MAYFLOWER WIND

Project Update

Presented to

MA EEA Habitat Working Group

Presented by

Erin Healy, Marine Science Permitting Manager, Mayflower Wind

September 14, 2021

Mayflower Wind

Backed by two global energy companies with deep experience in working alongside communities and managing the complexities of offshore and onshore energy development projects

Shell's ambition is to become a net-zero emissions energy business by 2050 or sooner

Ocean Winds – a joint venture of EDP Renewables and ENGIE – share a vision where renewables, particularly offshore wind, play an essential role in the global energy transition

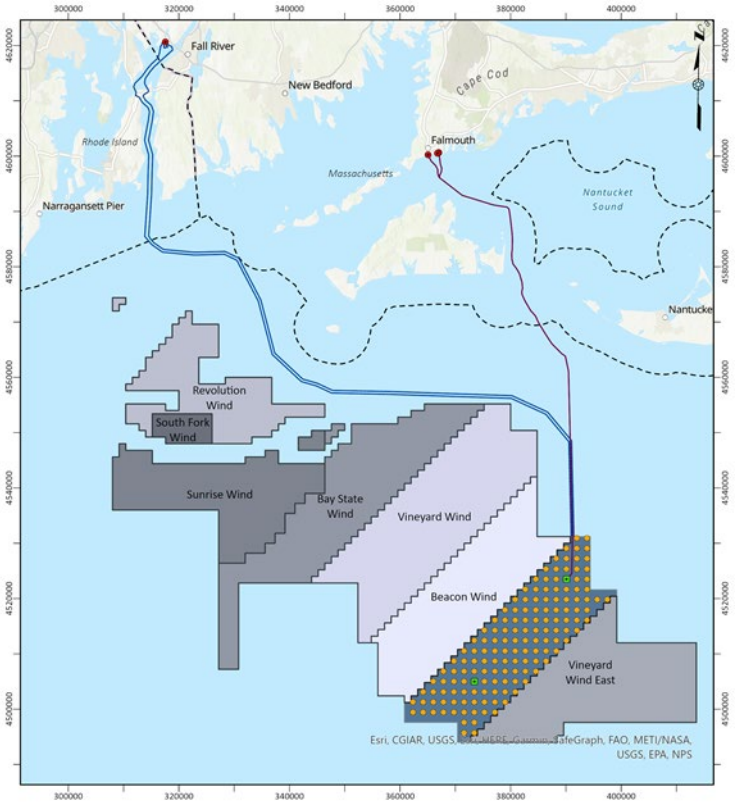
Mayflower Wind Project Overview

Points of Interconnection

- Falmouth Tap
- *New in 2021*: Brayton Point, Somerset

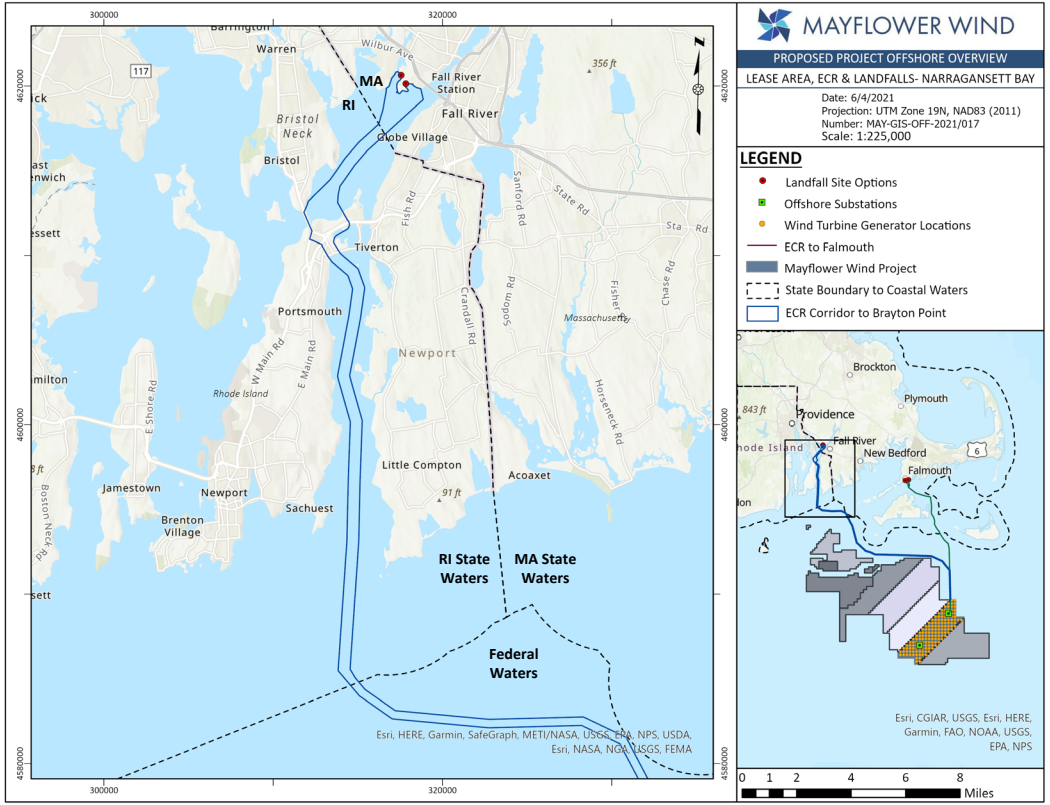
Lease OCS-A 0521

- 127,388 acres
- Up to 149 wind turbine generators (WTG)/offshore substation platform (OSP) positions within the lease area
- 1nm x 1nm spacing



