WE R HERE
WHEN YOU NEED US

2023 RCE Annual Conference

December 14-15, 2022

RUTGERS
New Jersey Agricultural Experiment Station

What's Happening With Offshore Wind Off New Jersey?

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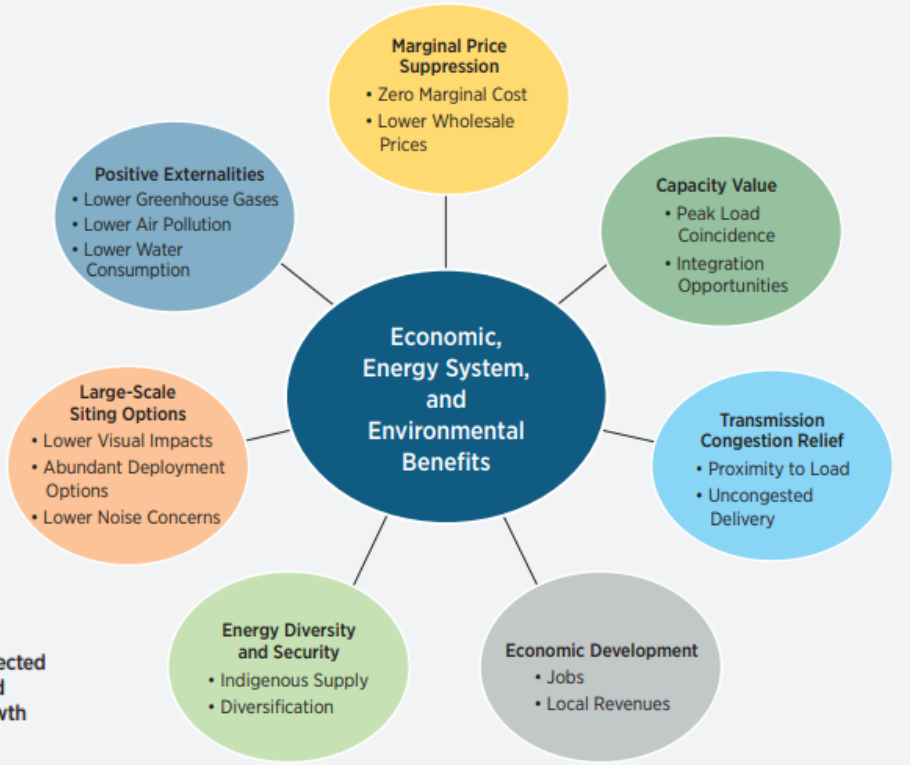
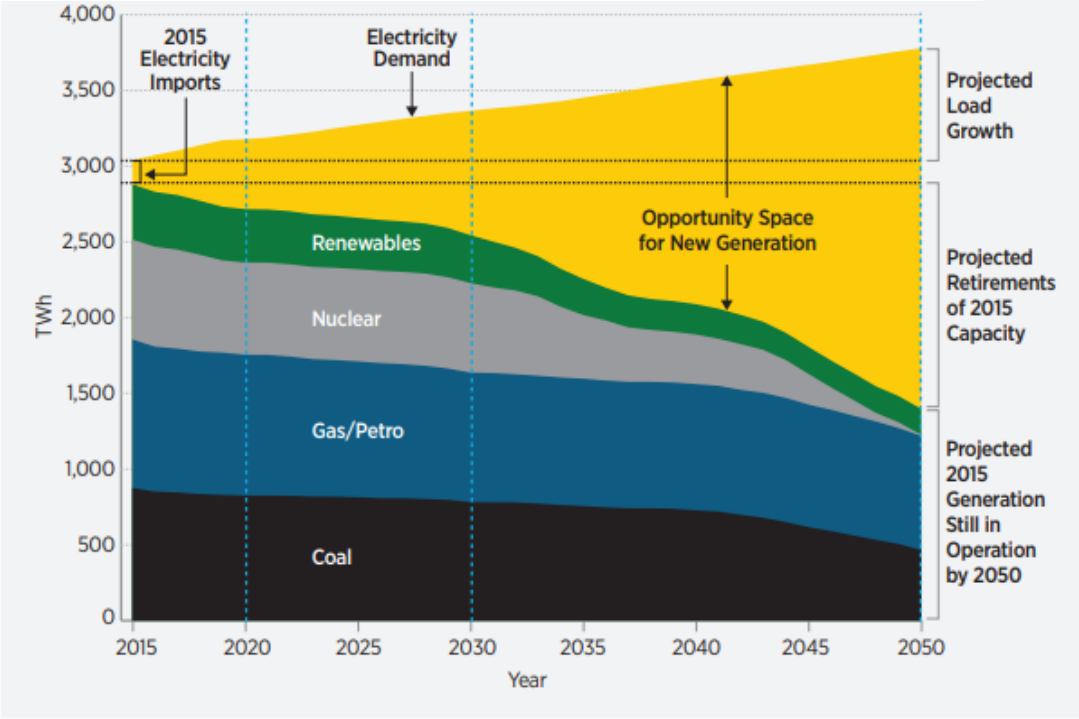
Rutgers, The State University of New Jersey
kohut@marine.rutgers.edu | 848-932-3496

Outline

- Overview of Offshore Wind Development (Doug)
- Q&A Break
- Rutgers University Offshore Wind Initiatives (Josh)
- Q&A Break

RUTGERS





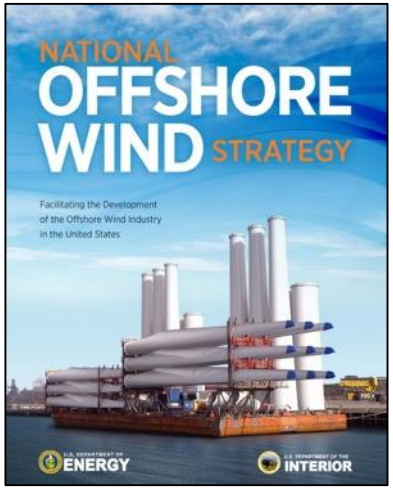
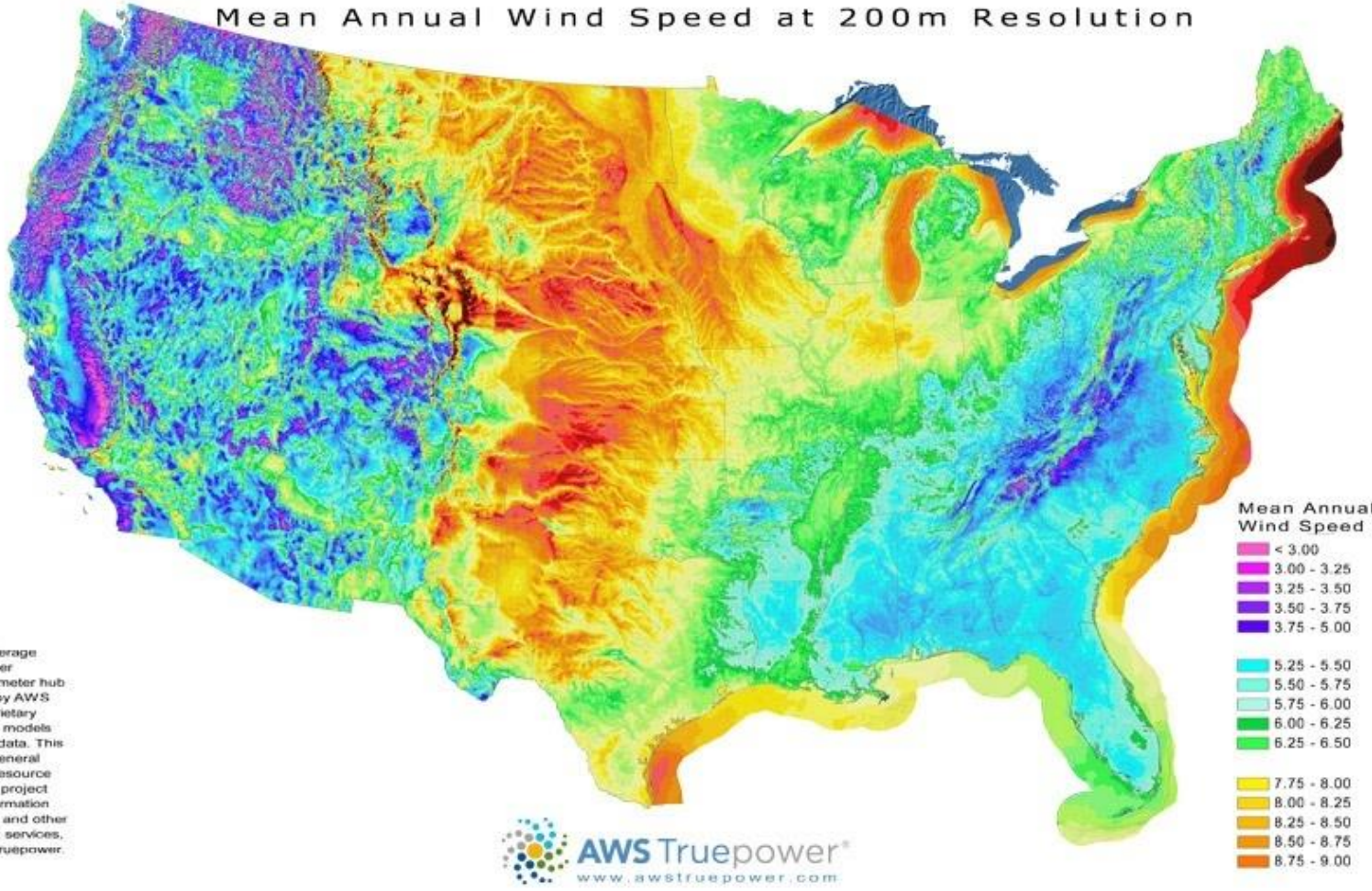


