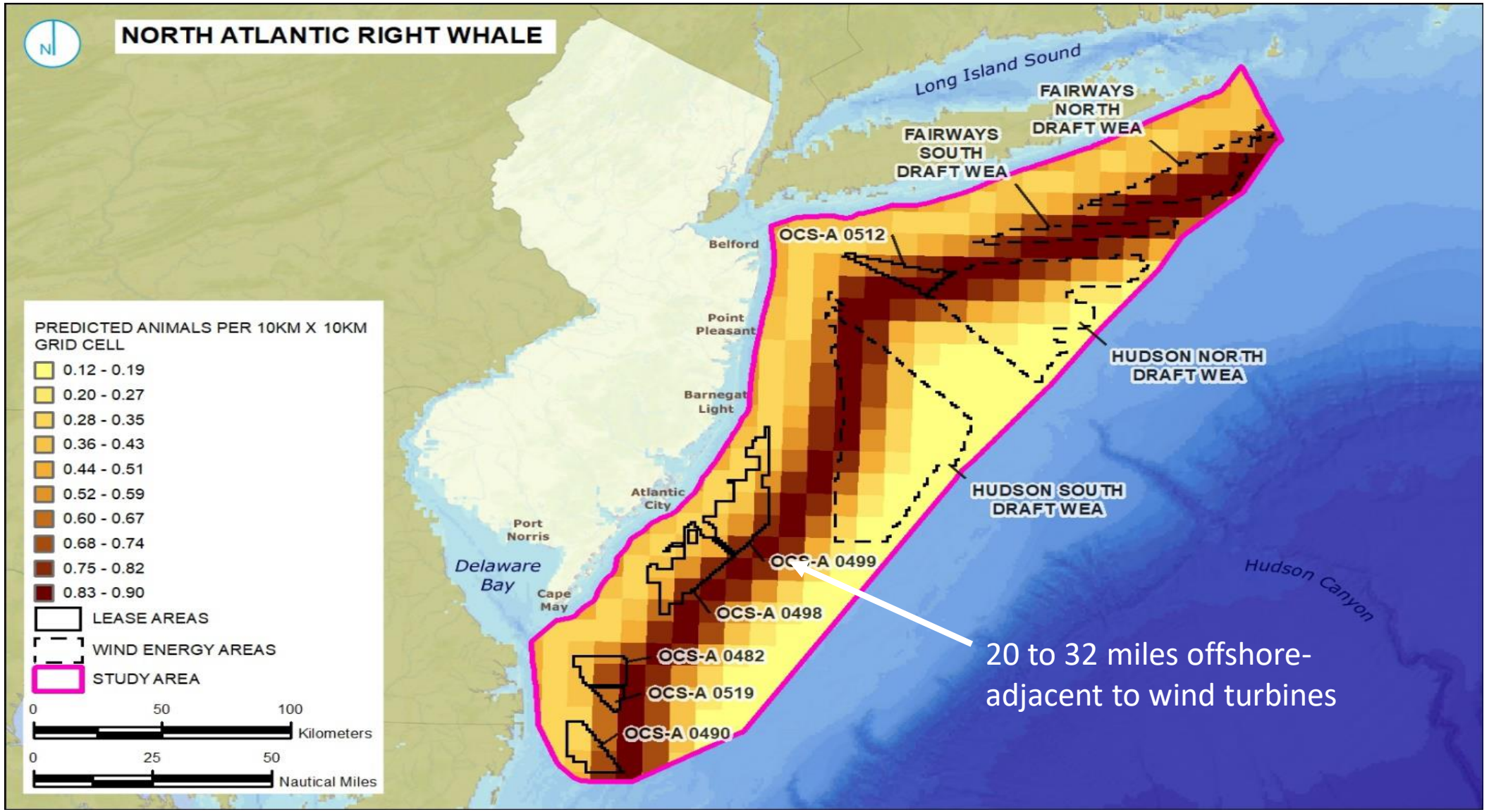
Further Degradation of the Shore Experience

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.

