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Beacon Wind

Julia Lewis
EEA Habitat Working Group on Offshore Wind Energy
February 26, 2021

Beacon Wind | Equinor US Wind

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UNITED STATES

Boston

Stamford

Atlantic Ocean

Empire Wind

Beacon Wind

UNITED STATES WIND

LEGEND

- Equinor Wind lease
- Other wind lease
- Equinor Office

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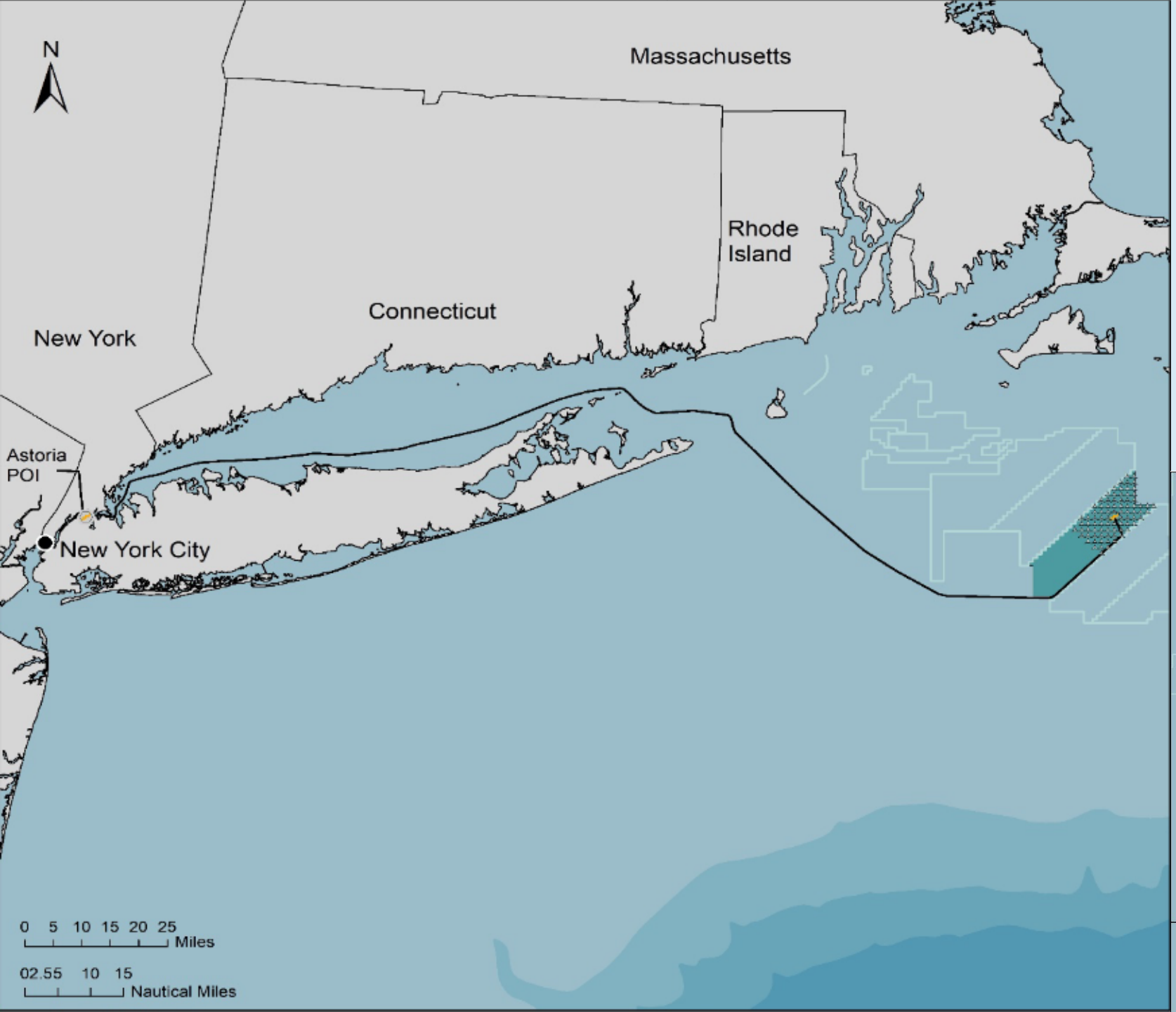
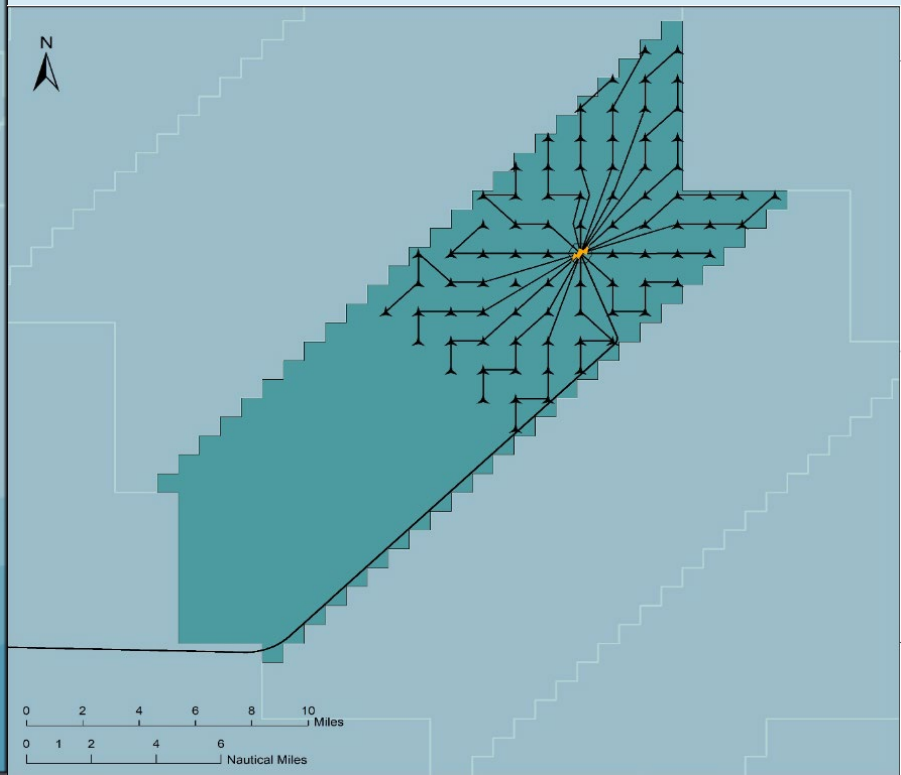
Energy Procurements Update:

- January 2021: New York awarded 1,230 MW to Beacon Wind 1 with landfall at Astoria, NY

Beacon Wind 1





Route Consultations

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NEW BEDFORD PORT AUTHORITY
Palmers Light Est. 1849

NEW YORK STATE

CITIZENS CAMPAIGN FOR THE ENVIRONMENT

CRMC
Coastal Resources Management Council

Save the Sound®
Action for our region's environment.

CONNECTICUT ENERGY ENVIRONMENT

MASSACHUSETTS LOBSTERMEN'S ASS'N.

NATIONAL WILDLIFE FEDERATION
SINCE 1936

UNITED STATES COAST GUARD
SEMPER PARATUS
1790

BOEM
Bureau of Ocean Energy Management

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
U.S. DEPARTMENT OF COMMERCE
NOAA FISHERIES