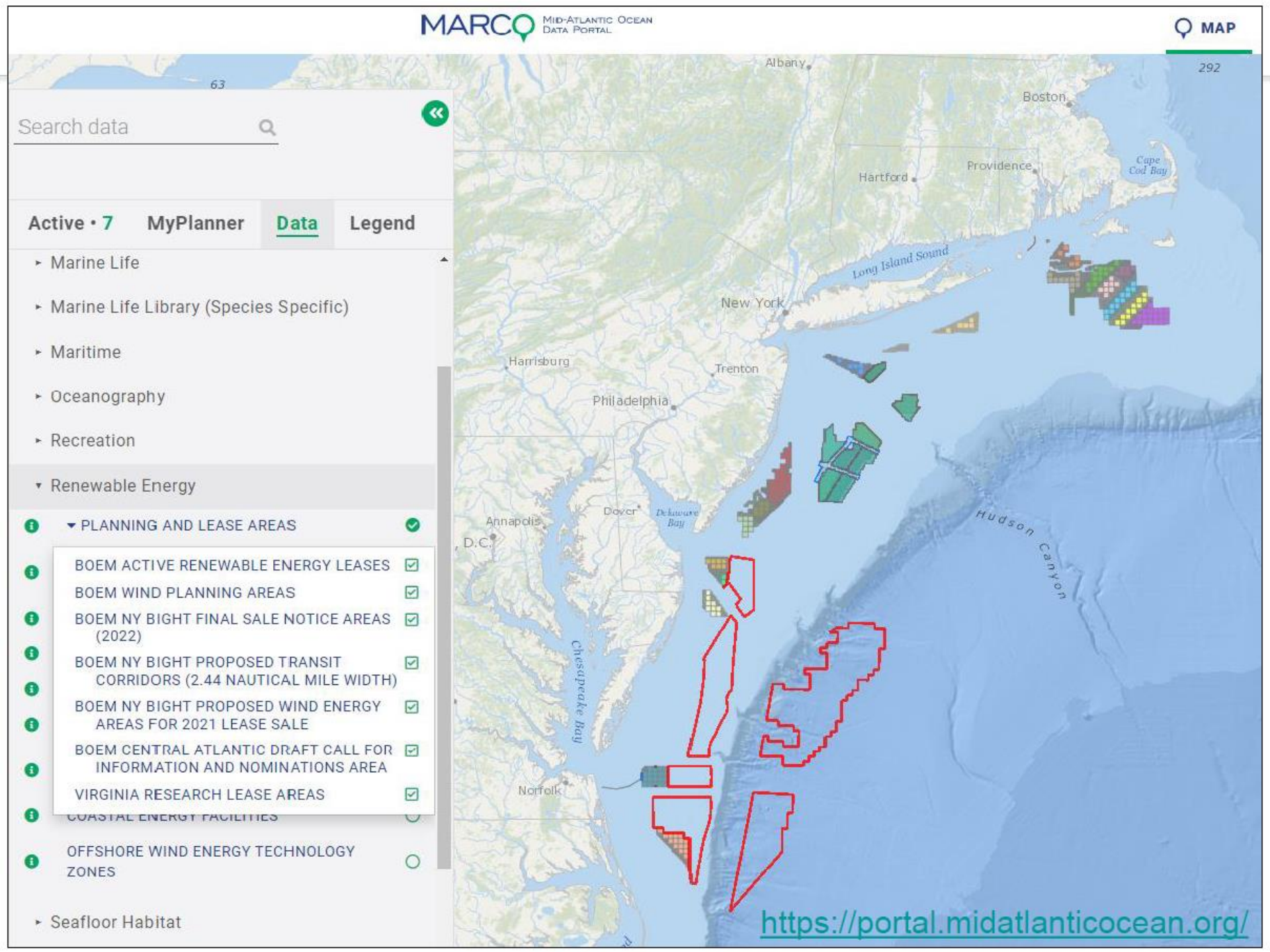
Figure 2.6. Scheduled and age-based retirements and load growth create opportunity for new offshore wind generation in coastal regions [22]

https://www.boem.gov/sites/default/files/renewable-energy-program/National-Offshore-Wind-Strategy-report-09082016.pdf

WIND RESOURCE OF THE UNITED STATES

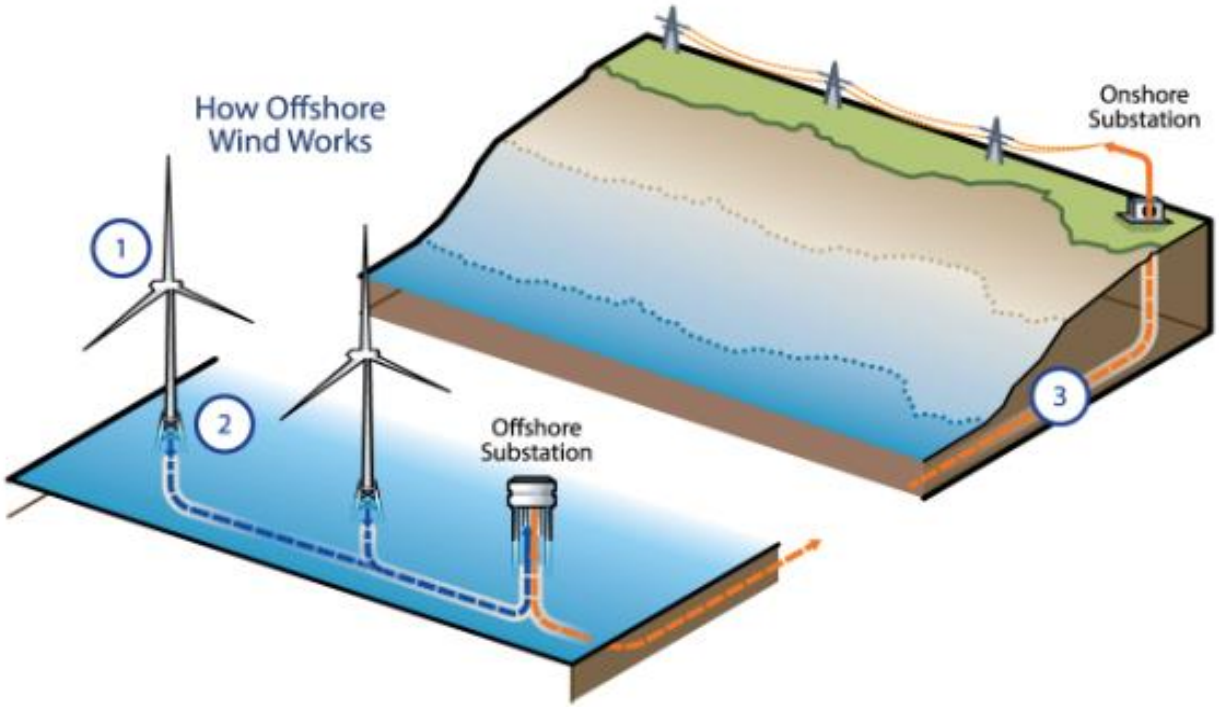


This map depicts the approximate annual average wind speed at 200 meter resolution and an 120 meter hub height. It was created by AWS Truepower using proprietary advanced atmospheric models and historical weather data. This map is provided as a general indication of the wind resource and is not intended for project design. For further information on wind project design and other wind energy consulting services, please contact AWS Truepower.


MARCO
Mid-Atlantic Ocean Data Portal
MAP
Search data
Active • 7
MyPlanner
Data
Legend
Marine Life
Marine Life Library (Species Specific)
Maritime
Oceanography
Recreation
Renewable Energy
PLANNING AND LEASE AREAS
BOEM ACTIVE RENEWABLE ENERGY LEASES
BOEM WIND PLANNING AREAS
BOEM NY BIGHT FINAL SALE NOTICE AREAS (2022)
BOEM NY BIGHT PROPOSED TRANSIT CORRIDORS (2.44 NAUTICAL MILE WIDTH)
BOEM NY BIGHT PROPOSED WIND ENERGY AREAS FOR 2021 LEASE SALE
BOEM CENTRAL ATLANTIC DRAFT CALL FOR INFORMATION AND NOMINATIONS AREA
VIRGINIA RESEARCH LEASE AREAS
OFFSHORE WIND ENERGY TECHNOLOGY ZONES
Seafloor Habitat
Albany
Boston
Hartford
Providence
Cape Cod Bay
Long Island Sound
New York
Harrisburg
Trenton
Philadelphia
Annapolis
D.C.
Dover
Delaware Bay
Chesapeake Bay
Norfolk
Hudson Canyon
https://portal.midatlanticocean.org/

How It Works

Here are some of the basics of how offshore wind turbines harvest the high-speed wind over water and convert it into usable electricity.



1. **Offshore Turbines** capture the wind's energy and generate electricity.
2. **Foundations** secure turbines to the ocean floor and cables transmit electricity to an offshore substation
3. **Electricity** flows through a buried cable to an onshore substation and is transferred to the existing transmission network.

https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/About-Offshore-Wind/Offshore-Wind-101

https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/About-Offshore-Wind/Offshore-Wind-101

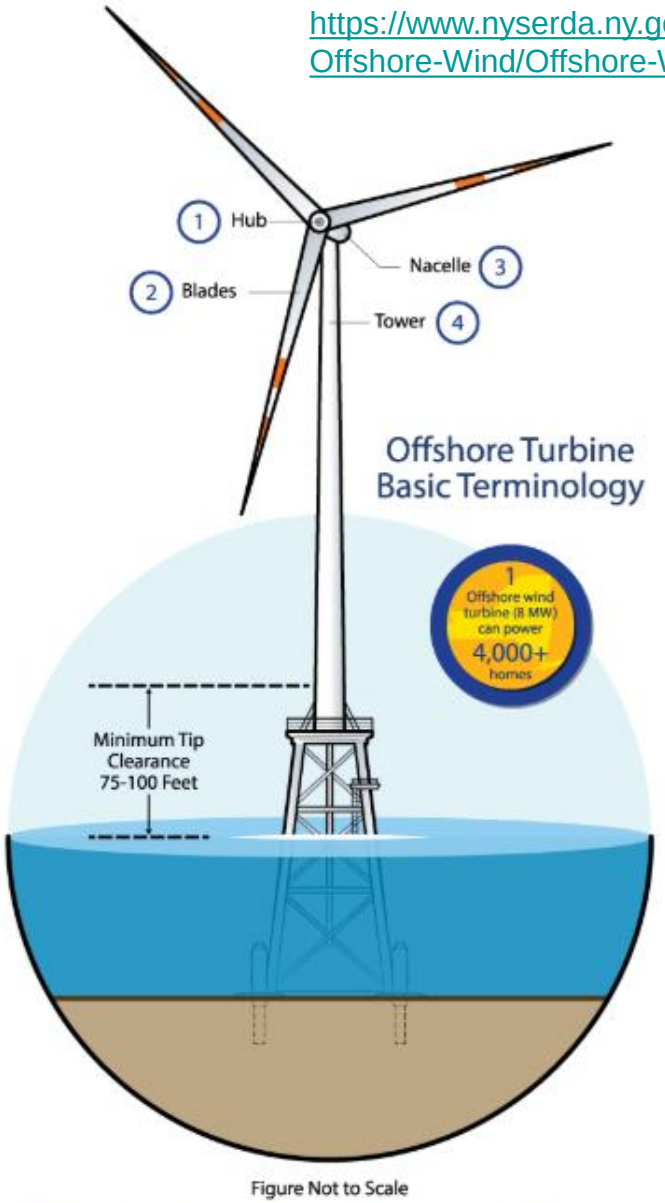


Figure Not to Scale

1. **Hub.** The hub supports the blades and houses the pitch system, which optimizes blade angle and rotation speed.
2. **Blades.** Blades capture the wind's energy and convert it into mechanical energy.
3. **Nacelle.** The nacelle houses the components that convert mechanical energy to electrical energy.
4. **Tower.** The tower supports the mass of the nacelle, hub, and blades.