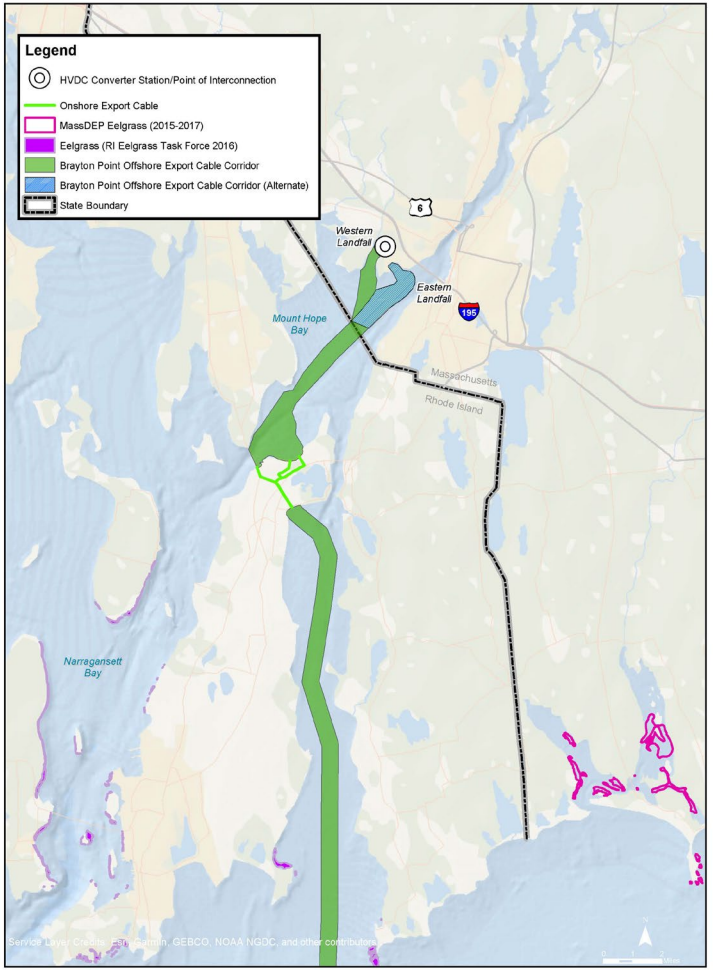
Export Cable Route (ECR) to Brayton Point

- **ECR in Federal Waters:**
  - ~145 km in federal waters
- **ECR in State Waters:**
  - Sakonnet River (~36 km)
    - ~32.5 km in RI state waters
    - ~3.5 km in MA state waters
  - ECR will cross over Aquidneck Island into Mount Hope Bay, entering Massachusetts Waters, and landing at Brayton Point in Somerset, MA



Eelgrass Screening

- No mapped eelgrass data found in Sakonnet River and Mount Hope Bay within vicinity of Brayton Point export cable corridor
  - HDD will be used in nearshore areas to avoid impacts to areas with potential to support eelgrass beds
  - The Summer 2021 benthic surveys verified the absence of SAV beds at the Brayton Point and Aquidneck export cable landing locations