Increasing Underwater Noise with Turbine Power

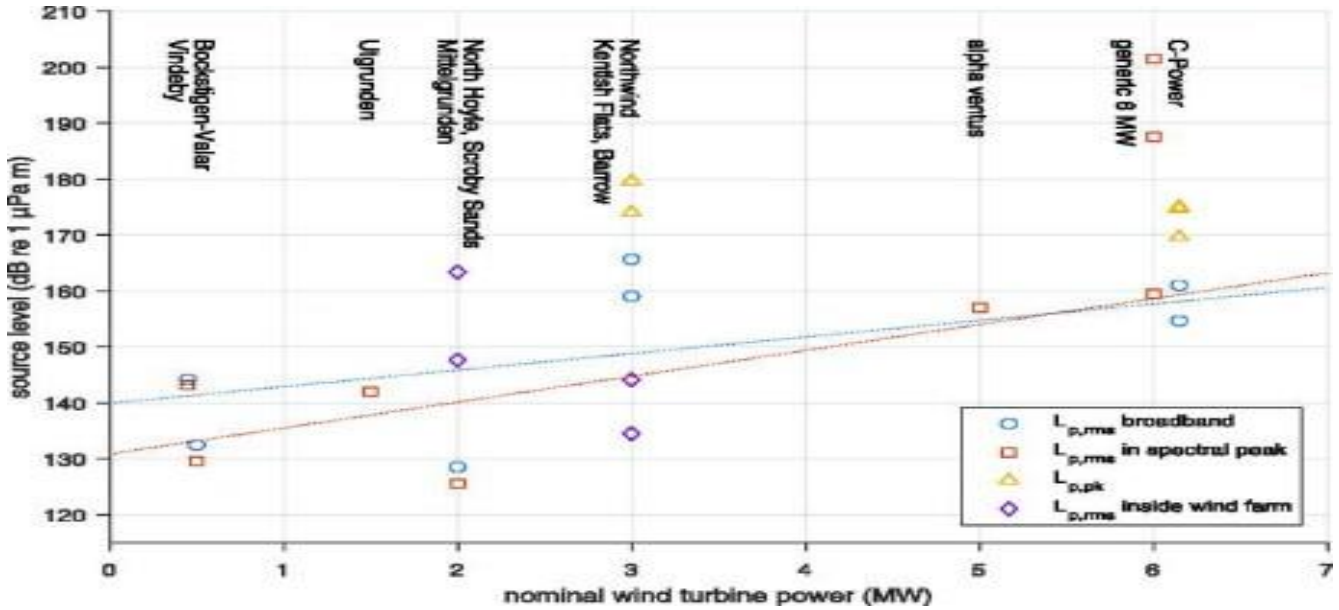


FIG. 1. (Color online) Source SPLs versus nominal wind turbine power as listed in Table I. The names of wind farms or the dat a source are indicated at the top of the figure. Regression lines for broadband levels (blue) and sound levels at spectral peaks (red) show the increasing trend.

Published in: Uwe Stöber; Frank Thomsen; *The Journal of the Acoustical Society of America* **149,** 1791 -1795 (2021)
DOI: 10.1121/10.0003760
Copyright © 2021 Acoustical Society of America

Impact of *Continuous, Operational* Turbine Noise on the North Atlantic Right Whale

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 come down to the NMFS level of 120 decibels(dB) to not disturb the whale.**
- **Noise levels therefore will exceed that throughout the entire 12-mile corridor, potentially blocking migration.**
- **Serious Problem, Not Receiving Enough Attention**