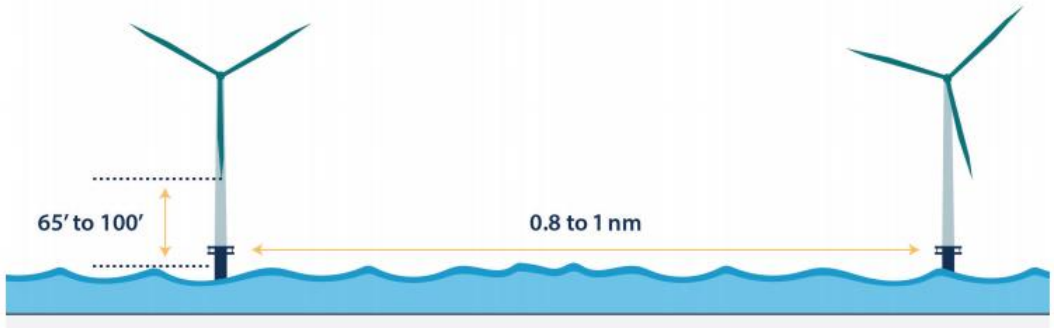
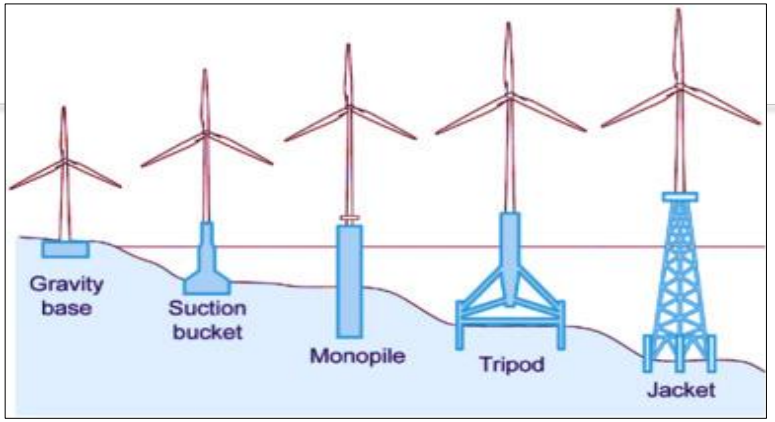


Figure 3.3. Six different offshore wind substructure types. The three on the far left are fixed-bottom substructures (monopile, jacket, and inward battered guide structure [also known as a twisted jacket]), and the three on the right are floating substructures (from left: semisubmersible, tension leg platform, and spar). *Illustration by Josh Bauer, NREL*

RUTGERS



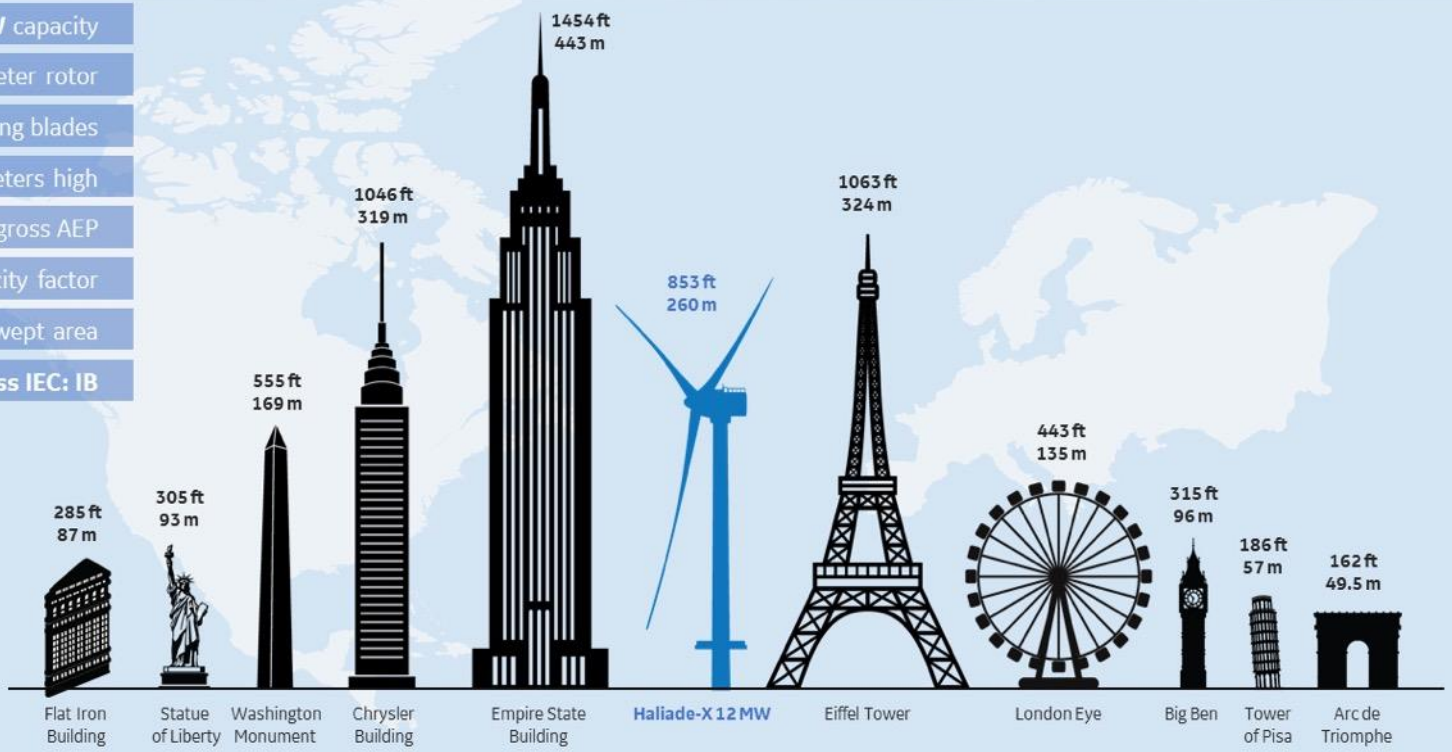
HALIADE-X 12 MW

GE Renewable Energy is developing **Haliade-X 12 MW**, the biggest offshore wind turbine in the world, with **220-meter rotor**, **107-meter blade**, leading capacity factor **(63%)**, and **digital capabilities**, that will help our customers find success in an increasingly competitive environment.

One **Haliade-X 12 MW** can generate **67 GWh annually**, which is **45% more** annual energy production (AEP) than most powerful machines on the market today, and twice as much as the Haliade 150-6MW.

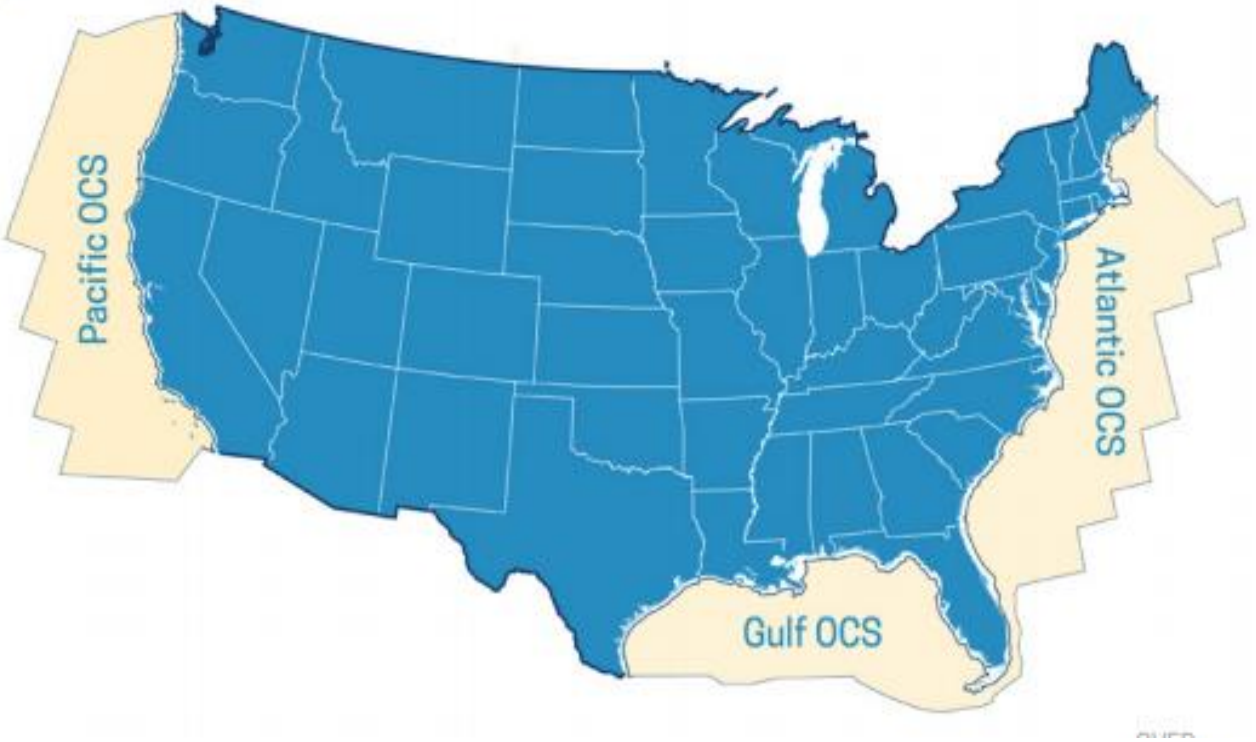
The **Haliade-X 12 MW** turbine will generate enough clean power for up to **16,000** European households per turbine, and up to **1 million** European households in a 750 MW configuration windfarm.

- **12 MW** capacity
- **220**-meter rotor
- **107**-meter long blades
- **260** meters high
- **67 GWh** gross AEP
- **63%** capacity factor
- **38,000** m² swept area
- **Wind Class IEC: IB**



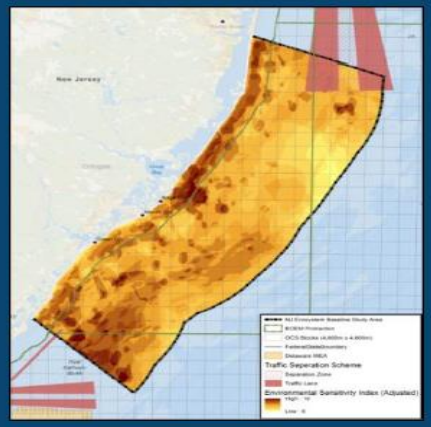
BOEM

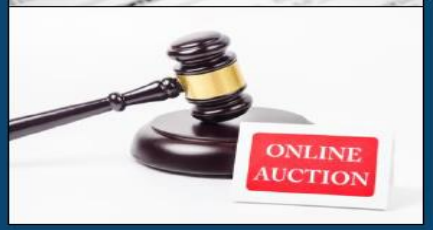
Bureau of Ocean Energy Management



https://www.boem.gov/sites/default/files/documents/about-boem/BOEM_FactSheet-AboutBOEM-2-26-2020_0.pdf

Planning & Analysis | Leasing | Site Assessment | Construction & Operations





[Planning & Analysis] [Leasing] [Site Assessment] [Construction & Operations]

Initiate Leasing Process (RFI/Call)

Lease Granted

Submit SAP

BOEM Deems COP Complete & Sufficient

BOEM Approves COP

Area Identification
Wind Energy Areas

Publish Leasing Notices

Pre-survey Meetings/Plan

Site Assessment & Surveys
(maximum timeframe)

BOEM Environmental & Technical Reviews

Installation

0 —— ~1/2

0 —— <1 1/2

0 —— 1

0 —— <5

0 —— 2

NEPA/Environmental Reviews

Auction

BOEM Reviews & Approves SAP

Submit COP
(with Project Design Envelope – optional)