Marine Surveys & Studies for Brayton Point

Schedule

- Started in July 2021

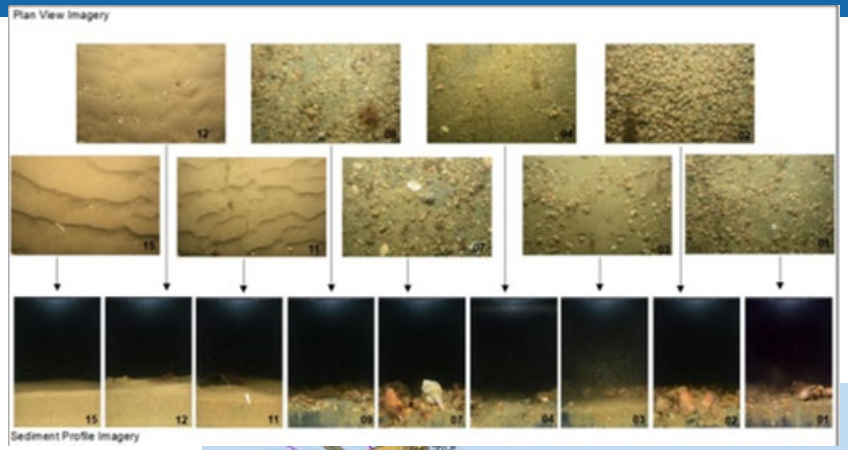
Surveys

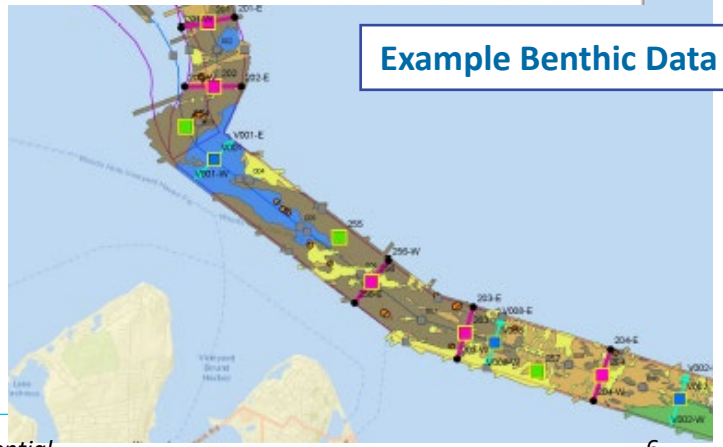
- Sidescan sonar (seafloor)
- Multibeam echosounder (water depth)
- Gradiometer (magnetic anomalies)
- Sub-bottom profiler (approximately 5-meter depth penetration)
- Single channel ultra-high resolution seismic (20-meter depth penetration)
- 2021 Geophysical survey
- 2021 Geotechnical survey
- 2021 Geoarchaeological investigation
- 2021 Benthic sampling program (Summer)
- 2022 Marine Archaeological Resource Assessment
- 2022 Marine Site Investigation Report

Benthic Surveys

Sampling Approach

- Sediment Profile Imaging (SPI)
- Plan View Imaging (PV)
- Video
- Grab samples
  - Grain size
  - Total organic carbon
  - Flora/faunal counts



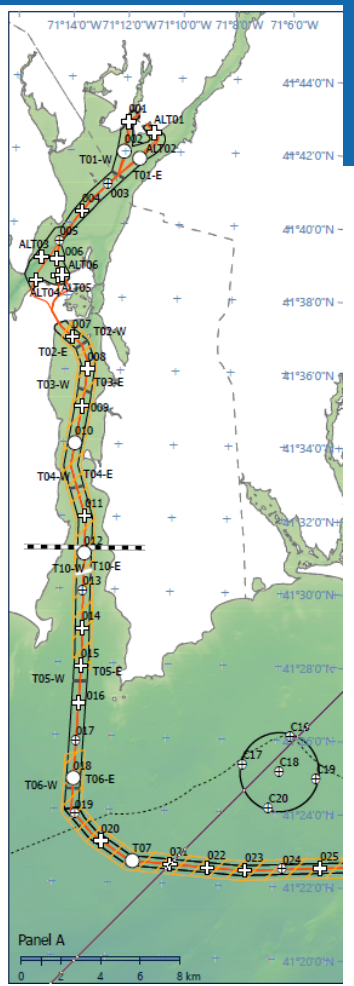


Example Benthic Data

Brayton Pt ECC – 2021 Benthic Sampling

Sample Locations

- <2 km sample station spacing
- Additional focused sampling in sensitive habitat
- Integration with acoustic mapping (when available)



Marine Mammal Protection

Strike Avoidance Measures (All Vessels)

- Vessels greater than 65 feet in length operate at speeds below 10 knots between November 1 and July 31
- Monitor for DMAs and operate at 10 knots or less in DMA areas
- Maintain separation distance of at least 500m with observed North Atlantic Right Whale (NARW) and 100m for other large whales

Incidental Harassment Authorization from NMFS for geophysical surveys

Protected Species Observers (PSOs) on geophysical survey vessels

- Implement IHA procedures
- Monitor during surveys
- Implement mitigation measures if protected species enter "exclusion zone" set by NMFS

Gray Seal

Humpback Whale

Common Dolphin

Thank You

Chinese (Simplified)
English
French
Hindi
Italian
Portuguese
Russian
Spanish

Questions and Comments?