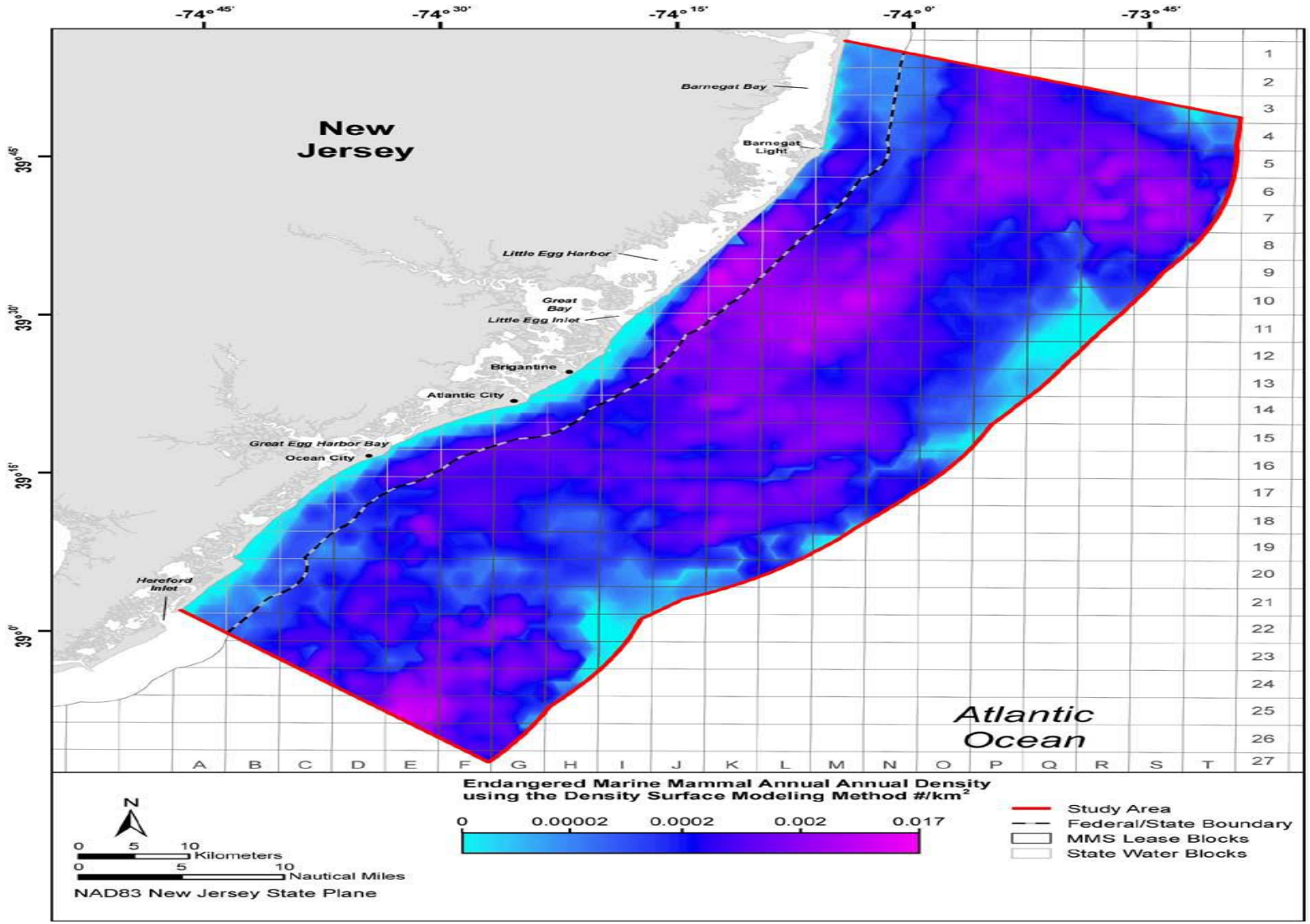
Right Whales- Bay Of Fundy

Right Whales: See them yourself…

https://youtube/byElUwZZlWw

Fin and Humpback Whales
Potentially Driven to Shore by Turbine Noise

Fin and Humpback Whale Density