COMMERCIAL FISHERIES CENTER OF RHODE ISLAND

Long Island Sound Study
A Partnership to Restore and Protect the Sound

US Army Corps of Engineers®
New York District

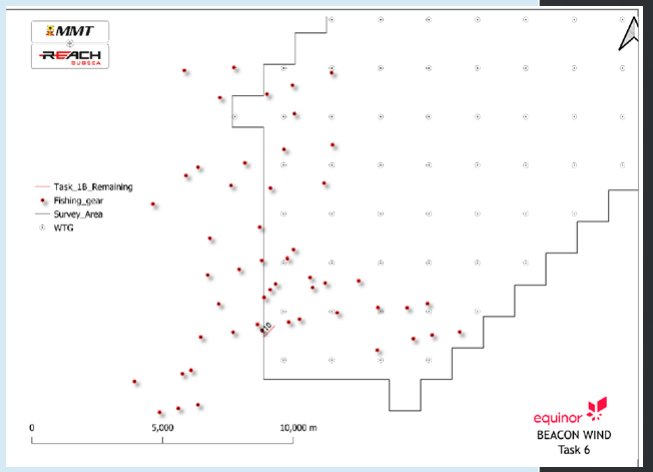
The Nature Conservancy

Beacon Wind | 2020 HRG Surveys

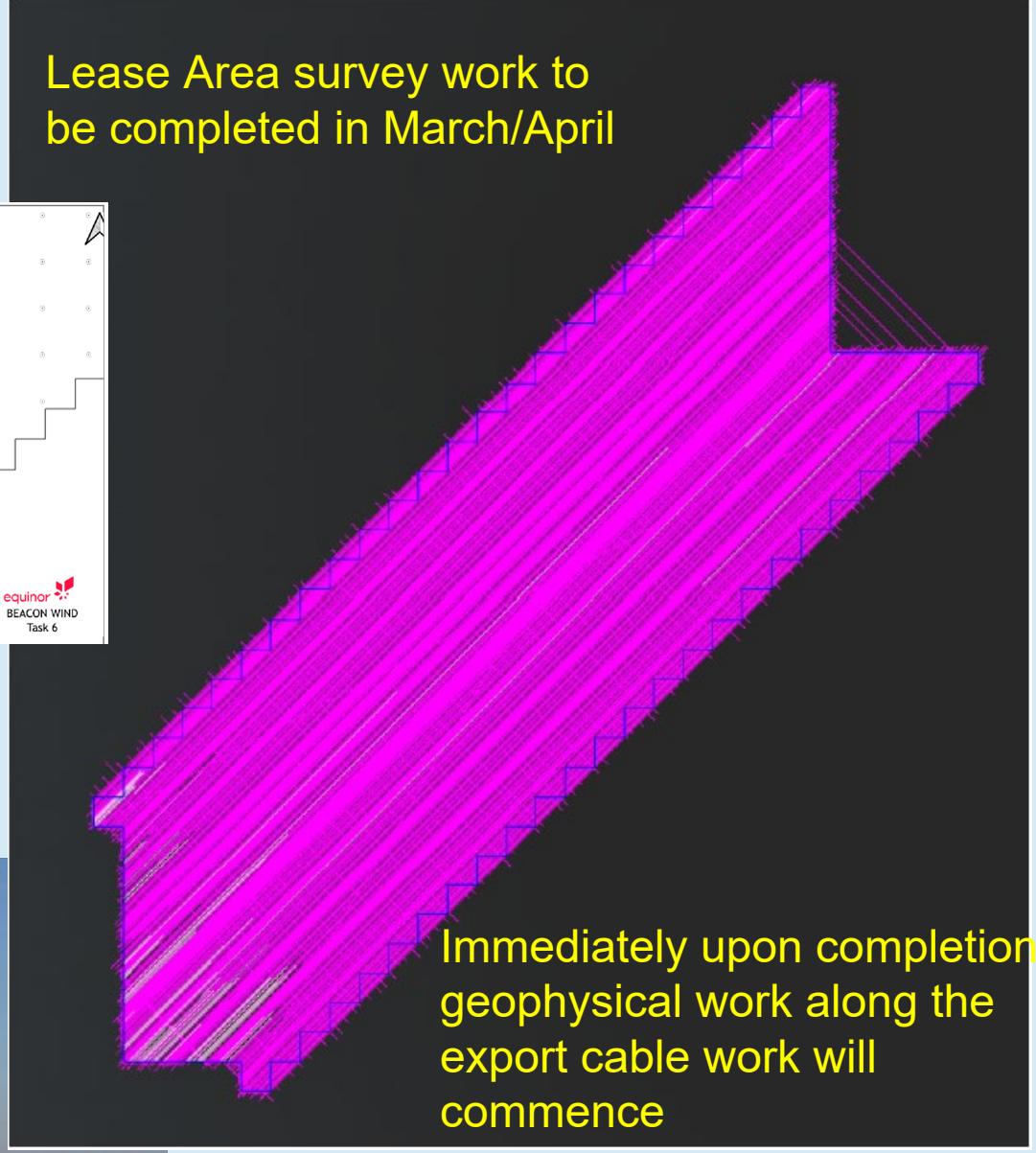
HRG Survey Scout Boat Program

Mobilized: August 4th
Progress as of: January 25, 2021

- Fishing vessel hired to assist clearance of survey lines
- Assists in communications with other vessels and waterway knowledge for survey vessel



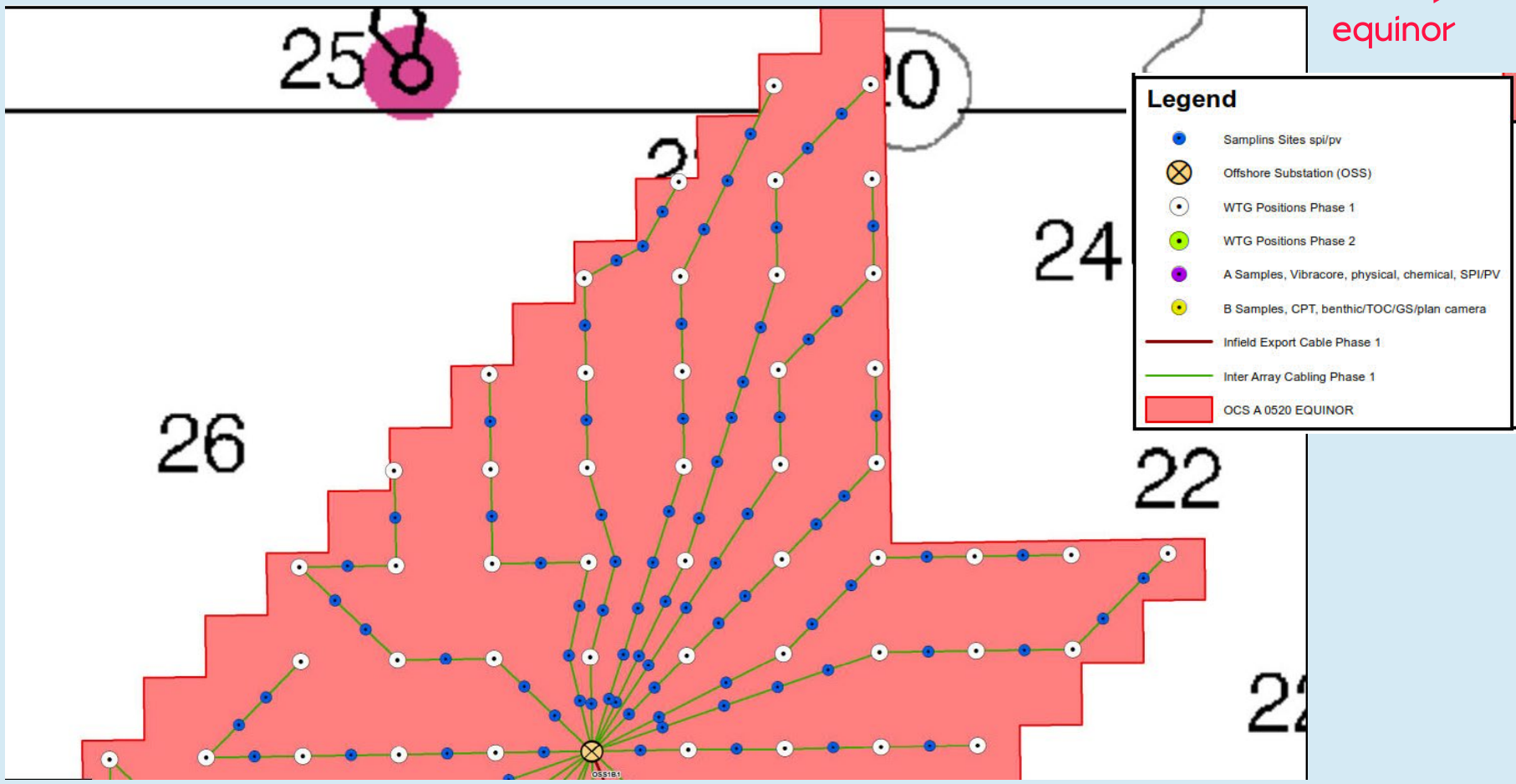
Lease Area survey work to be completed in March/April



Immediately upon completion geophysical work along the export cable work will commence

Spring 2021 Seafloor Sampling Program Objectives

- Characterize physical and chemical condition across Lease Area and export cable route
- Ground truth geophysical survey
- Inform engineering and installation planning
- Support federal and state permitting
  - Article VII Application
  - Water Quality Certification
  - Construction & Operation Plan (full build out)
  - Section 10/404 Permit
  - Federal Consistency Review
- Contractor selection is in progress



Along Export Cable Route:

- **"A" Stations**
  - Vibracores & SPI/PV imagery
- **"B" Stations**
  - CPTs & Benthic grabs w/ plan view video