Erin.healy@mayflowerwind.com

Ørsted Offshore North America

Northeast Program Update

Ørsted

MA EEA Habitat Working Group Meeting on Offshore Wind
September 2021

Ørsted Offshore North America portfolio

Awarded over 4,000 MW of offshore capacity on the East coast

In Operation

Block Island Wind Farm: 30MW

Awarded

Revolution Wind: 50/50 JV w/ Eversource, 704MW (400MW to RI, 304MW to CT)
South Fork Wind: 50/50 JV w/ Eversource, 132MW
Sunrise Wind: 50/50 JV w/ Eversource, approximately 924MW
Ocean Wind 1: 75/25 JV with PSEG, 1,100MW
Ocean Wind 2: 1,148MW
Skipjack Wind 1: 120MW

Orsted Northeast Program
50/50 JV with Eversource

South Fork

- Lease Area OCS-A 0517
- Deliver power to the East Hampton, NY
- FEIS issued August 2021
- NY Article VII approved March 2021

Revolution

- Lease Area OCS-A 0486
- Interconnect to the existing Davisville Substation, RI
- NOI issued April 2021, scoping ended June 11, 2021

Sunrise

- Lease Area OCS-A 0530
- Proposed interconnection at Holbrook Substation, NY
- NOI issued August 2021
- Scoping Meetings: September 16 (5:30) / 20 (1:00) / 22 (5:30)
- Comments due October 4

Thank you

Liz Gowell
Head of Strategic Permitting
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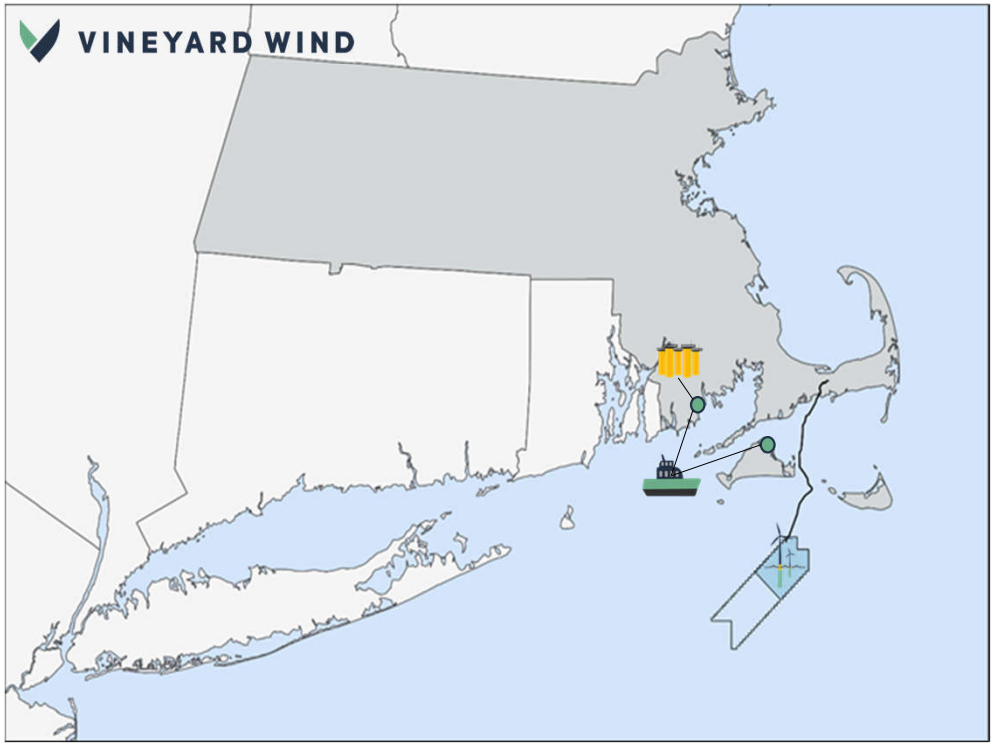
Ørsted