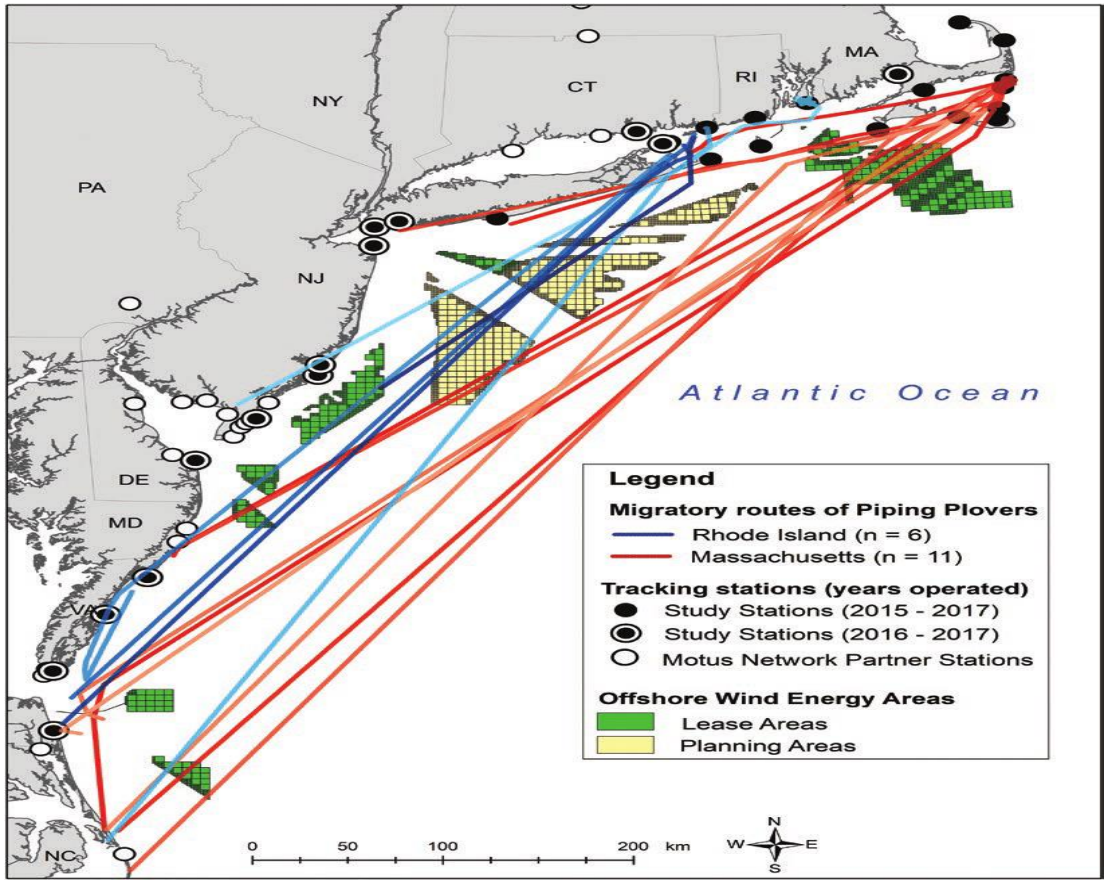


High Density –Pink Area- goes out to 11 Miles

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 LBI 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