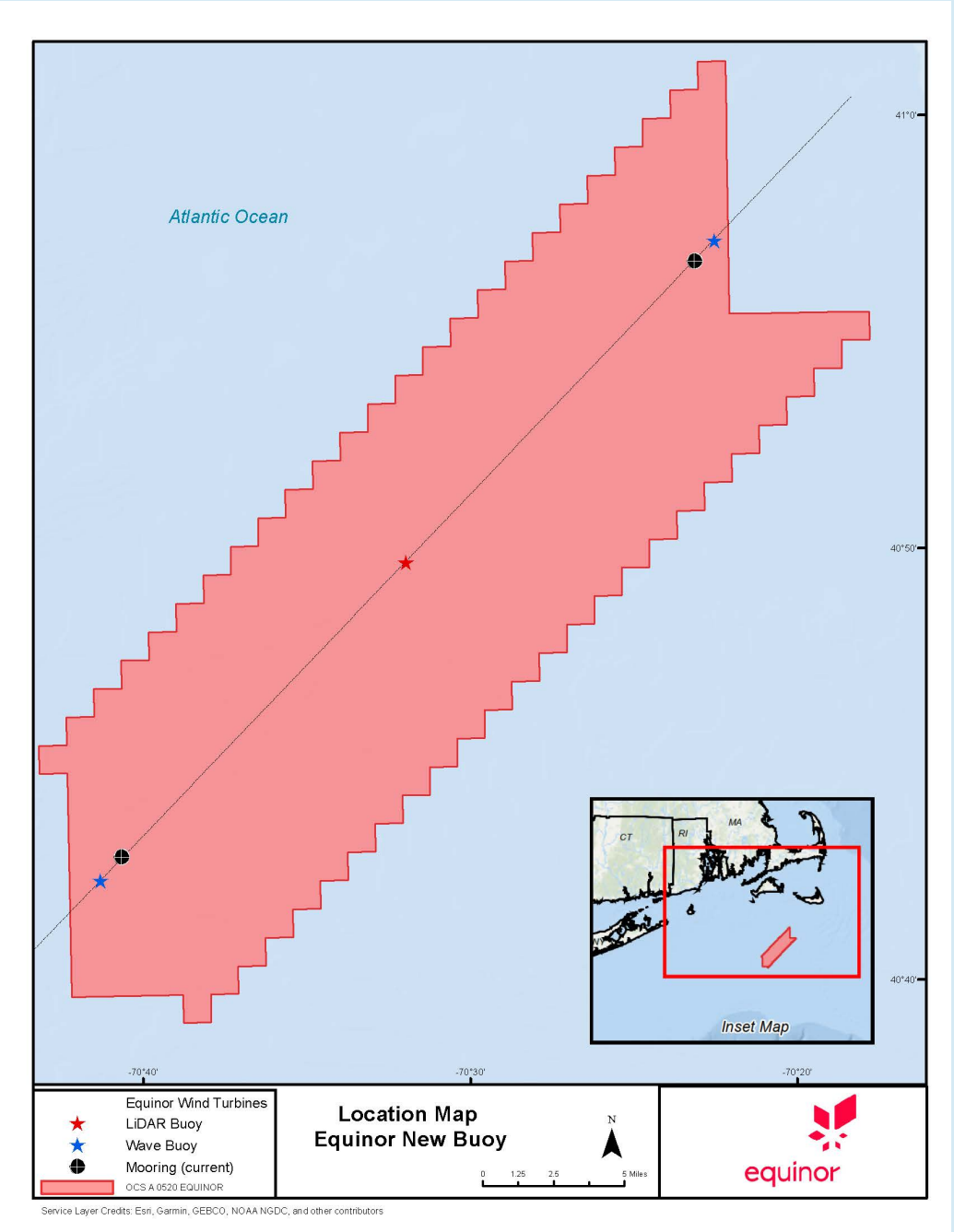
2021 Sampling Program

SAP Overview

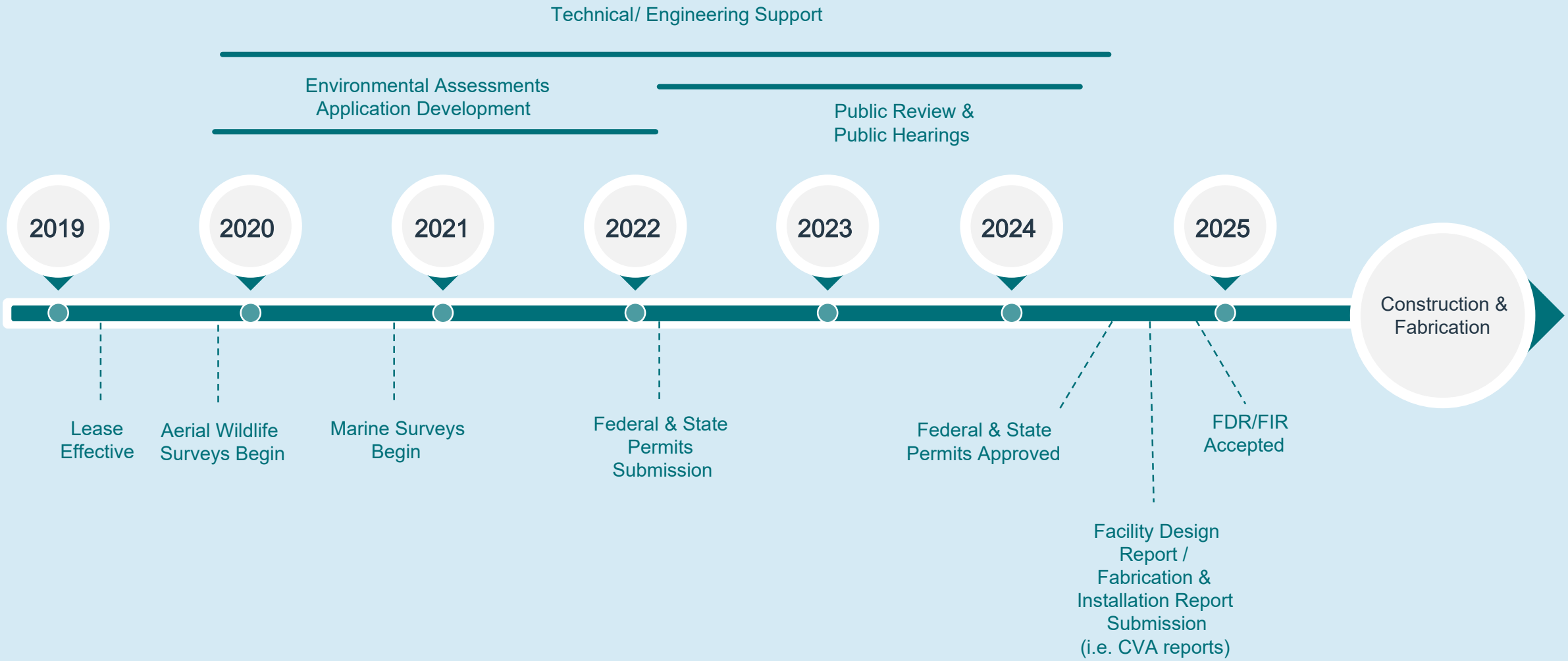
- Site Assessment Plan (SAP) in support of the installation and operation of:
  - One Floating Light Detection and Ranging (Floating LiDAR) buoy,
  - Two current meter moorings, and two wave and metocean buoys

- The proposed approach is to utilize the LiDAR buoy formerly located in Equinor Wind's New York Lease OCS-A 0512 (Empire Wind).

- The facilities will be moved to Equinor Wind's Massachusetts Lease OCS-A 0520 following all permitting approvals.



Beacon Wind | Permitting Schedule



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SHAPING THE FUTURE OF ENERGY