Submit Design & Installation Plans

New Jersey Offshore Wind Solicitations

Solicitation	Minimum Capacity Target (MW)*	Capacity Awarded (MW)	Issue Date	Submittal Date	Award Date	Estimated COD
1	1,100	1,100	Q3 2018	Q4 2018	Q2 2019	2024-25
2	1,200 – 2,400	2,658	Q3 2020	Q4 2020	Q2 2021	2027-29
3	1,200 - 4,000		Q1 2023	Q2 2023	Q4 2023	2030
4	1,200**		Q3 2024	Q4 2024	Q2 2025	2032
5	1,200**		Q3 2026	Q4 2026	Q2 2027	2034
6	1,200**		Q3 2028	Q4 2028	Q2 2029	2036
7	1,200**		Q3 2030	Q4 2030	Q2 2031	2038
Total Awarded + Target	**11,000**					

*The Board may award projects above or below the target

**To be adjusted based on previous solicitation awards

BPU | New Jersey's cleanenergy program™

https://www.njcleanenergy.com/renewable-energy/programs/nj-offshore-wind/solicitations

Ocean Wind 1
An Ørsted & PSEG project

About the project | Resources & FAQs | Media | About us | Contact us

https://oceanwind.com/

Ocean Wind open house

The first offshore wind project in New Jersey delivering 1,100 MW of clean, reliable energy

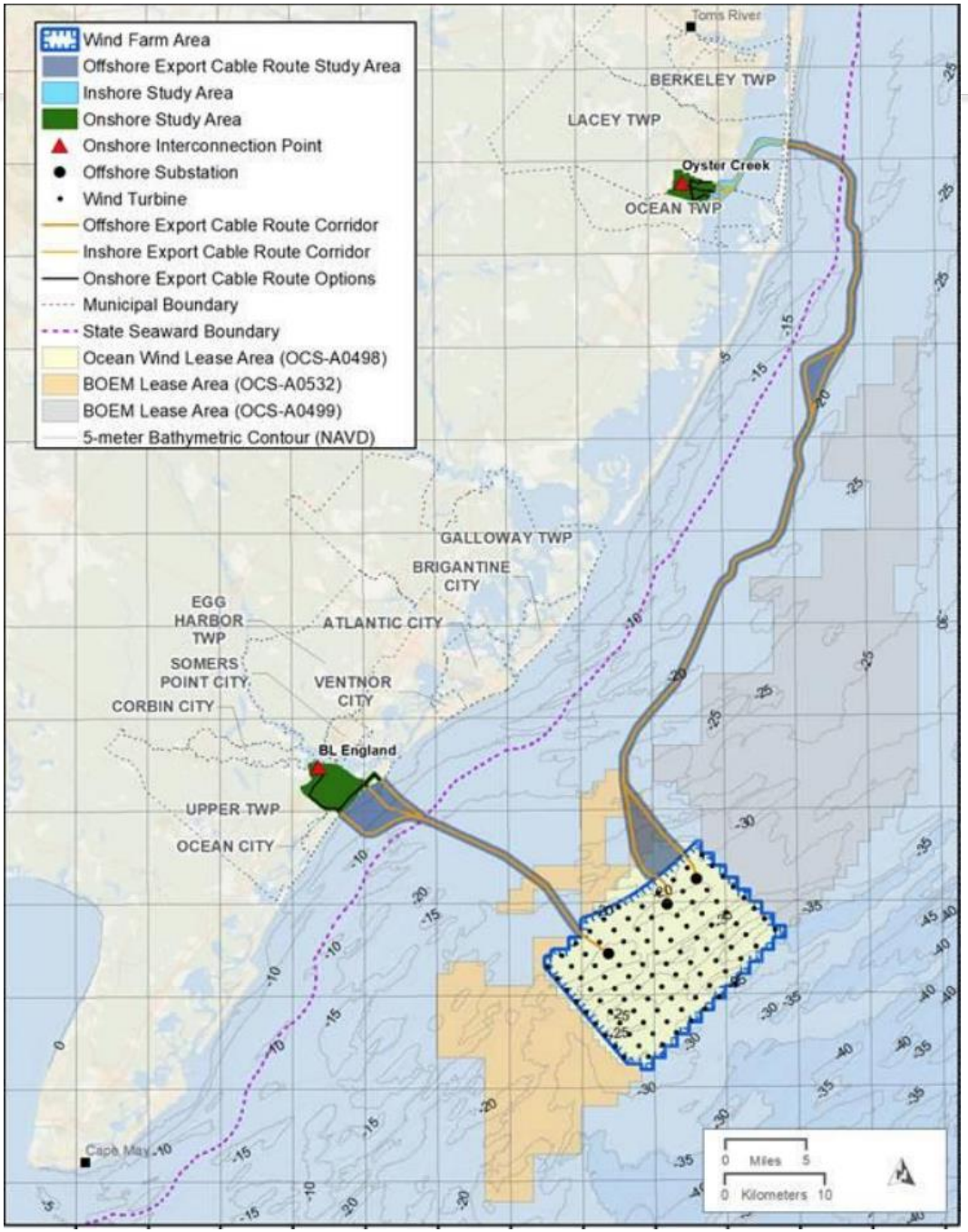
Located 15 miles off the coast of southern New Jersey, and creating enough electricity to power half a million homes

Read about the project

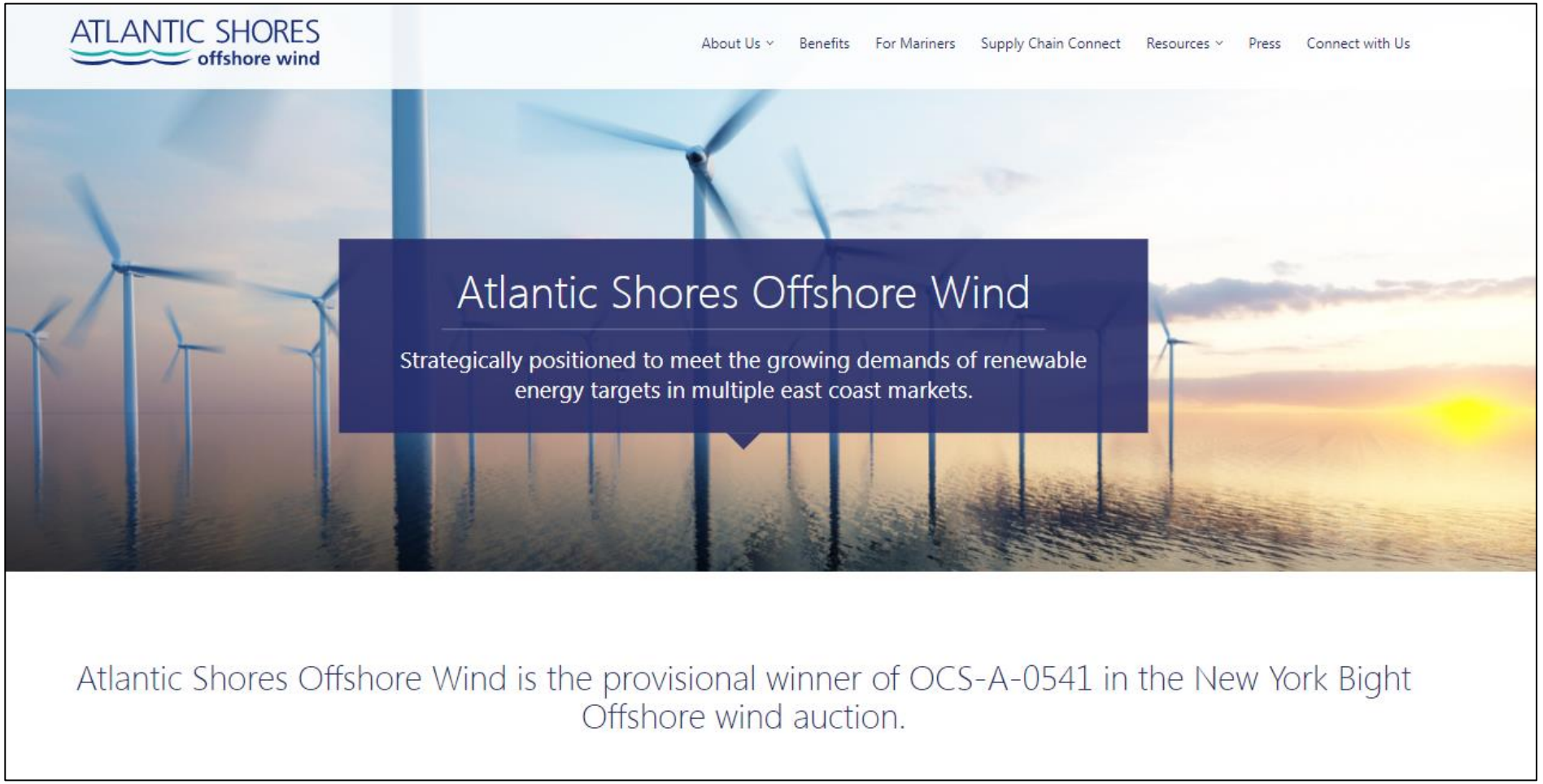
NOTICE OF GREEN ACRES PUBLIC SCOPING HEARING

View the Green Acres Scoping Hearing Presentation →

Get more information about the hearing



https://www.boem.gov/ocean-wind-construction-and-operations-plan



https://www.atlanticshoreswind.com/

Atlantic Shores Offshore Wind

Construction and Operations Plan

Lease Area OCS-A 0499

Volume I: Project Information

Submitted to:

BOEM
Bureau of Ocean Energy Management

Submitted by:

ATLANTIC SHORES offshore wind

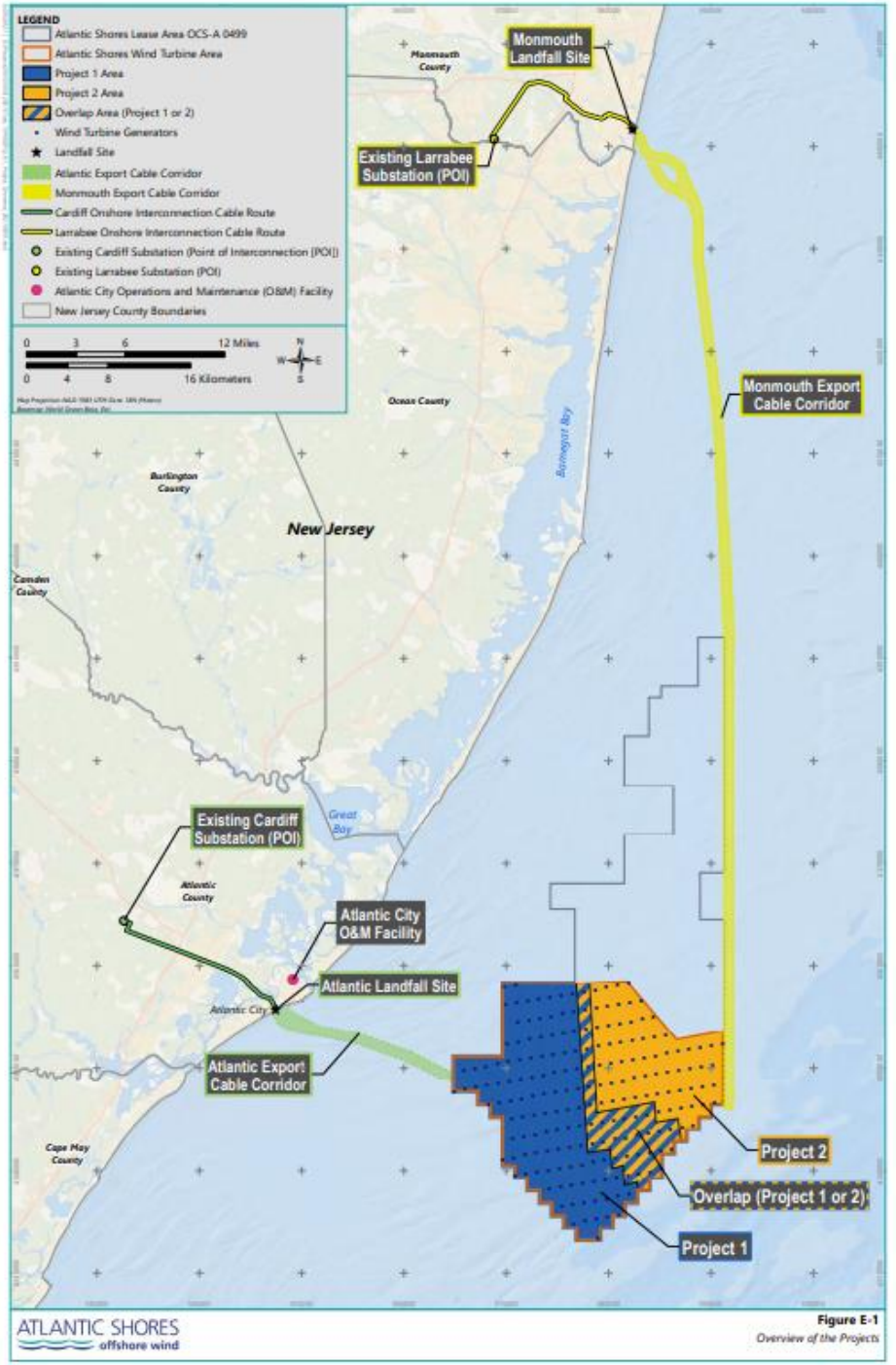
Prepared by:

EDR a better environment

Epsilon Associates Inc.

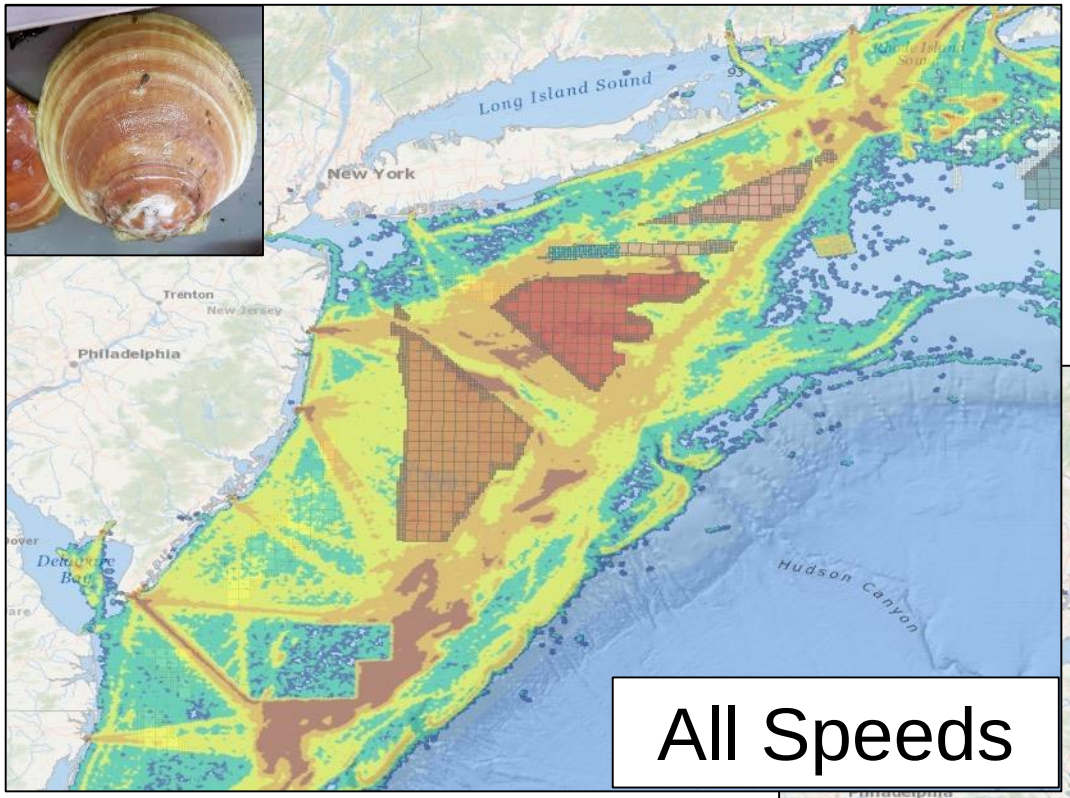
September 2021

https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Atlantic-Shores-COP-Volume-1-Project-Description.PDF

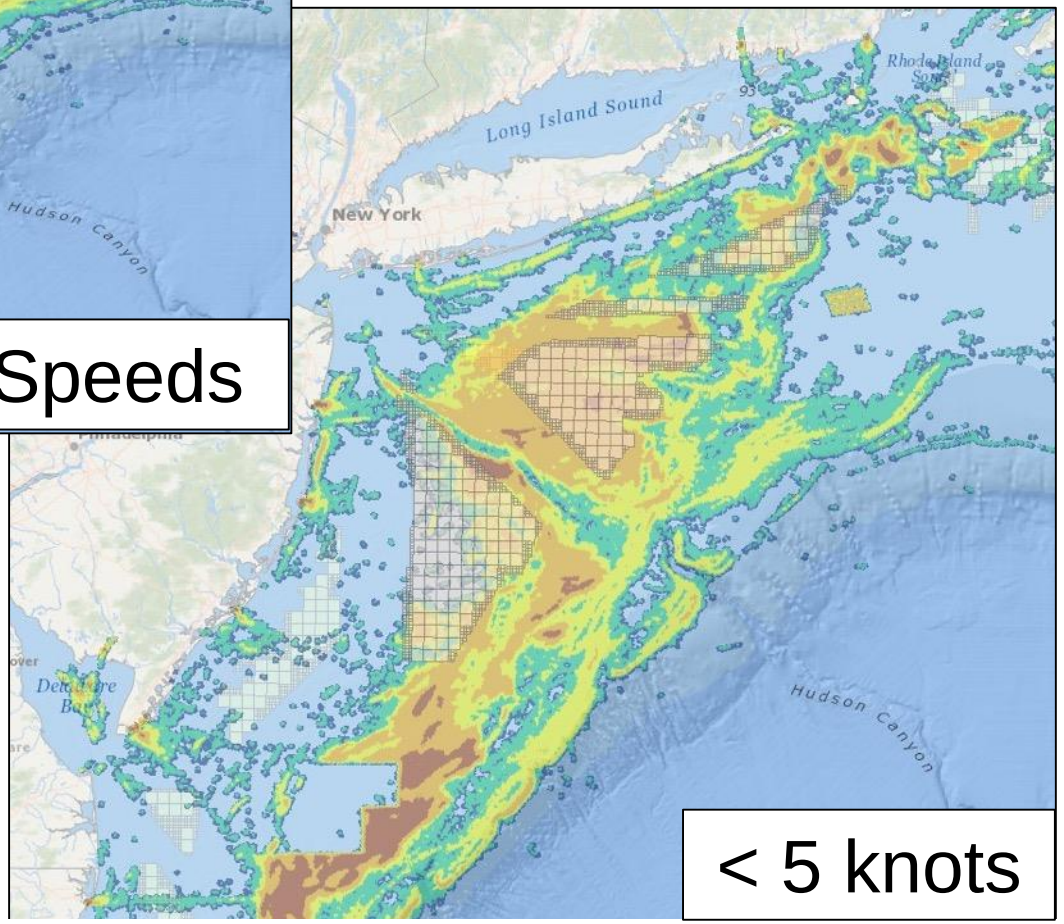


MARCO
MID-ATLANTIC REGIONAL COUNCIL ON THE OCEAN

https://portal.midatlanticocean.org/



All Speeds



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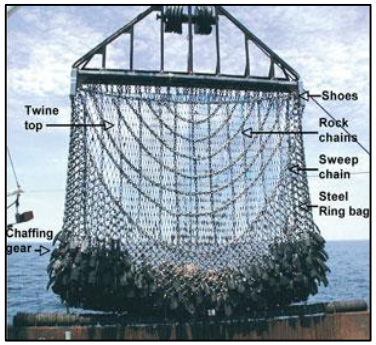
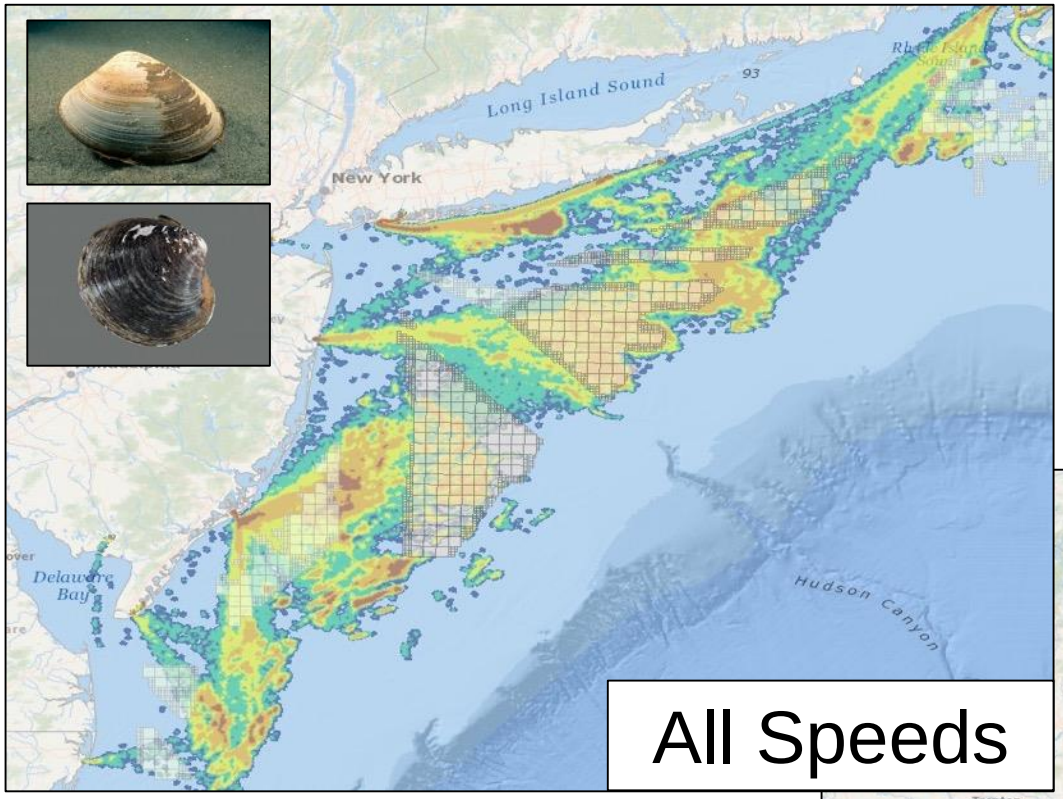