VINEYARD
WIND
Project Updates
September 14, 2021

Vineyard Wind 1

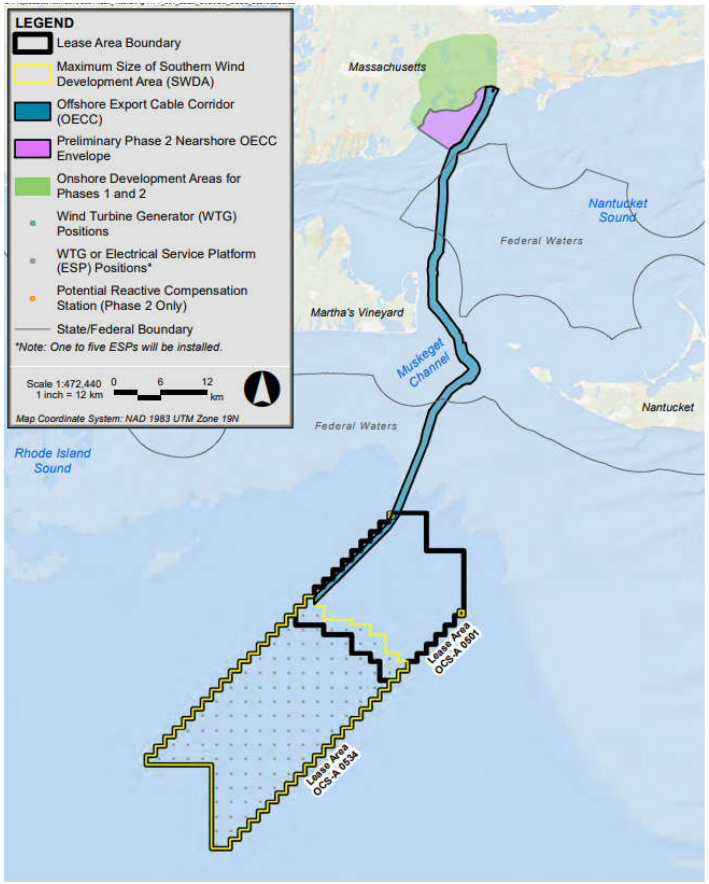


Overview

- **Capacity:** 800 MW
- **Lease Area:** OCS-A 0501
- **Federal Permitting:** Complete, COP Approval received July 15, 2021
- **State Permitting:** Complete
- **Point of Interconnection:** Barnstable Substation (MA)
- **Power Purchase Agreements:** 20-year PPAs with Massachusetts utilities (approved)
- **COD**: 2024

VINEYARD WIND

Vineyard Wind South

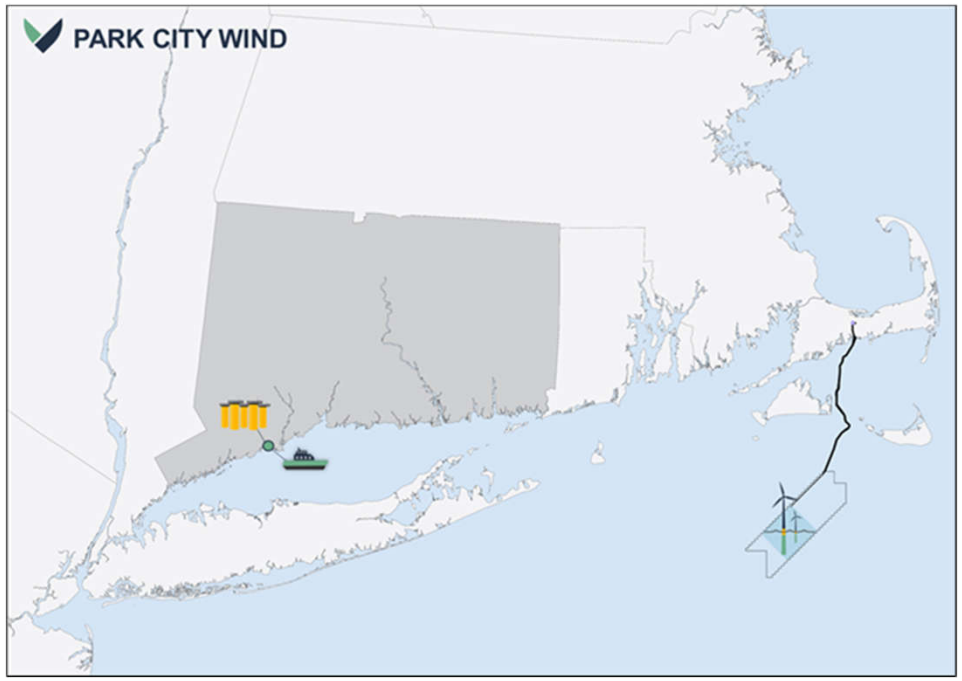


Overview

- **Location:** Vineyard Wind South is in Lease Area OCS-A 0534, which is located immediately to the south of Vineyard Wind 1. Vineyard Wind South facilities are located in federal and Massachusetts state waters. WTGs and ESPs located in Southern Wind Development Area (SWDA)
- **Two Phases:** Maximum of 140 WTGs and ESPs
  - **Phase 1** is Park City Wind
  - **Phase 2** is Rest of Zone/Future Project
- **Development:** Each Phase has its own Project Design Envelope
- **Size:** SWDA approximately 370-486 km2

VINEYARD WIND

Park City Wind



Park City Wind includes a commitment to base construction and operations activities primarily out of Bridgeport, Connecticut