Thank you for your attention

Julia Lewis
julew@equinor.com

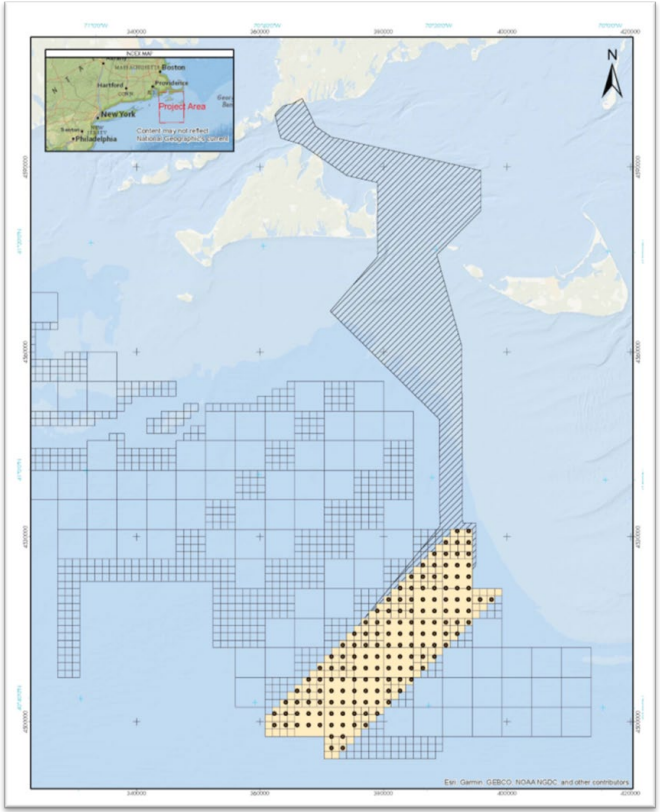
MAYFLOWER WIND

MA EEA Habitat Working Group Update

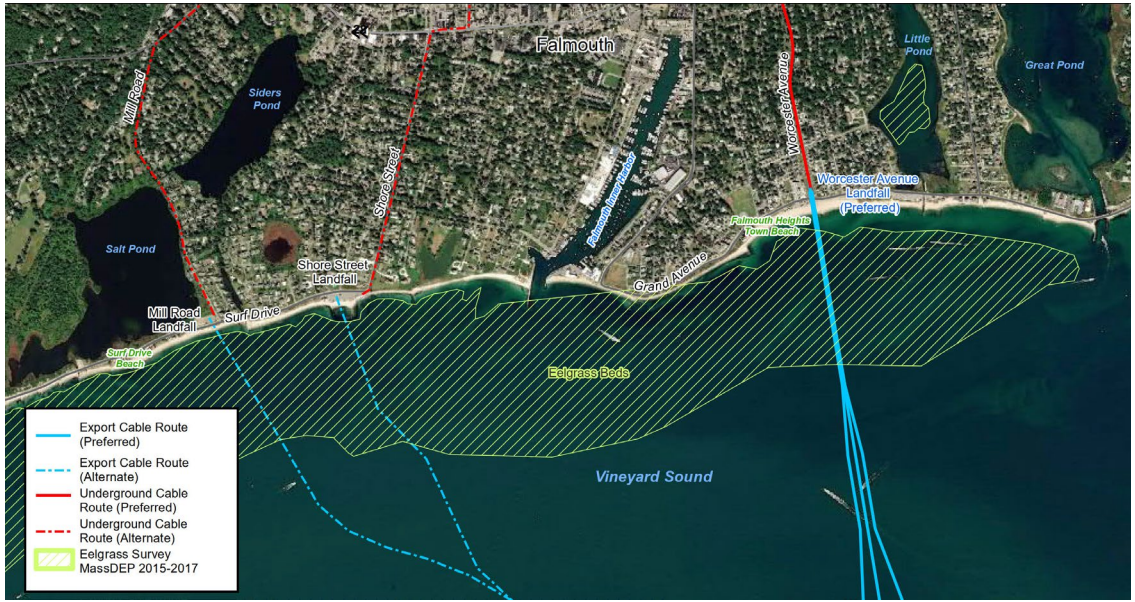
February 26, 2021

Mayflower Wind Milestones

- 2020 G&G Survey Plan approved by BOEM
- Agreed to 1x1 nm grid layout with other MA/RI developers
- SAP approved by BOEM in May 2020
- High-resolution geophysical surveys conducted May-November
- Geotechnical and geoarchaeological surveys conducted July-September
- Virtual geoarchaeological core testing in consultation with BOEM, BUAR, MHC and Tribes, completed Fall 2020
- Benthic surveys conducted in spring, summer, and fall 2020

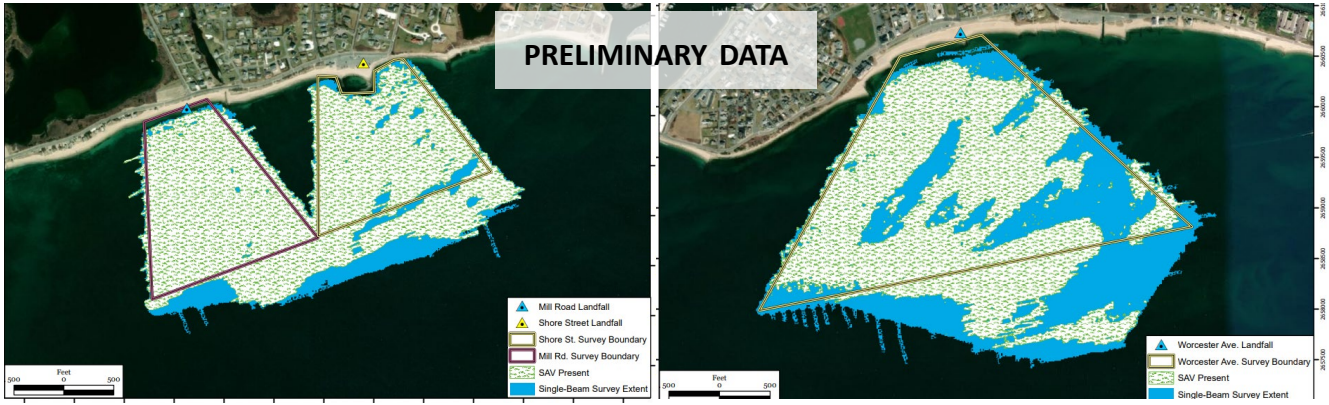


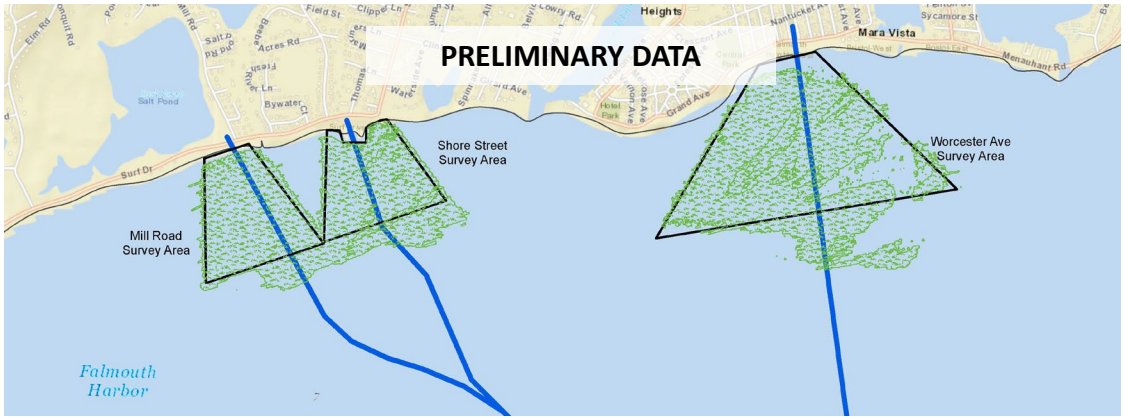
State Eelgrass Surveys



- Eelgrass (Zostera marina) and other submerged aquatic vegetation (SAV) serve as EFH for finfish and shellfish, stabilize shorelines, and is a SSU resource under the MA Ocean Management Plan
- Statewide mapping program by MassDEP since 1994 using remote sensing methods and ground truthing for QA/QC
  - Most recent phase for South Shore of Cape Cod completed in 2015
- Mayflower plans to use HDD for submarine export cable landing to avoid/minimize impacts to eelgrass

Mayflower Eelgrass Survey – Preliminary Reports

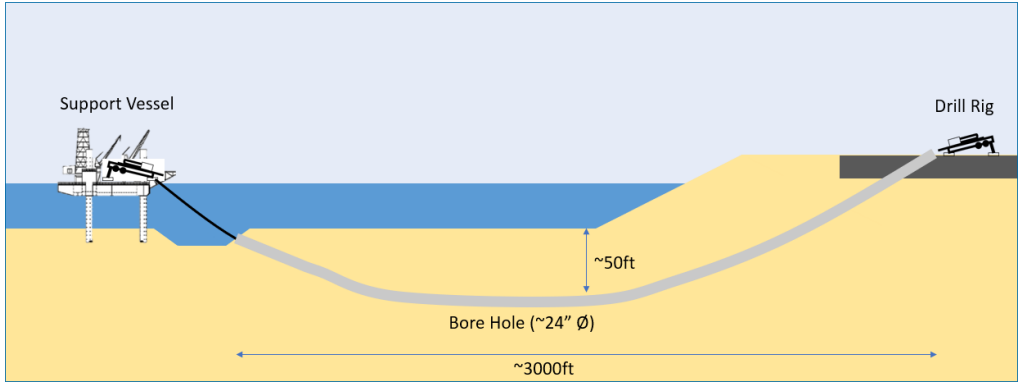




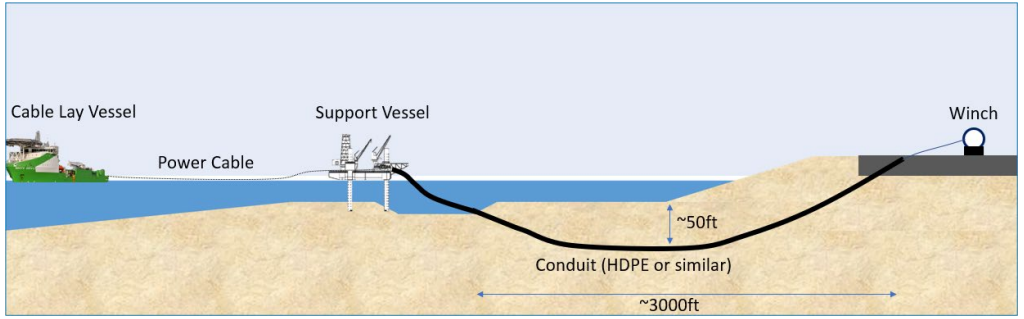
- Conducted August 6th to August 24th 2020
- Subcontracted inshore vessel (25 ft Cyprinodon)
- High frequency side scan sonar & underwater video confirmation
- Required for COP, Federal, and State Permits

Cable Landfall via HDD

- Following the guidance of the Massachusetts Ocean Management Plan, Horizontal Directional Drilling (HDD) will be employed to **avoid impacts to sensitive environmental resources**, including beaches and nearshore eelgrass beds.
- Permanent surface impacts will be minimal and away from the beach – onshore cable vaults will be buried.
- A Comcast-Eversource hybrid fiber optic and 25 kV electric cable was successfully installed near Mill Road in 2014 using HDD with **no negative impacts**.