Commercial Sea Scallop Fishery – Vessel Monitoring System (VMS) – 2015-2016



All Speeds

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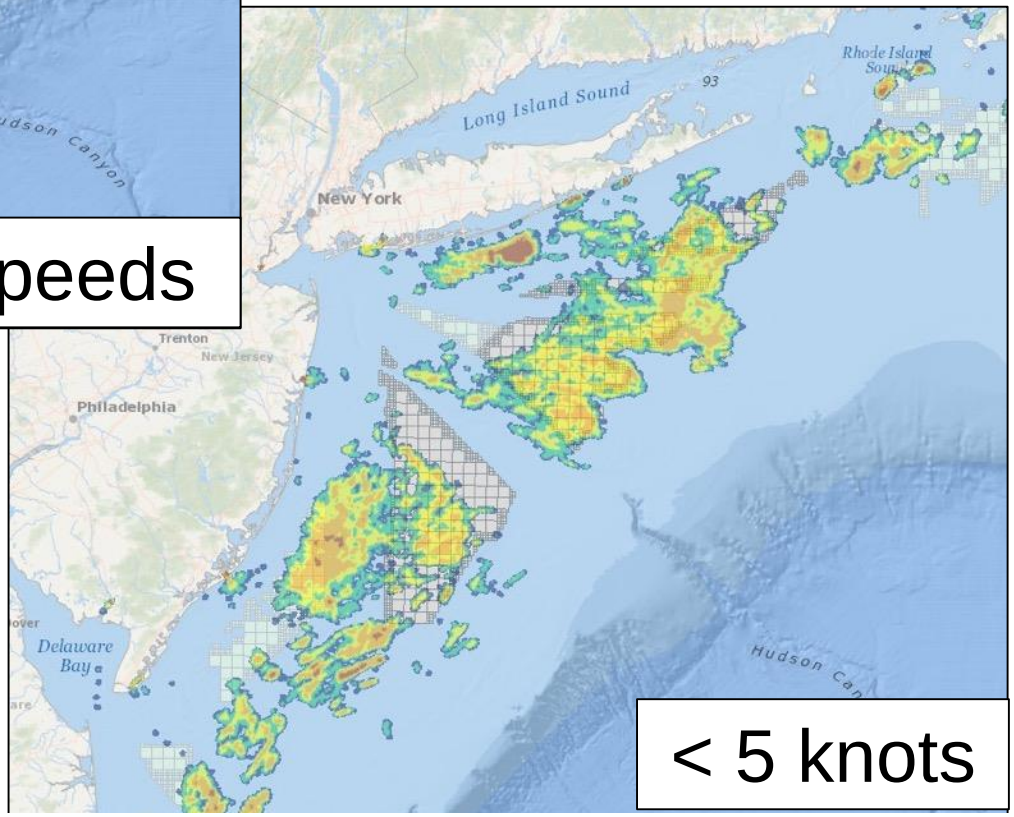


< 5 knots

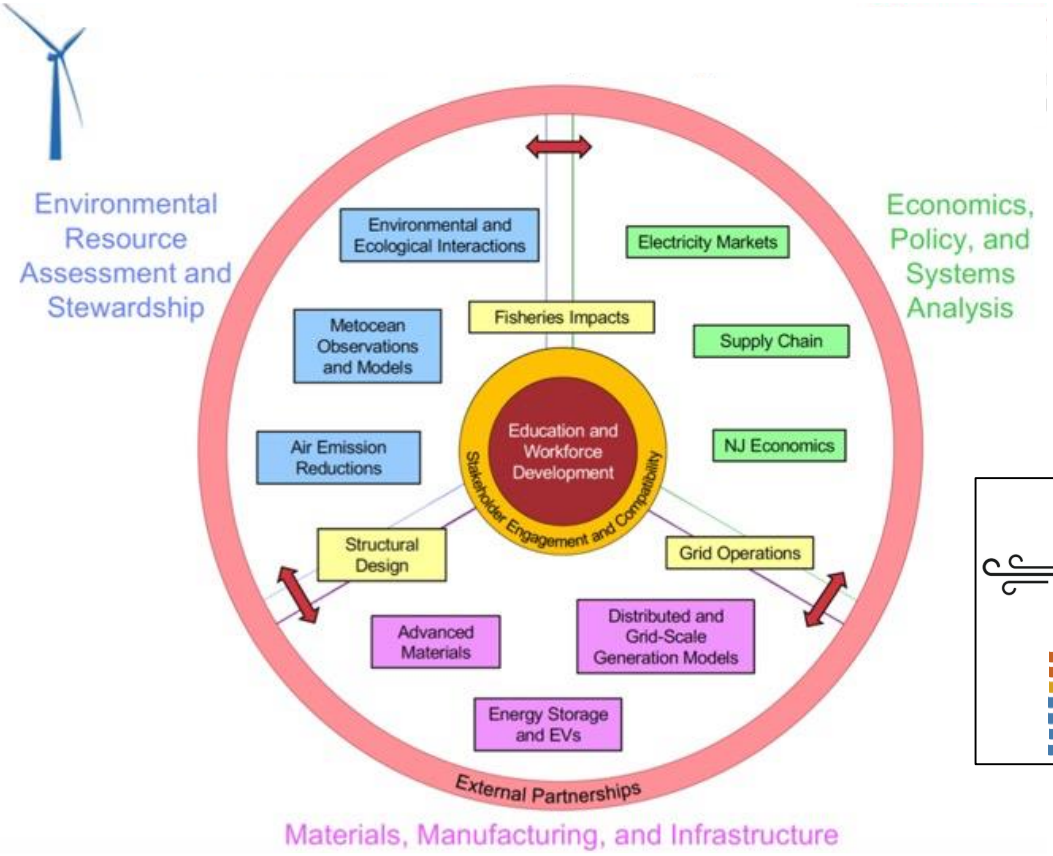
Surfclam/Ocean Quahog – Vessel Monitoring System (VMS) – 2015-2016

Potential Fisheries Impacts

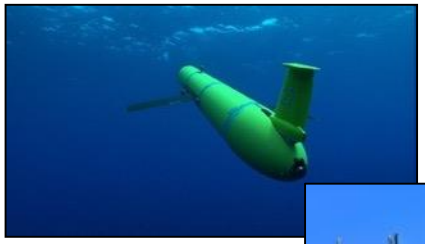
- **Accessibility**: Before, during, and after construction
  - Placement and spacing of turbines and cables
  - During fishing activities and while transiting – *also, research surveys*.
  - Cumulative impacts
- **Ecosystem Impacts**: Influences on physical and biological processes
  - Ocean-atmosphere interactions, currents, cold pool dynamics
  - Distribution, behavior, reproduction, and survival of marine fishery resources
- **Navigation and Safety**: During fishing activities and while transiting
  - Varying weather conditions, different user groups, radar impacts

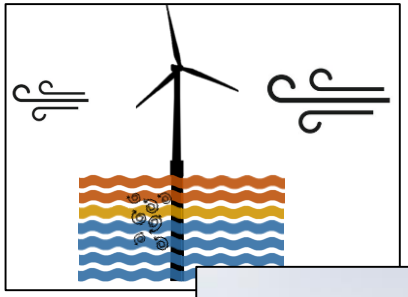
Q&A Break

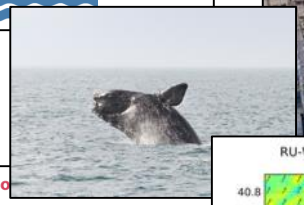
The Rutgers University Offshore Wind Collaborative

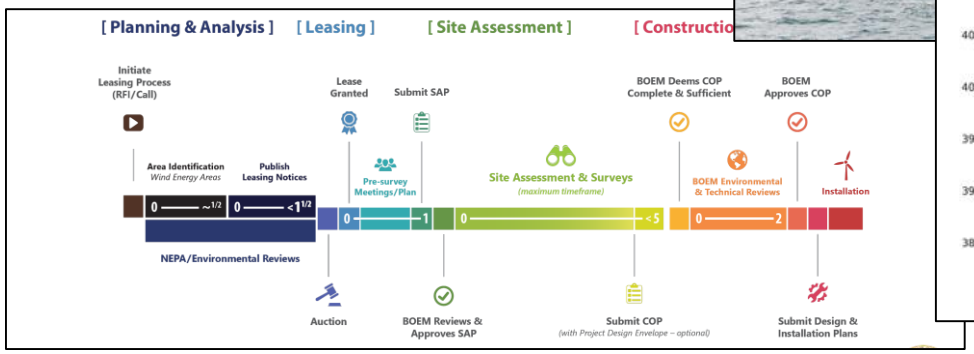


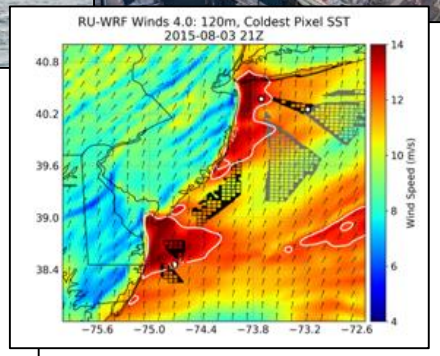
RUTGERS
THE STATE UNIVERSITY OF NEW JERSEY











Wind Institute Fellowship Program

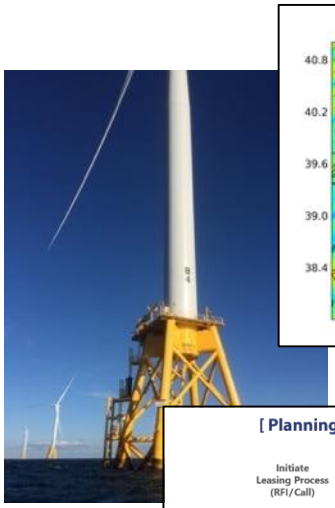
- **Work** with a faculty mentor
- **Gain industry knowledge** through monthly activities
- **Present research findings** at an April 2023 Symposium
- **Network with leaders** in the offshore wind industry
- **Receive fellowship stipend**