Overview

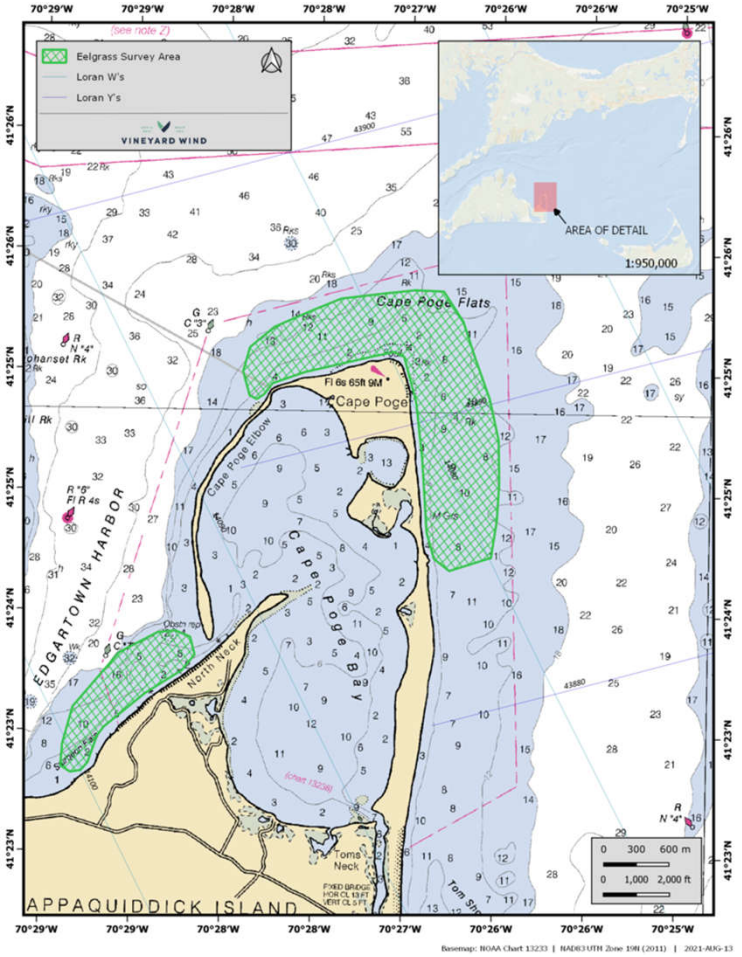
- **Capacity:** 804 MW
- **Lease Area:** OCS-A 0534
- **Federal Permitting:** EIS Scoping meetings July 2021
- **State Permitting:** Draft EIR Certification
- **Point of Interconnection:** West Barnstable Substation (MA)
- **Power Purchase Agreements:** 20-year PPAs with Connecticut utilities (approved)

VINEYARD WIND

Environmental Studies

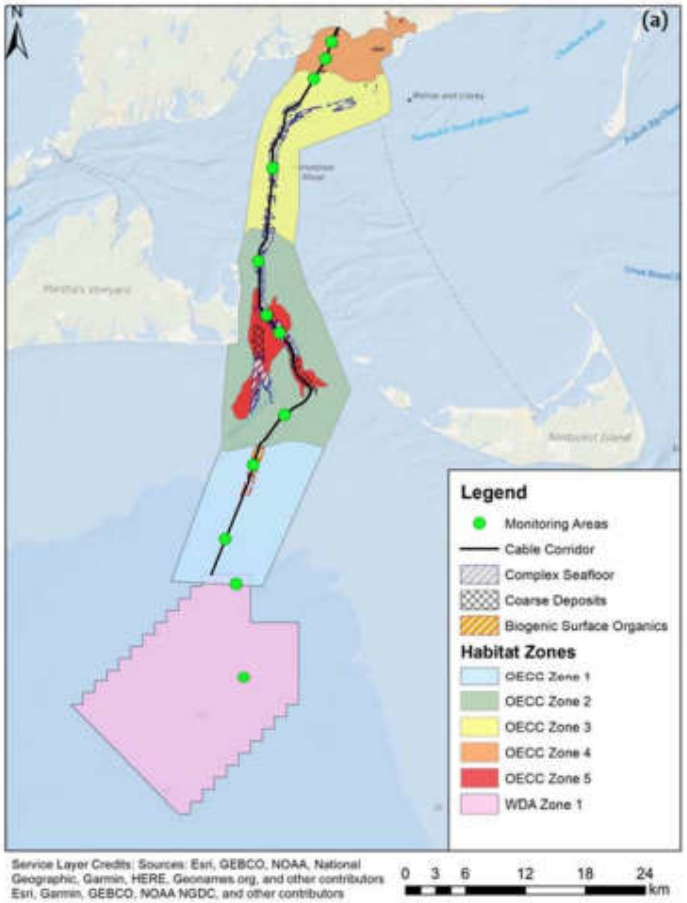
Eelgrass Study

- **Objective**: Map extent of eelgrass beds surrounding Cape Poge before and after export cable installation for Vineyard Wind 1
- **Frequency:** Baseline, year one and three post-construction
- **Methods**: Visual observation, echograms, underwater video and still images, SCUBA divers/snorkelers



VINEYARD WIND

Environmental Studies



VINEYARD WIND

Benthic Habitat Monitoring

- **Objective:** Document benthic habitat, benthic communities, and sand lance along export cable route and within wind development area before and after construction and installation of Vineyard Wind 1
- **Frequency:** Baseline survey, year one and three post-construction
- **Methods:** Multibeam depth sounder, underwater video, grab samples

Questions?