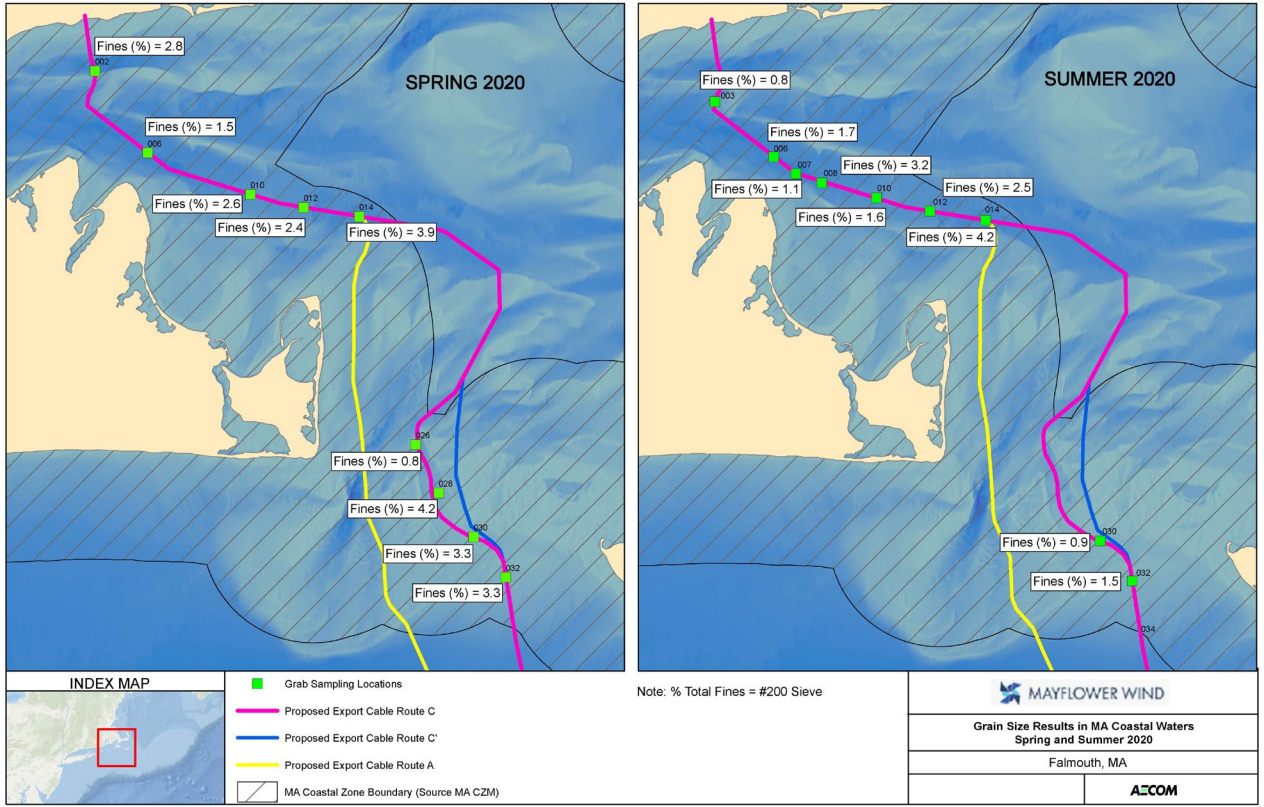


Horizontal Directional Drilling (image courtesy of DEME Offshore US)



Cable Pull-In (image courtesy of DEME Offshore US)

Sediment Grainsize Analyses – Preliminary Data



- Sediment grain size distribution from grab samples Spring and Summer surveys
- All samples in MA state waters show less than 10 percent fines (#200 seive)

Thank You

We Welcome Questions!

erin.healy@mayflowerwind.com

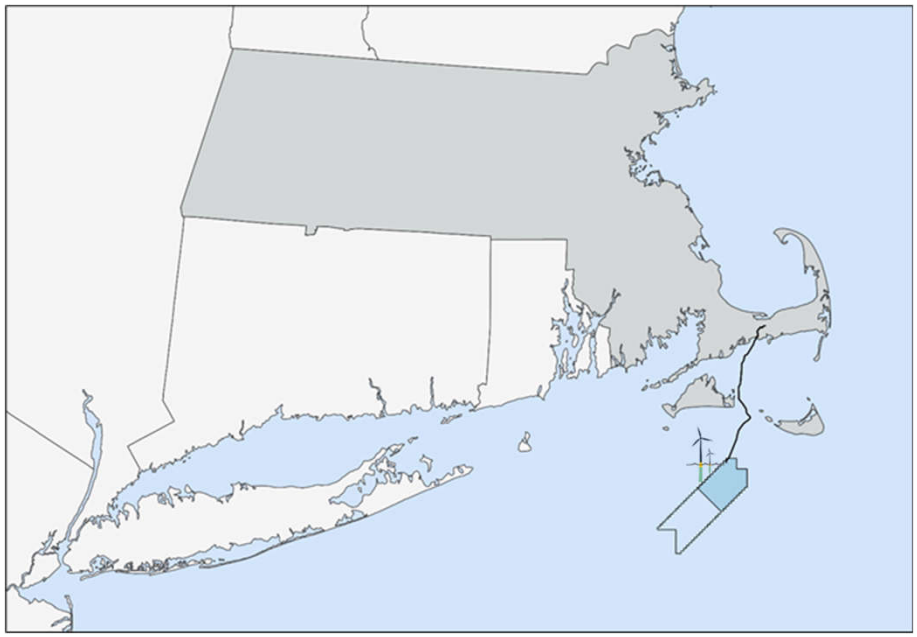
mayflowerwind.com


VINEYARD
WIND
Project Updates
February 26, 2021

Vineyard Wind 1

Overview

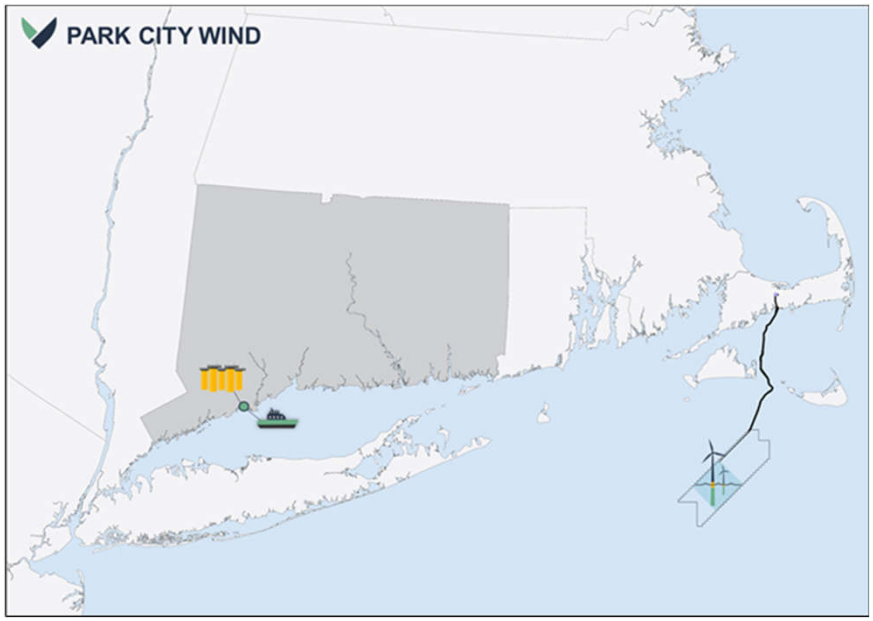
- **Capacity:** 800 MW
- **Lease Area:** OCS-A 0501
- **Turbine Model:** 13 MW GE Haliade-X
- **Federal Permitting**
  - Due Diligence: Haliade-X
    - January 2021, results of review determined no changes needed to COP
  - BOEM has resumed federal review
- **State Permitting:** Completed
- **Point of Interconnection:** Barnstable Substation (MA)
- **Power Purchase Agreements:** 20-year PPAs with Massachusetts utilities (approved)
- **Commercial Operation:** Anticipated in late 2023



Vineyard Wind 1 is on track to be the nation's first commercial-scale offshore wind project