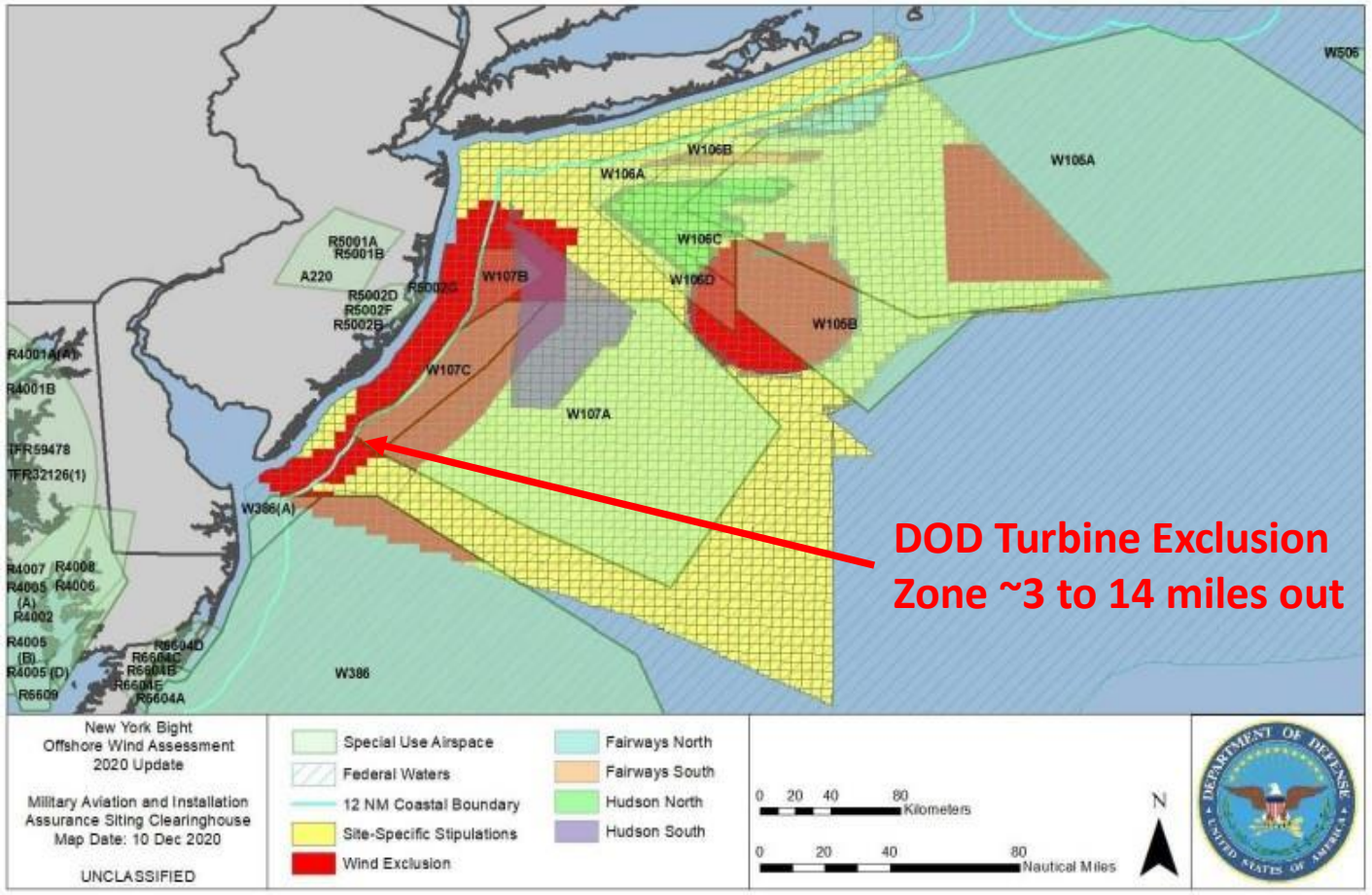
- Existence “threatened” under the U.S. Endangered Species Act, “endangered” per State law.
- Migrates offshore, north-south(PP1)
- About 86 protected plovers nest in Holgate and BL
- New nesting ground at Horseshoe Island
- Would have to cross multiple rows of turbines
- Very difficult to avoid rotating blades with 765-foot diameter, turbulent air, and a 200 mph tip speed
- Potential for high fatalities(PP2)
  - Estimate: 31 percent 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, New York, 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 flights per bird in & out.

SUSTAINMENT

Dept of the Navy Assessment

OASD (Sustainment)