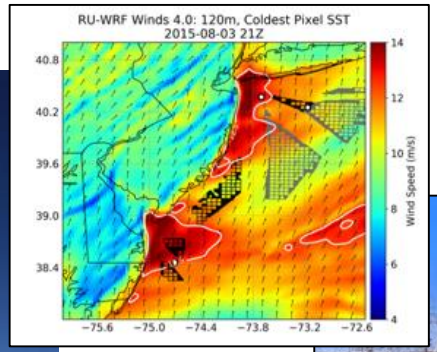
Undergraduate Students

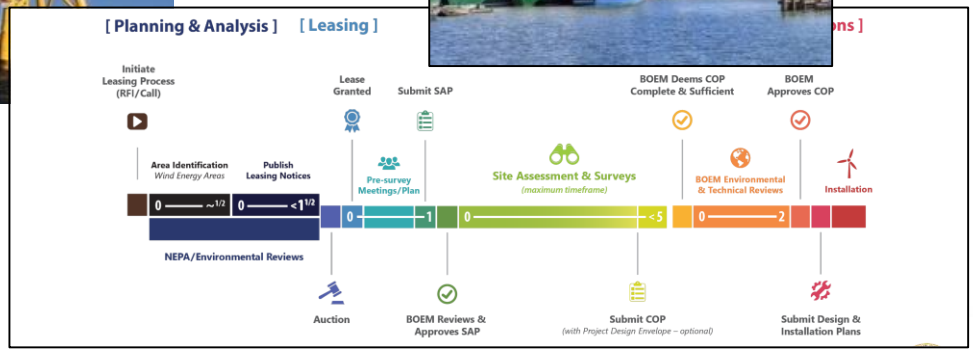
Graduate Students

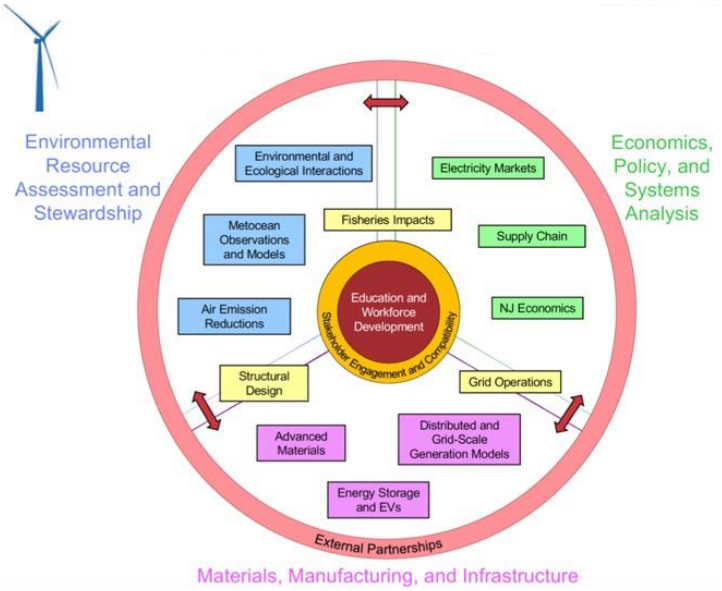
University Initiatives Program

- **Offshore Wind Curriculum Development**
- **University Wide Symposium**
- **Local campus community development**









« All Events

Rutgers Offshore Wind Symposium

January 12, 2023 @ 8:30 am - 4:00 pm

January 12, 2023
Weeks Hall, School of Engineering
Rutgers University – Busch Campus
8:30 am to 4:00 pm

Register by Jan. 5 for this free in-person event:
Click here to register.

Get swept up in offshore wind! Join us for a day of collaboration among Rutgers faculty and students, industry and government leaders to discuss challenges, identify opportunities, and build community in offshore wind energy at Rutgers, the state and region.

Stephen Boutwell/BOEM

Upcoming Events

Rutgers Offshore Wind Symposium
January 12, 2023 @ 8:30 am - 4:00 pm

View All Events

Archives

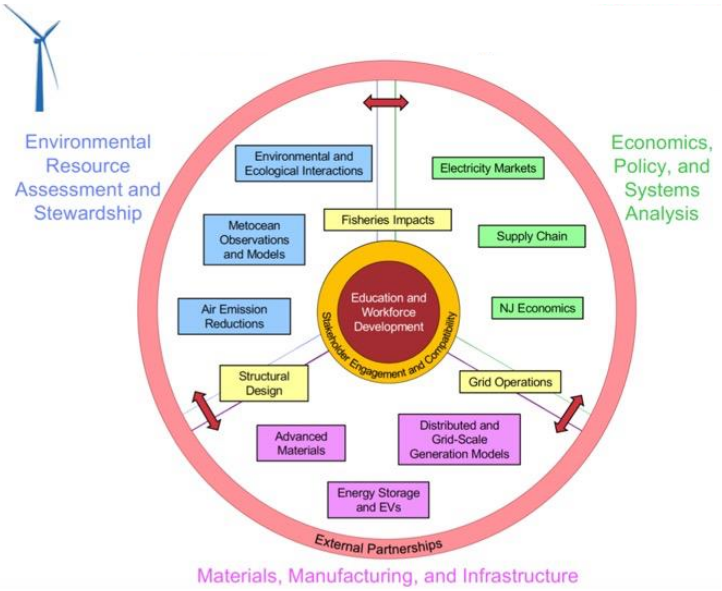
Categories

No categories

https://osw.rutgers.edu/event/symposium/

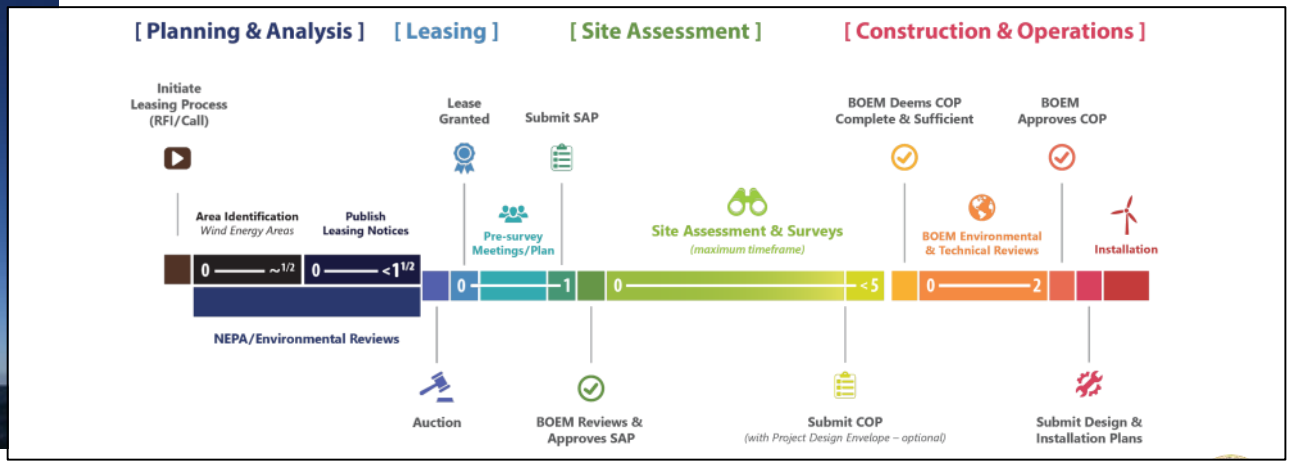
University Initiatives Program

- **Offshore Wind Curriculum Development**
- **University Wide Symposium**
- **Local campus community development**
  - **Three face-to-face community-building events** that will occur at Rutgers Camden, Rutgers Newark, and RBHS (New Brunswick).
  - Present the entire **Rutgers family** to the **offshore wind energy community**.
  - The goal of these events is to **build lasting relationships between the members of Rutgers University** and the **broader public, private, and academic sectors**.



Stakeholder Engagement

- Wind Developers
- NJ Communities
- Local, State and Federal Agencies
- Non Profit Organizations



Relevance to Other Extension Programs

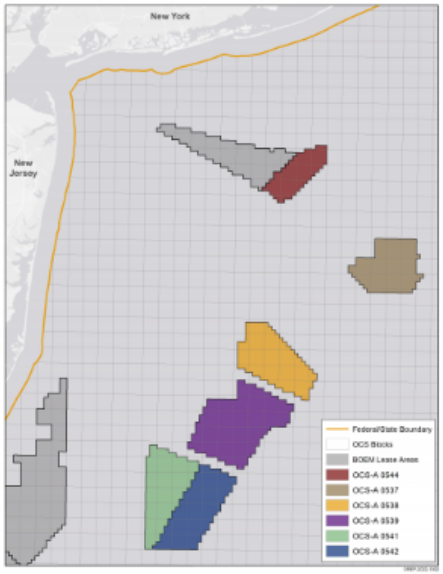
- Offshore wind includes significant development that will impact several facets of New Jersey, thereby presenting opportunities for inclusion in other Extension programming:
  - Climate Change
  - Marine Science
  - Environmental Science
  - Natural Resource Management
  - Engineering
  - 4-H STEM Programs
  - Renewable Energy
    - Synergies with on-farm renewables

New Jersey Activities

What's New? | Leasing History

New York Bight

On Feb. 25, 2022, the Department of the Interior announced the results of the nation's highest-grossing competitive offshore energy lease sale in history, including oil and gas lease sales, with the New York Bight offshore wind sale. These results are a major milestone towards achieving the Biden-Harris administration's goal of reaching 30 gigawatts of offshore wind energy by 2030. The lease sale offered six lease areas totaling over 488,000 acres in the New York Bight for potential wind energy development and drew competitive winning bids from six companies totaling approximately $4.37 billion. To learn more: https://www.boem.gov/renewable-energy/state-activities/new-york-bight.



New York Bight Lease Areas

Efforts Underway

In January 2022, Secretary Haaland was joined by New Jersey Governor Phil Murphy and New York Governor Kathy Hochul to outline their shared vision for developing a robust offshore wind domestic supply chain that will deliver benefits to residents of New York and New Jersey and the surrounding region, including underserved communities. This collaboration will serve as a model for future engagement and establish the U.S. as a major player in the global offshore wind market.