VINEYARD WIND

Park City Wind



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

Overview

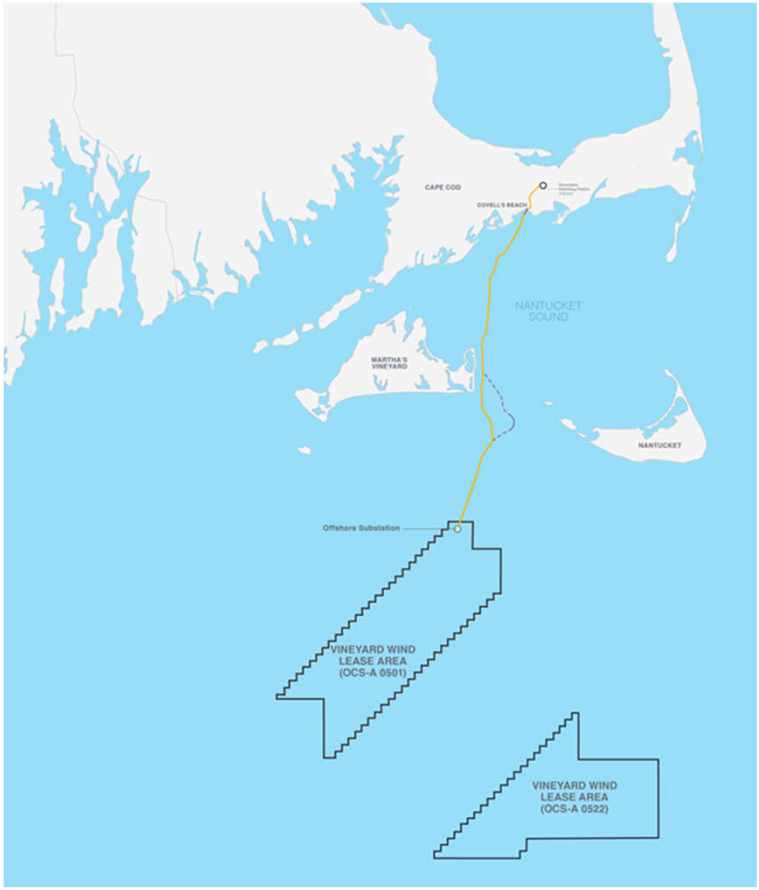
- **Capacity:** 804 MW
- **Lease Area:** OCS-A 0501
- **Federal Permitting:** COP filing expected to be completed mid-2021
- **State Permitting:** EFSB review estimated to be complete end of 2021. Draft EIR under development.
- **Point of Interconnection:** West Barnstable Substation (MA)
- **Power Purchase Agreements:** 20-year PPAs with Connecticut utilities (approved)
- **Commercial Operation**: Anticipated in 2025

VINEYARD WIND

Lease Area OCS-A 0522

Site Assessment Plan (SAP)

- SAP submitted to BOEM on March 6, 2020 and Vineyard Wind is currently finalizing SAP approval items
- Working on metocean buoy deployment



VINEYARD WIND

Environmental Monitoring

Fisheries Surveys

- Second year of pre-construction surveys in both lease areas ongoing; led by UMass Dartmouth's School of Marines Science and Technology
  - Trawl surveys (4 times per year); drop camera surveys (2 times per year); lobster, plankton, black sea bass surveys (June – October)
- Highly Migratory Species study in partnership with New England Aquarium Anderson Cabot Center for Ocean Life completed
- Data available at: https://www.vineyardwind.com/fisheries

Aerial Digital Surveys

- Aerial digital surveys ongoing in OCS-A 0522; led by APEM and Biodiversity Research Institute
  - Additional survey over a nearshore avian "hotspot" to continue to improve species identification from aerial digital surveys
- 24 aerial surveys conducted between June 2019 and January 2021 to collect spatial and temporal distribution and abundance data on birds and other wildlife; additional surveys planned
- Surveys conducted monthly – two surveys per month during the spring (April/May) and fall (August/September) migration periods

Environmental Initiatives

Vineyard Wind 1

- **Marine Mammals and Innovation Fund:** $3 million to support development and demonstration of innovative methods and technologies to enhance marine mammal protections
- **Offshore Wind Challenge:** Partnership with Greentown Labs and MassCEC supporting advances in technology related to marine mammal monitoring, specifically for data collection and real-time transmission or data analysis for the offshore wind industry and beyond
  - February 24, 2021 - Offshore Wind Challenge Complete! Check out the Final Showcase video here: https://vimeo.com/516697230

Park City Wind

- **Offshore Wind Protected Marine Species Mitigation Fund:** Partnership with Mystic Aquarium to continue evolving the understanding of underwater noise generated by OSW and potential impacts on cetacean and pinniped behavior, hearing, and physiology
- **Connecticut's Initiative on Environmental Research of Offshore Wind:** Partnership with UConn's Department of Marine Sciences to support fisheries research, training, and education

Regional Science

- Participating in Regional Wildlife Science Entity formation to identify priority research and monitoring needs on wildlife and the offshore wind industry
- Collaborating with NEAq, MassCEC, and other developers to continue aerial marine mammal and sea turtle surveys across the WEA
- Collaborating with NMFS and NEAq to support the Marine Mammal Commission project, *Evaluating the utility of Protected Species Observer data to address cetacean management and conservation*
- Participating in State of the Science Working Groups
- Participating in Responsible Offshore Science Alliance

VINEYARD WIND

QUESTIONS?

VINEYARD WIND

Making decisions in the ocean using the best marine-life data: the offshore wind-energy tool

February 26th 2021

Marta Ribera, PhD
Spatial Ecologist. The Nature Conservancy

GORDON AND BETTY MOORE FOUNDATION

The Nature Conservancy
Protecting nature. Preserving life.

Virginia Coastal Zone
MANAGEMENT PROGRAM

CHRIS MCGUIRE
MA Marine Director

MARK ANDERSON
Director of Conservation

MARTA RIBERA
Spatial Ecologist

ERIK MARTIN
Spatial Ecologist/Tool Development

SALLY MCGEE
New England Marine Program Director

The Nature Conservancy

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CHRIS BRUCE
VA GIS Manager

Maine
- Carl Wilson. ME DMR
- Jocelyn Runnebaum. TNC ME

New Hampshire
- Chris Williams. NH DES.
- Alix LaFerriere. TNC NH.

Massachusetts
- Nils Bolgen. MassCEC
- Todd Callaghan. MA CZM.
- Kathryn Ford. MA DMF
- Chris McGuire. TNC MA.

Connecticut
- Kevin O’Brien. CT DEEP.
- DeAva Lambert. CT DEEP.
- Adelaine McCloe. CT DEEP
- Nathan Frohling. TNC CT.
- Christian Fox. TNC CT

New York
- Sherryll Huber Jones. NY DEC.
- Carl Lobue. MA NY.

New Jersey
- Kevin Hassell. NJ DEP.
- Patty Doerr. TNC NJ.

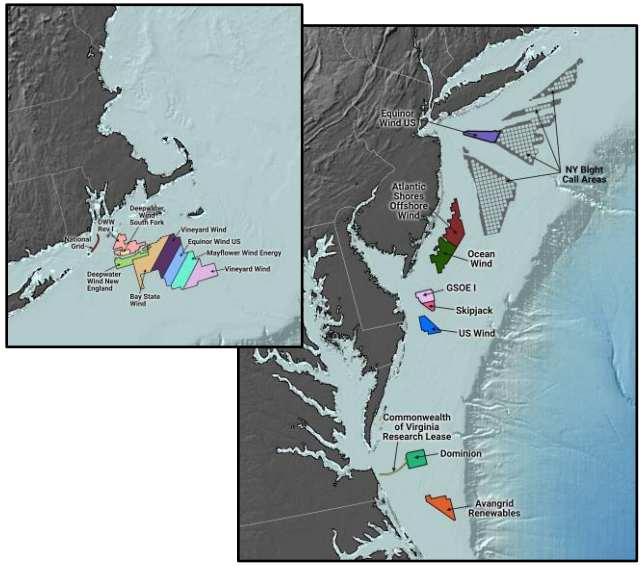
Virginia
- Laura McKay. VA CZM.
- Bettina Rayfield. VA DEQ.
- Chris Bruce. TNC VA
- Judy Dunscomb. TNC VA

North Carolina
- Daniel Govoni. NC DNR
- Brian Boutin. TNC NC

Regional
- Nick Napoli. NROC.
- Emily Shumchenia. NROC.
- Sally McGee. TNC Northeast
- Kate Wilke. TNC Mid-Atlantic

ANALYSIS AND VISUALIZATION OF MARINE-LIFE DATA IN THE CONTEXT OF OFFSHORE WIND DEVELOPMENT

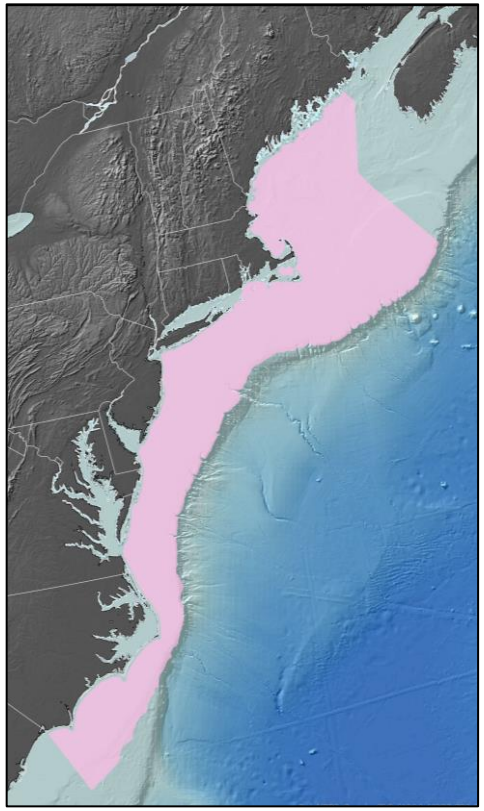
THE CHALLENGE



- Review time for EIS is short, often 30-45 days.
- We live in a data-rich region, but difficult to query all these different pieces of information
- No reference of what to look for in each region

We want to make sure that key **habitats and species** are taken into consideration when making decisions, and that decisions are made using **best science and data** available

OUR PROJECT



Leverage marine-life and habitat data available to provide guidance related to wind energy development.