60

Potential Conflict with National Security

Impact Summary and Potential Conflicts

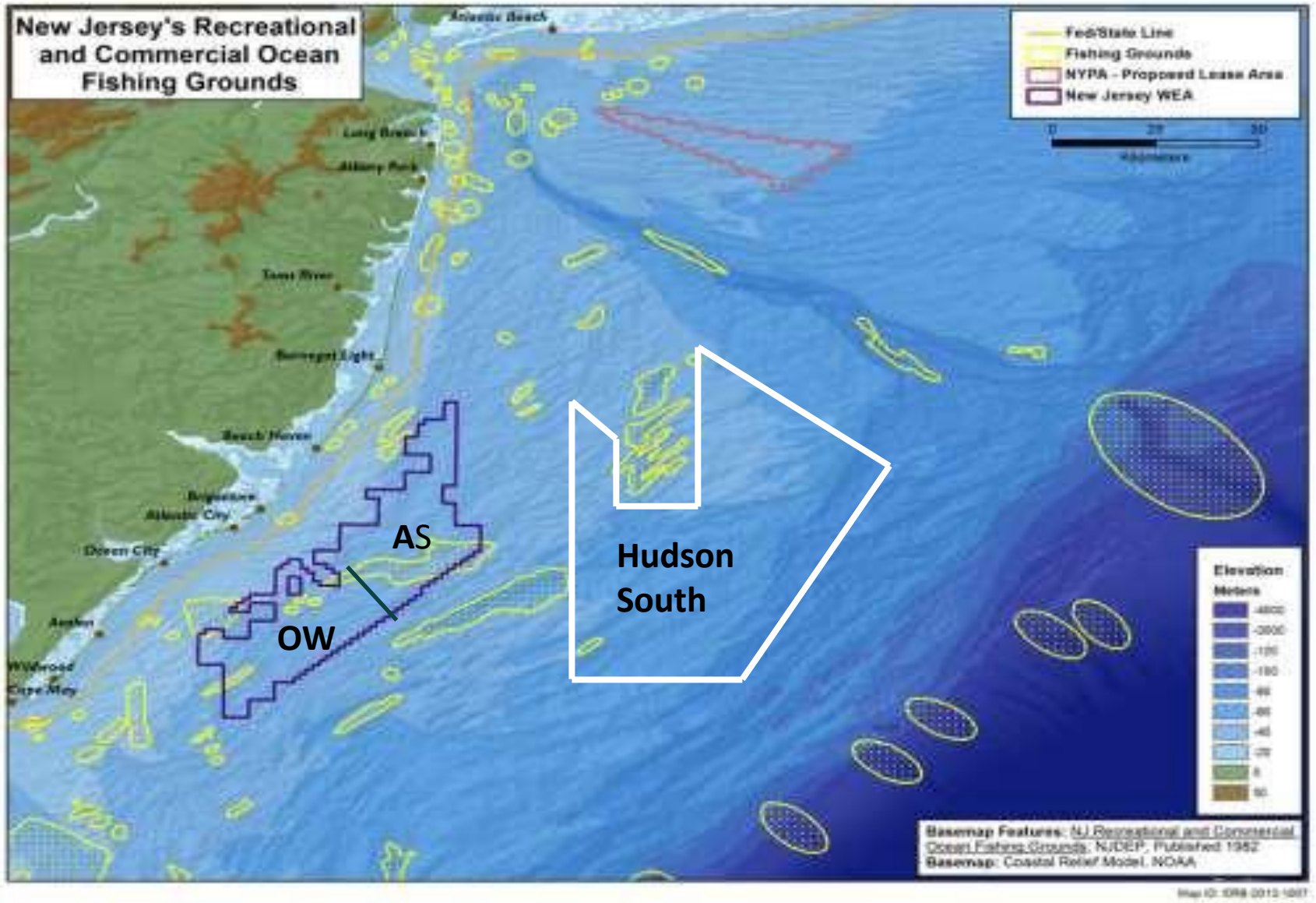
- **Largest, closest, most visible such project of anywhere in the world, NHPA, CZMA rules**
- **Reduces shore breezes (~26%), waves and increases local LBI air temperature, NEPA**
- **Significant impacts on the local shore economy , CZMA rules**
- **Potentially blocks the migration of a critically endangered 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)