Thank you

VINEYARD WIND

Marine Mammal and Sea Turtle Science Initiatives Northeast Program

Ørsted

Laura Morse

MA-HAB

September 14, 2021

NOAA MOA UPDATE

- About
  - Sharing, Archiving, and Distributing Project Approved Non-Proprietary Datasets
  - January 15, 2021 - September 30, 2025
  - Data themes: Air quality, water quality, and emissions' Biological communities; Meteorology; Coastal and ocean currents, circulation, and waves; Hydrographic services and mapping; Physical oceanography
  - NOAA provided guidelines on best practices for data/metadata to NOAA data repositories

- Next Steps
  - Engage with NOAA line offices to identify specific data streams of mutual interest and value
  - Utilize existing and public facing pathways and repositories (e.g. NCEI) for sharing and archiving data
  - Engage with NOAA/IOOS funded Regional Associations (MARACOOS and NERACOOS) and Regional Ocean Councils (NROC and MAROC) to identify data types and data products of value to regional stakeholders and further facilitate streamlined data share

Atlantic Marine Conservation Society (AMSEAS) Seal Tagging
PI: Rob DiGiovanni

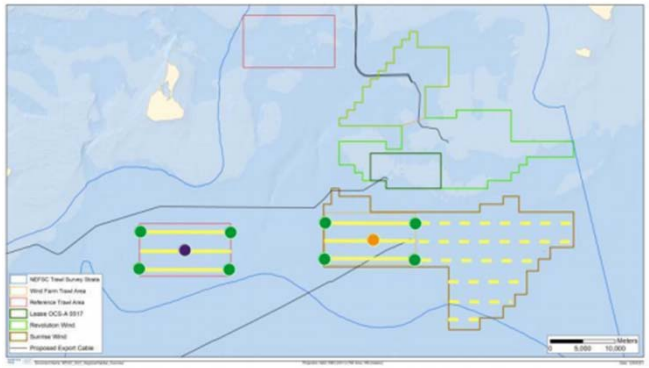
- Project Goal: Contribute to assessments of habitat usage of harbor and gray seals in southern New England waters and the New York Bight, including OSW project areas.
- Funding 5+ years of tags for use with harbor and grey seals; option to include sea turtle tagging.
- ~10 Acoustic and ~10 satellite tags per year:
  1. The acoustic tags will communicate with an existing underwater acoustic receiver array, and tag numbers will be shared with other researchers through the Animal Tracking Network.
  2. The satellite tags will collect location, temperature, haul-out behavior, dive depth and duration.
- Supports larger collaborative project underway with with the Naval Undersea Warfare Center; Marine Mammals of Maine, Northeast Fisheries Sciences Center and staff at the Marine Sciences Center of Stony Brook University.
- Tagging to be conducted under permits secured by AMSEAS or collaborators.
- Tagged animal tracks will be available in real-time on AMSEAS website.

ATLANTIC MARINE CONSERVATION SOCIETY

Promoting Marine Conservation Through Action

Stony Brook North Atlantic Right Whale Prey Study: PI's: Dr. Joe Warren and Dr. Lesley Thorne

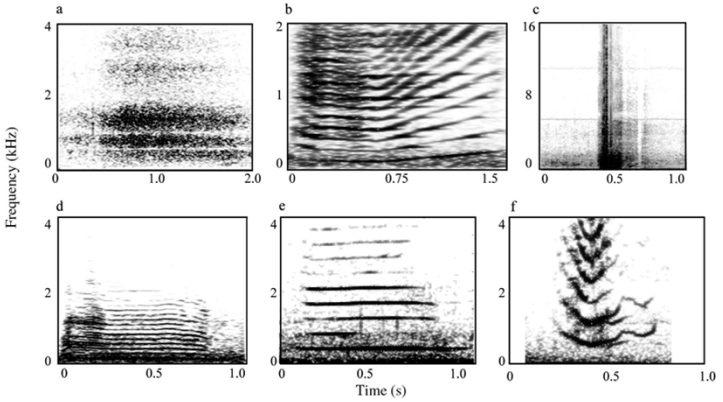
- Project Goal: Using net tows and active acoustic techniques, assess and quantify spatio-temporal dynamics of zooplankton in waters of the Southern New England Shelf and New York Bight, with a focus on the Sunrise Wind Farm area, and integrate zooplankton data into habitat models for NARW to improve our predictive capacity for NARW in OSW areas in both space and time.
- Initial funding for two years; option to extend project or integrate into wider regional efforts (e.g. RWSE, DOE, NEFSC funded studies):
  - Stationary year-round measurements (bottom lander with upward facing echosounder).
  - Four Vessel based seasonal surveys/year with echosounders; vertical ring net tows; CTD profiles; lipid content measured from copepod sub-samples.
  - Measurements at control site that will also be used as control site for Sunrise Fisheries studies.
  - Desktop analysis of existing historic zooplankton data in the region.
  - Initiate development of predictive models for NARWs in collaboration with regional partners at Rutgers (Dr. Josh Kohut), NEAQ (Dr's Jessica Redfern and Dan Pendleton) and the Bigelow Laboratory (DR. Nicholas Record).
- Stony Brook will collaborate with other Orsted funded projects including Syracuse University/Susan Parks; Rutgers University (ECO-PAM project); and all Ørsted funded fisheries surveys.