- Review and update datasets
- Data analysis and interpretation
- Decision Support Tool

All guided by **Steering committee** of experts and potential users

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GORDON AND BETTY MOORE FOUNDATION

Virginia Coastal Zone Management Program

FROM INFORMATION TO DECISION-MAKING

SPATIAL INFORMATION

BEST INFORMATION AVAILABLE FOR THE REGION

Regional data portals

- Provide best regional ocean data layers available
- Portal teams and expert panels determine data gaps, review all information available and curate best regional information

SYNTHESIZE AND INTERPRET INFORMATION

Provide **context:**

- **Over an ecoregion**
- **Over time**
- **Applied to an activity**

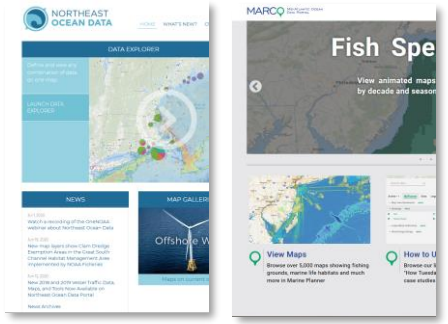
REVIEW INFORMATION AND PLANNING

Impact Assessments, Reviews

MAKE DECISIONS BASED ON BEST AVAILABLE DATA

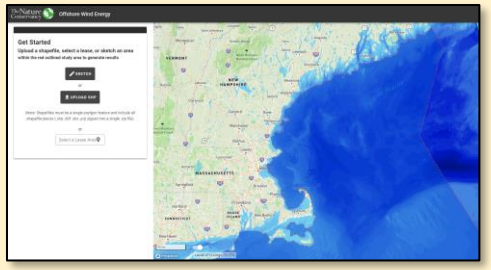
SO MANY TOOLS … COMPARISON

REGIONAL DATA PORTALS



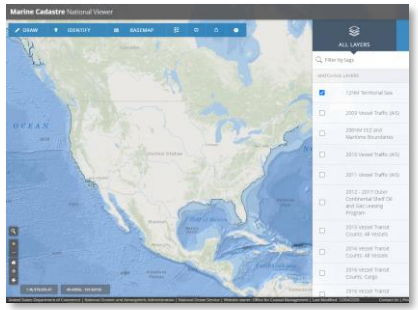
- Provide **best regional ocean data** layers available
- Explore layers **individually**, by theme and connect to other resources
- Compare layers **visually** by changing transparency

THIS PROJECT



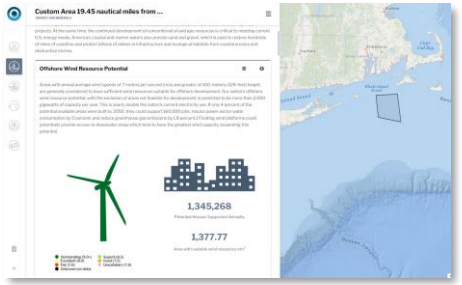
- **Query** a location and view information
- Rely on **regional data** portal's information
- Provide **interpretation and context** based on ecoregion, over time, and connected to activity
- **Focused on marine life and habitat data**
- Explore layers **quantitatively** to understand features

MARINE CADASTRE



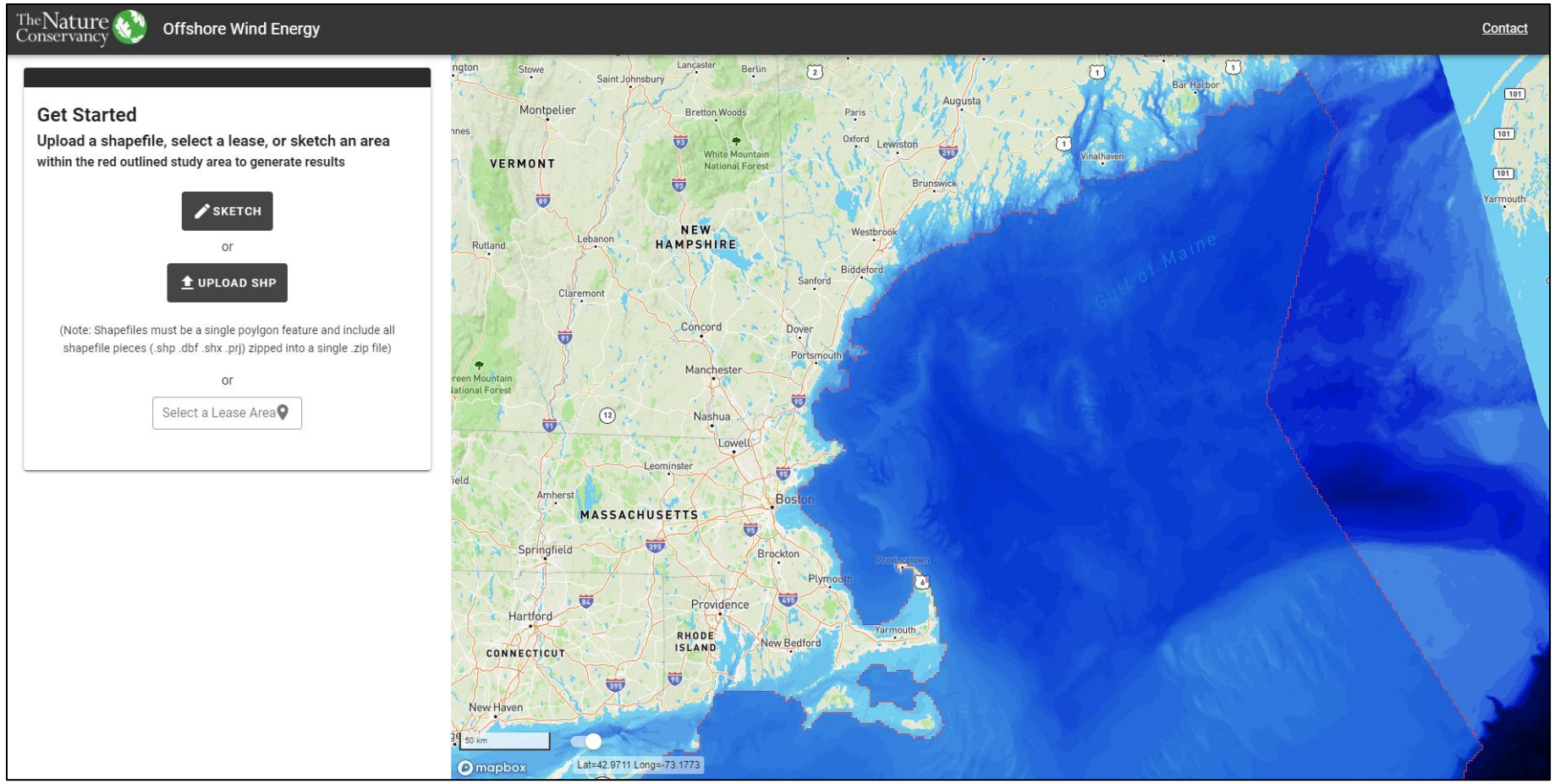
- Provide **best national ocean data** layers available
- Explore layers **individually** and connect to other resources
- Compare layers **visually** by changing transparency

OCEAN REPORTS



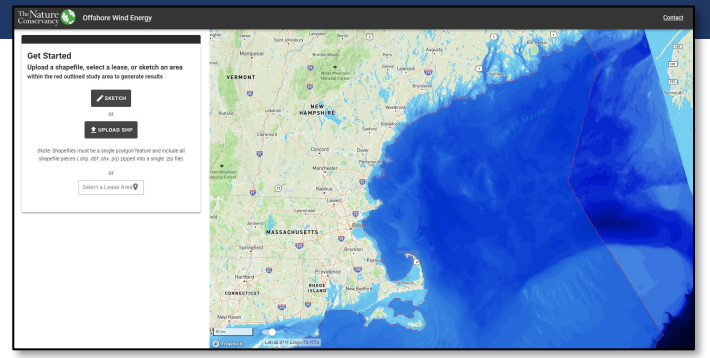
- **Query** a location and view information
- Rely on Marine Cadastre information (**national data**)
- View infographics on different topics (oceanography, demographics, etc.). **Limited interpretation and context** provided.
- Availability **of marine life data** is limited
- Explore layers **quantitatively** as part of visualizations