There are three renewable energy efforts underway offshore New Jersey. For more information please click on the links below:

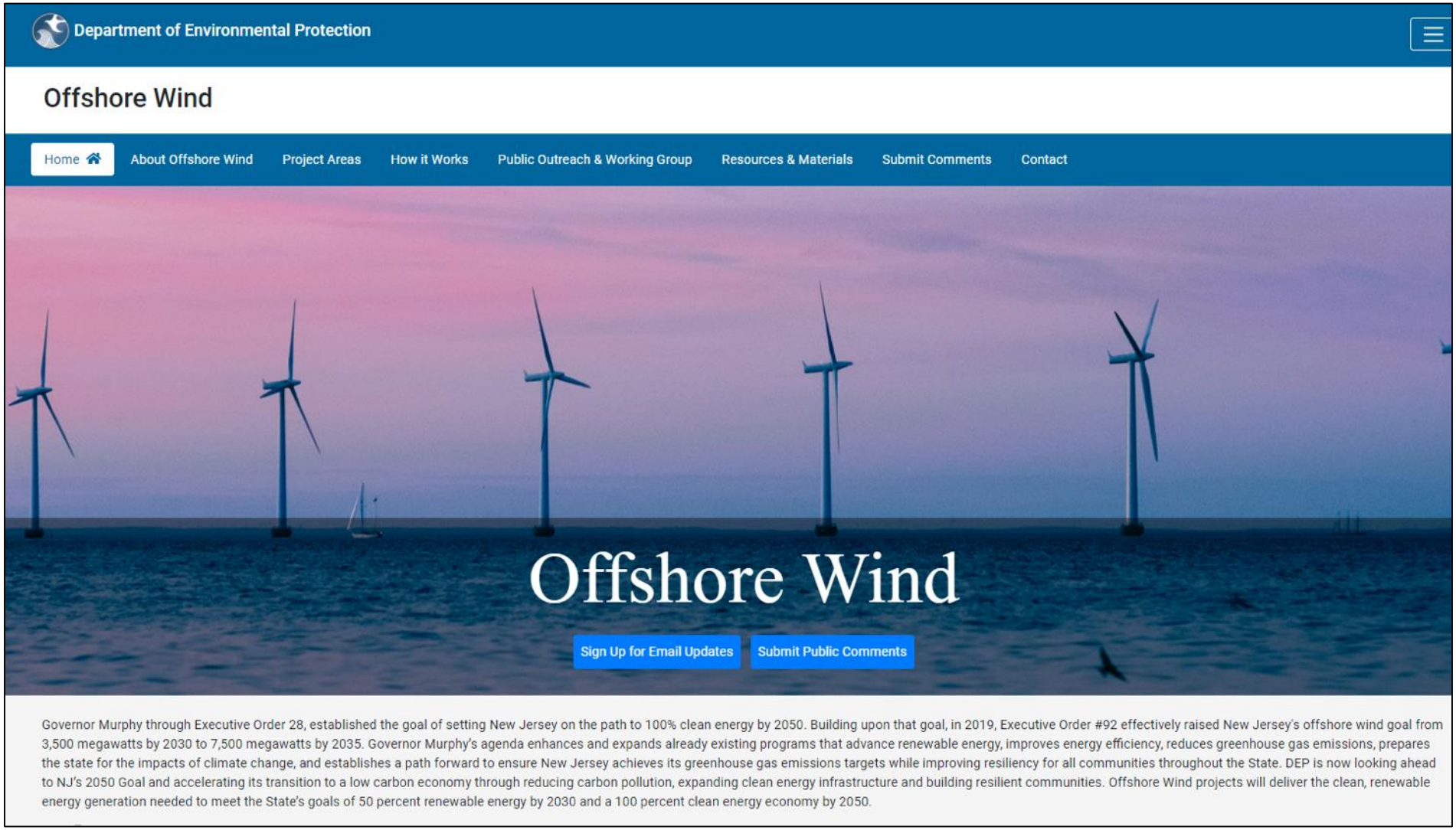
- Atlantic Shores
- Ocean Wind
- New York Bight

Environmental Studies

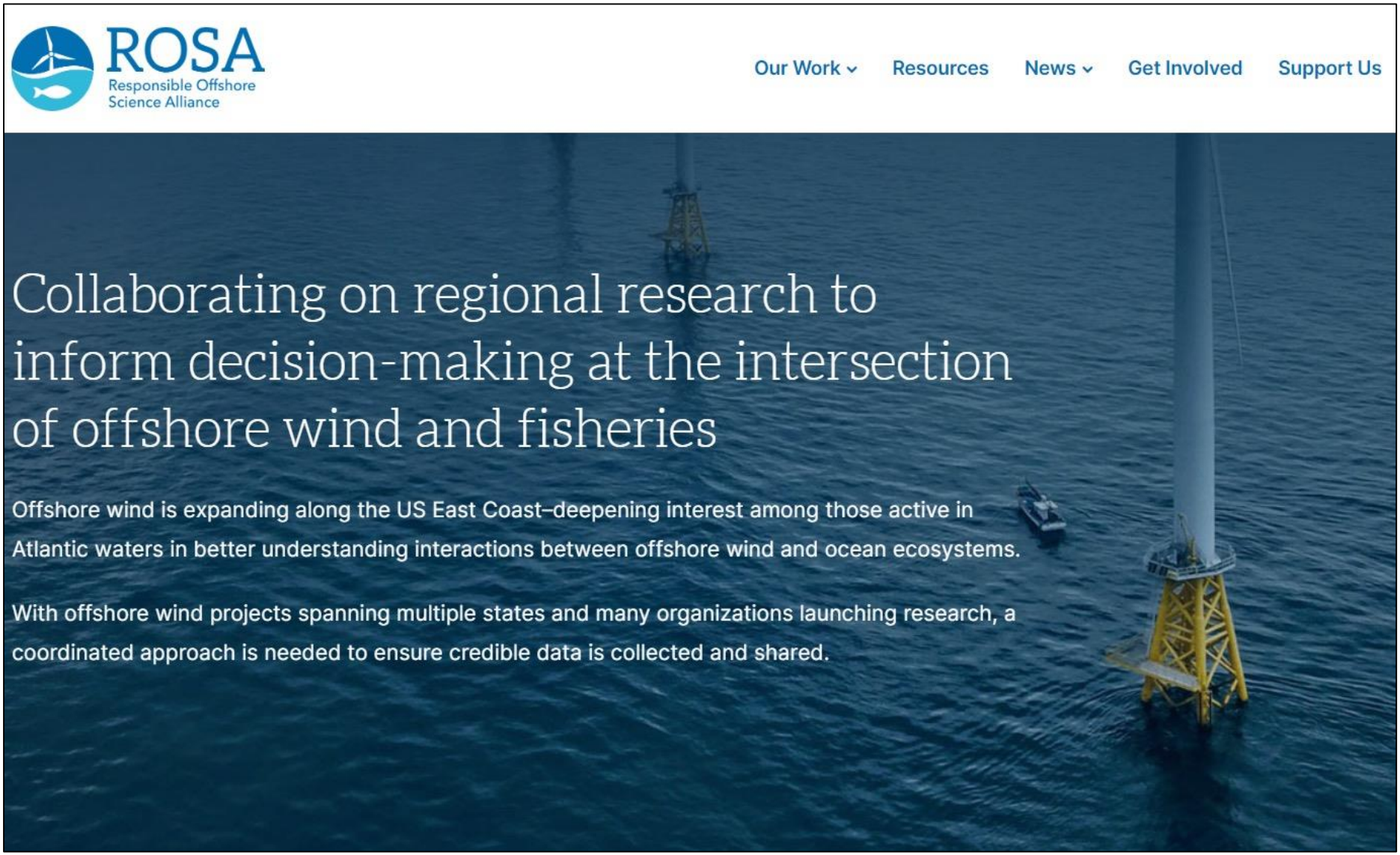
BOEM has funded or considered numerous studies to collect information about the marine environment to support decisions concerning offshore renewable energy development. For more information, please visit: http://www.boem.gov/NJ-Environmental-Studies.

Public Engagement

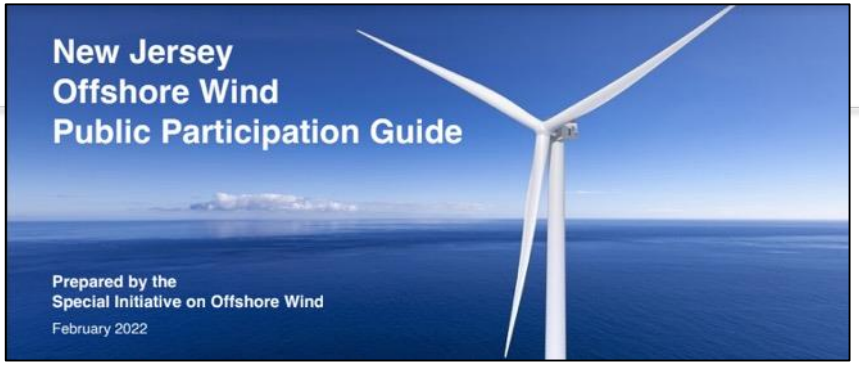
https://www.boem.gov/renewable-energy/state-activities/new-jersey-activities



https://www.nj.gov/dep/offshorewind/index.html



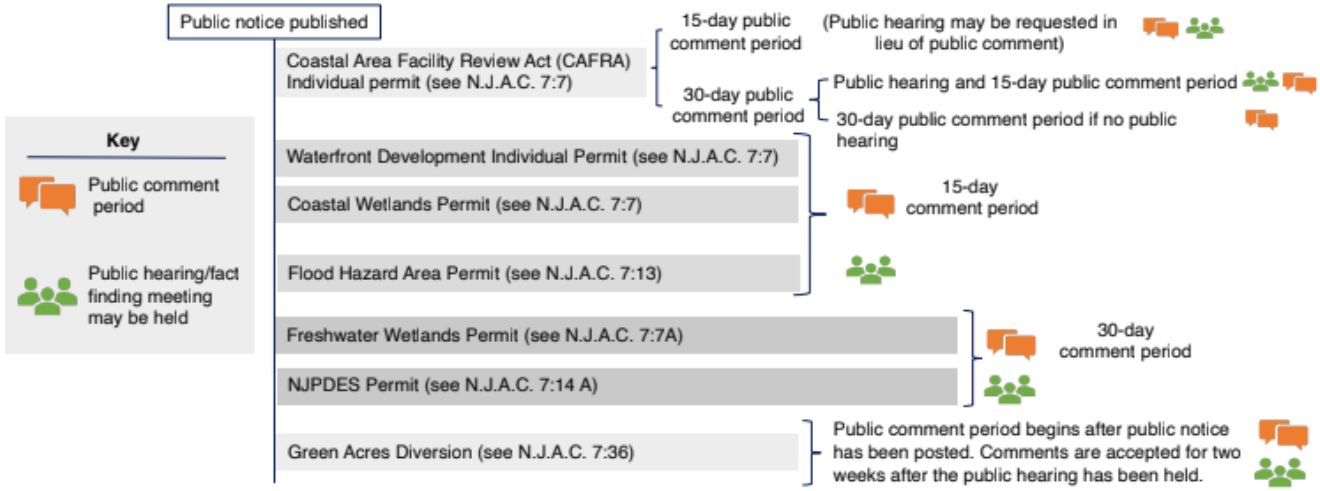
https://www.rosascience.org/



State Permits and Approvals

The following permits or approvals only apply if a portion of an offshore wind project, such as an export cable, falls within state lands or jurisdictional waters. Each approval and permit serves a different purpose in ensuring the conservation of New Jersey's natural resources for the benefit of the people of New Jersey. It is at the discretion of the offshore wind developer as to the timing of submitting the applications for these permits and approvals as they must navigate both federal and state processes while weighing other projects considerations.

Following the submission of an application, the DEP will publish a public notice that the application is available for public review in the NJDEP Bulletin. The date of this publication typically commences a public comment period. The length of the comment period generally varies from 15 to 30 days, depending on the permit or approval. For some permits or certifications, a public hearing or fact-finding meeting may be held by the DEP or may be requested during the public comment period.



Public Comment Period: Allows interested parties, including the public, opportunities to provide formal written comments on permits, certifications, and other state regulatory actions for proposed offshore wind development projects. Comments are accepted via email or by mail and in some cases written requests for a public hearing may be accepted. See NJ Bulletin for notice of public comment periods.

Public Hearing/Fact Finding Meeting: Allows the state regulatory agency to engage in additional fact-finding meetings and opportunities for interested parties, including the public, to provide oral comments and voice concerns regarding proposed activities. A public hearing may be requested during the formal comment period in writing. See NJ Bulletin for notices of public hearings.

https://sites.udel.edu/ceoe-siow/publications/osw-guides/

Questions?

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