Stony Brook University

Syracuse University Baleen Whale Acoustic Ecology
PI: Dr. Susan Parks

- Multi-Project Goals: advance understanding of baleen whale acoustic ecology and impacts of underwater noise; advance analytical techniques to enhance the application of acoustic monitoring for offshore wind development needs; and provide funding support for NYS undergraduate and graduate student research in these areas of interest.
- Funding for 5 years; 200k/year
- Year 1-2 Projects Planned:
  - Acoustic Density Estimation: Using machine learning approaches to improve acoustic density estimation of marine mammals from passive acoustic data. We can explore multiple analysis approaches to determine the feasibility of this approach to count right whales based on call subtle differences in the calls of individuals.
  - Opportunistic Focal Data Collection: Collecting opportunistic acoustic data with a floating GPS acoustic array to determine call types, call rates, and associated behavior for baleen whales in wind lease areas. This project would be in collaboration with Stony Brook for deployment of equipment and Woods Hole and Loggerhead Instruments for equipment development use their developing Medusa system (low cost floating recorders with GPS position data in real time) deployed in a floating array of buoys when species of interest are located.
- Year 2+ projects will be developed year to year



Parks et al., 2011: Eubalaena glacialis. Examples of sounds recorded from tagged right whales stereotyped as (a) exhalation, (b) upcall, (c) gunshot, and variable tonal calls: (d) low-frequency tonal (F0 < 100 Hz), (e) mid-frequency tonal (100 < F0 < 300 Hz), (f) high frequency tonal (F0 > 300 Hz).

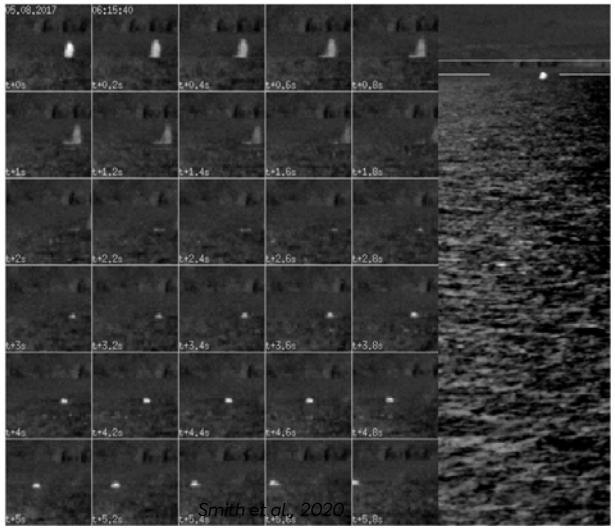
Syracuse University

Sunrise Wind | Powered by Ørsted & Eversource

Ørsted

Stony Brook Thermal Camera Marine Mammal Automated Detection Project - PIs: Dr. Alexander Borowicz; Dr. Lesley Thorne

- Project Goal: Develop standards and evaluation of autodetection capability for thermal camera systems for detecting marine mammals from platforms associated with offshore wind development, construction and operation.
- Funding for one year
  - Understand the feasibility and limitations of the automated classification of thermal imagery for at-sea whale detection;
  - Develop a training and validation set of images sourced from pre-existing thermal imagery associated with marine mammal observations that could be used to evaluate or develop different autodection models;
  - Set benchmarks for model performance; and
  - Provide advice and guidelines for the standards of evaluation and implementation for machine-learning image classification models, the interpretation of model outputs and error, and the construction of such models for use in a dynamic, at-sea operational environment.
- Project leverages PI's expertise in Machine Learning and Artificial Intelligence (AI) application for remote detection of wildlife (e.g. SPACEWHALE project).



Stony Brook University

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Mystic Aquarium

- Studies in Development

- Study Areas:
  - Animal Rescue Program
    - Stranding program support
    - Tagging of rehabilitate animals

  - Research Team
    - Physiology/Health Assessment studies
    - E-DNA studies

ECO-PAM: Ecosystem and Passive Acoustic Monitoring Project

Advancing technology for protection and conservation of North Atlantic right whales

Slocum Glider

Rutgers:

- 2 years of Slocum Glider Missions
- Suite of passive acoustic and oceanographic sensors
- Includes VEMCO receivers (fish tag detection)
- Characterize habitat for NARWs and develop predictive models
- Contribute oceanographic measurements in real time to NOAA that improves real-time weather forecasts including major storm events
- ECO puck; CTD; Dissolved Oxygen
- Integration with Mysticetus and Whale Alert

WHOI DMON Buoy

WHOI:

- 2 near real time WHOI Buoys for 2 years (NJ and New England)
- Includes VEMCO receivers for detecting tagged fish
- R&D to advance sensor capability to be able to directionalize on calls
- Integration with Mysticetus and Whale Alert

URI:

- 1 test buoy (Spring 2021)
- Designed by students in collaboration with researchers
- Will advance sensors capability to directionalize on calls