A Much Better Location for Turbines: Hudson South

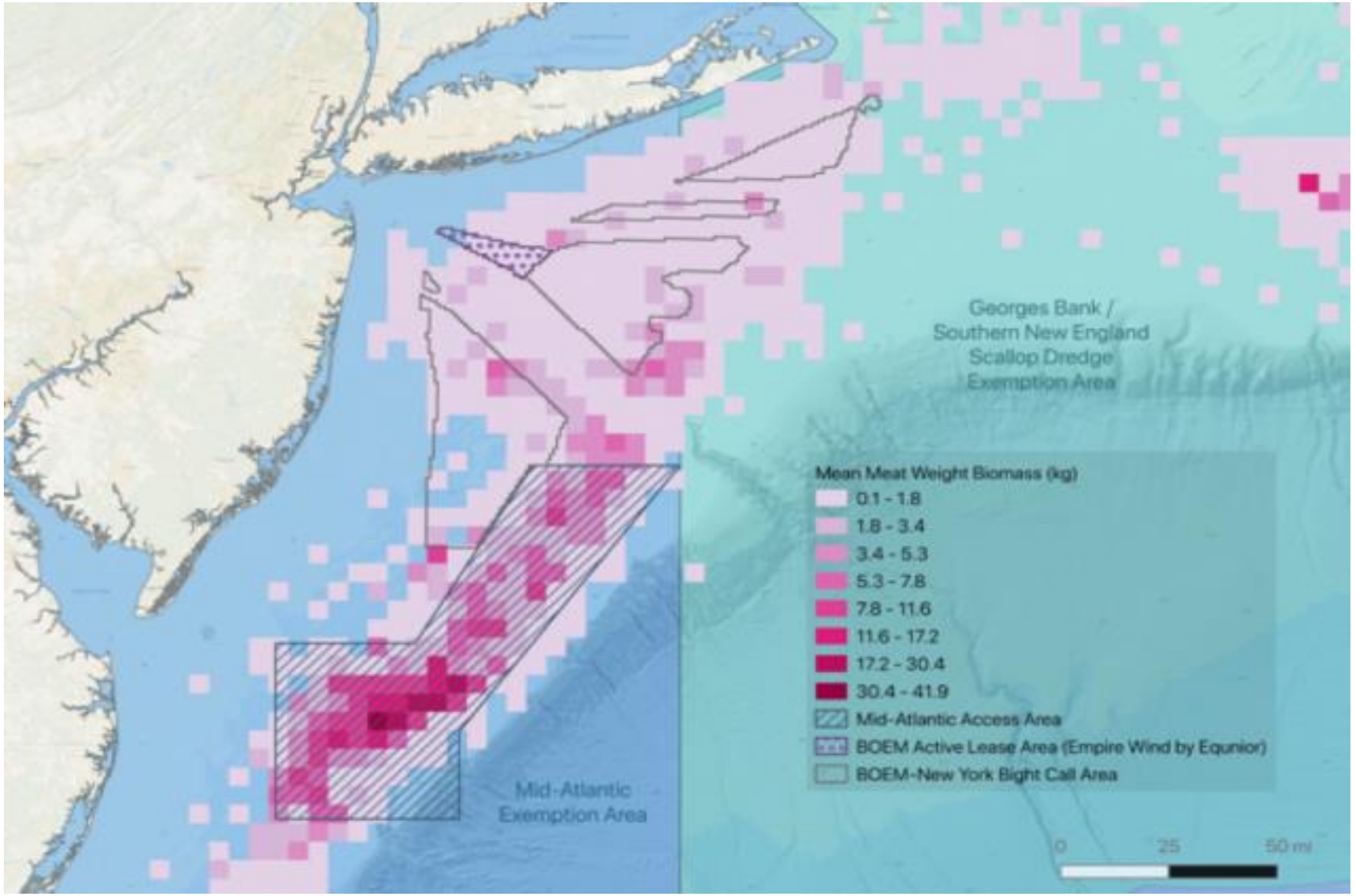
- 30 to 57 miles offshore, eliminates visibility, tourism, rentals and property value concerns.
- Screened by BOEM for:
  - Wind energy potential, greater, 6890 megawatts, higher wind speeds
  - Water depth less than 150 feet, Paulsboro monopile foundations viable
  - Cost of development, offshore cable cost small,~2.5%, of total capital cost
  - Visible impact-avoided
  - Navigation and fishing conflicts, but may still have some
- Pursued now for wind energy, recent sales, $ 4.3 billion paid by wind companies, clearly viable economically
- Room to mitigate the right whale migration problem

Intersections with Fishing Grounds: in light green



- AS: Atlantic Shores project off entire coast of LBI
- OW: Ocean Wind project off Atlantic City & Ocean City, NJ

Scallop Beds



A Better New Jersey Wind Program with Hudson South

- **New Jersey goal, 7500 megawatts(mw)**
- **Farther out Hudson South area so far, 4209 mw, 6790 mw potential**
- **Ocean Wind project to the south, so far 2248 mw, 3192 potential**
- **Close-in Project Not Needed IF NJ Secures Hudson South Power.**

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.

Conclusions

- **A Much Better NJ Offshore Wind Program with Hudson South**
- **Less Contentious, Litigious, Easier Program Implementation**
- **With Hudson South, Close-in LBI project not needed to meet State goal, Shore is Protected**
- **That is Save LBI's Objective**

What's Coming if We Don't Succeed

Support Us

- We are fighting for that Hudson South power
- Filed first lawsuit to require EIS preparation and public input before turbine locations are selected.
- Seeking donations to fund other lawsuits
- Get this Program Done Right
- Successful outcomes will benefit many shore towns
- Multiple ways to donate at www.SAVELBI.org
- Sign in for updates, finally, need active volunteers
- Counting on your support…

We know you love LBI… Right now LBI Needs You!

References: Visible and Shore Community Impact

V1.Global Insight, Inc. an Assessment of the Potential Costs and Benefits of Offshore Wind Turbines, prepared for the State of New Jersey, September. 2008
https://www.state.nj.us/bpu/pdf/announcements/njoswt.pdf

V2.University of Delaware, Atlantic Offshore Wind Energy Development: Values and Implications for Recreation and Tourism, sponsored by the Bureau of Ocean Energy Management(BOEM), March, 2018
https://espis.boem.gov/final%20reports/5662.pdf

V3. North Carolina State University, the Amenity Costs of Offshore Wind Farms- Evidence from a Choice Experiment in August 2017.
https://cenrep.ncsu.edu/cenrep/wp-content/uploads/2016/03/WP-2017-017.pdf

V4. The Bureau of Ocean Energy Management, BOEM, Renewable Energy Viewshed Analysis and Visual Simulation for the New York Outer Continental Shelf (OCS) Call Area: Compendium Report OCS Study, BOEM 2015- 044, 2015.
https://www.boem.gov/renewable-energy/state-activities/renewable-energy-viewshed-analysis-and-visualization-simulation

V5. The Bureau of Ocean Energy Management, BOEM, Turbine Exclusion Zone for New York State Based on Visible Impact, Federal Register Notice, Commercial leasing for Wind Power in the Outer Continental Shelf in the New York Area, April 18, 2018.
https://www.federalregister.gov/documents/2018/04/11/2018-07445/commercial-leasing-for-wind-power-on-the-outer-continental-shelf-in-the-new-york-bight-call-for

References: Endangered Whales

W1.New Jersey Offshore Wind Strategic Plan, Environment and Natural Resource Technical Appendix, Figure 21, North Atlantic Right Whale. 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 Journal of the Acoustical Society of America 149, 1791 (2021); https://doi.org/10.1121/10.0003760

W3.Thomsen et al., The Effects of Offshore Wind Farm Noise on Marine Mammals and Fish, July 06 2006. https://seagrant.gso.uri.edu/oceansamp/pdf/presentation/present_gill_europe.pdf

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.wwu.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

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

References: Jobs

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

References: Costs & Benefits

CB1.The Beacon Hill Institute, The Cost and Benefit of New Jersey's Offshore Wind Initiative, June, 2011.https://www.beaconhill.org/BHIStudies/NJ-Wind-2011/NJWindReport2011-06.p

References : Shore Impacts

OS1 Stoelinga et. al., “Estimating Long-Range External Wake Losses in Energy Yield and Operational Performance Assessments Using the WRF Wind Farm Parameterization”, ArcVera Renewables, 2022.