THE TOOL



https://maps.tnc.org/offshorewind/testing/ ⟶ https://maps.tnc.org/offshorewind/

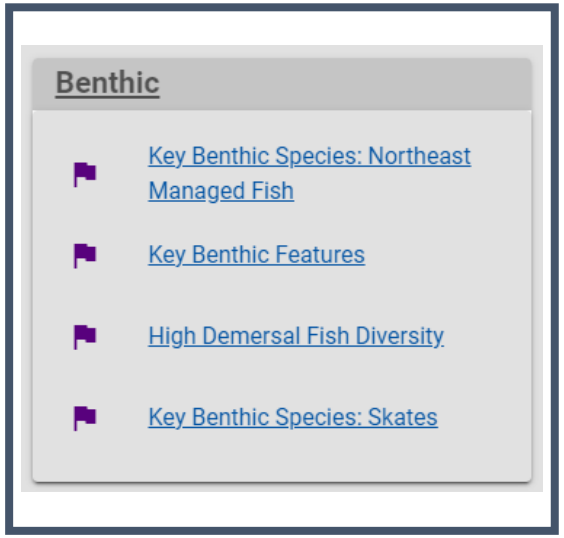
UNPACKING ALL THE INFORMATION USING A DECISION SUPPORT TOOL



Select area by:

- Drawing
- Importing a shapefile
- Selecting a pre-set lease area

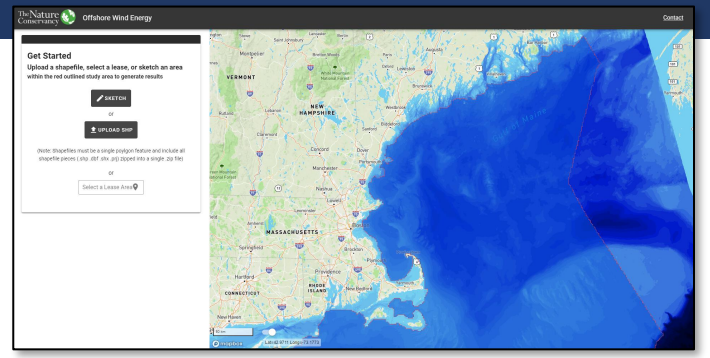
OVERALL “FLAGS”



3 types of flags:

- Presence/absence of a feature (e.g. hardbottom)
- High diversity compared to ecoregion
- Core biomass/abundance areas for key species

UNPACKING ALL THE INFORMATION USING A DECISION SUPPORT TOOL



OVERALL "FLAGS"

Benthic

- Key Benthic Species: Northeast Managed Fish
- Key Benthic Features
- High Demersal Fish Diversity
- Key Benthic Species: Skates

ECOLOGICAL GROUPINGS

DEMERSAL

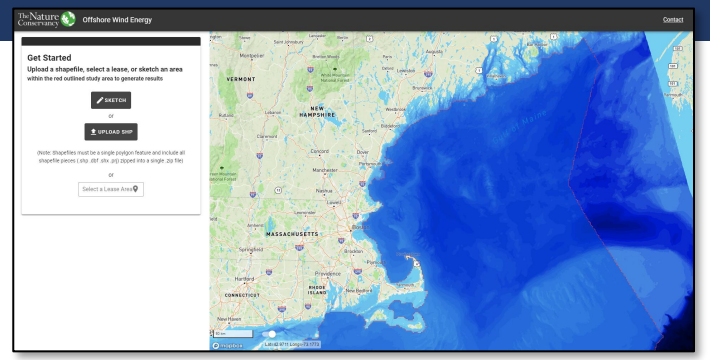
26 species supported by site

61% species with persistent high biomass

Importance:
Above Average

Gulf of Maine Average =
7 species with >70% persistence per 1k²

UNPACKING ALL THE INFORMATION USING A DECISION SUPPORT TOOL



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ECOLOGICAL GROUPINGS

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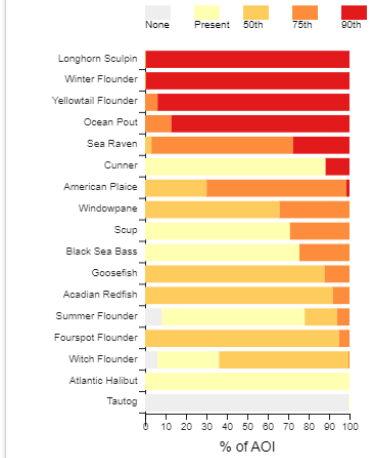
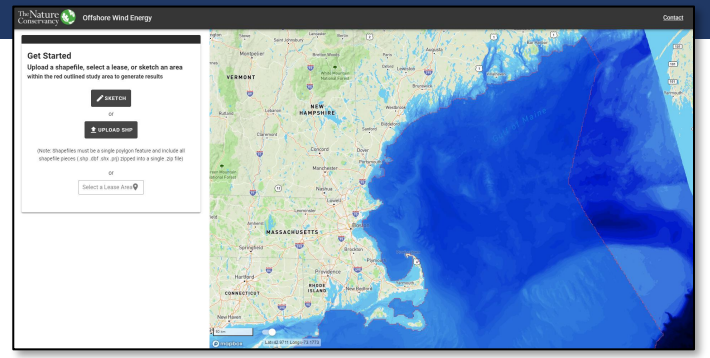
SPECIES DATA



UNPACKING ALL THE INFORMATION USING A DECISION SUPPORT TOOL



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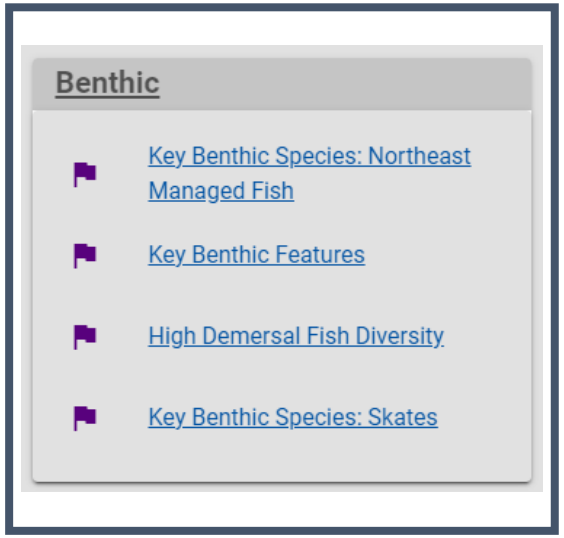
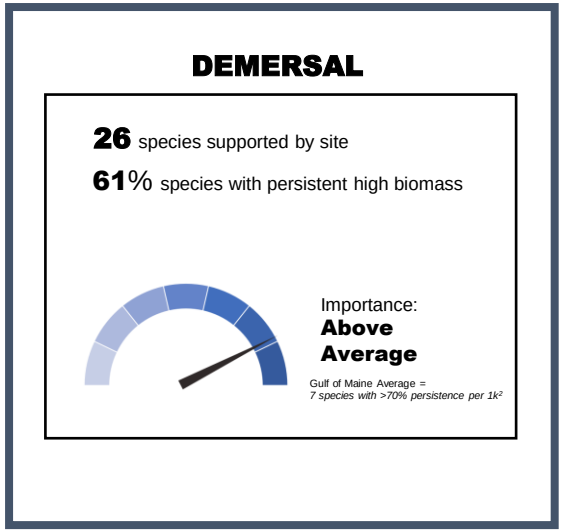
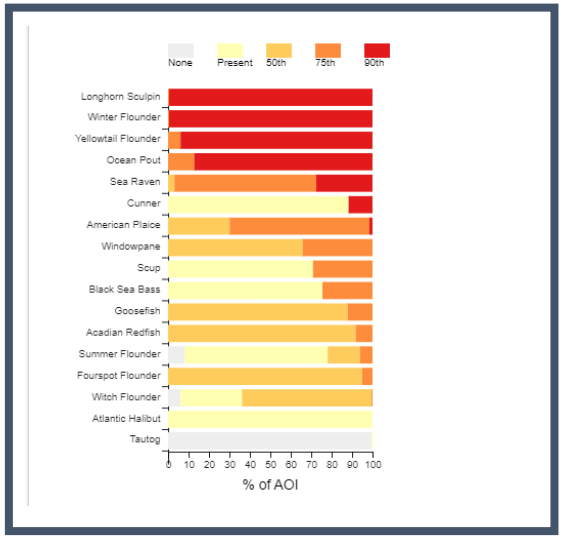


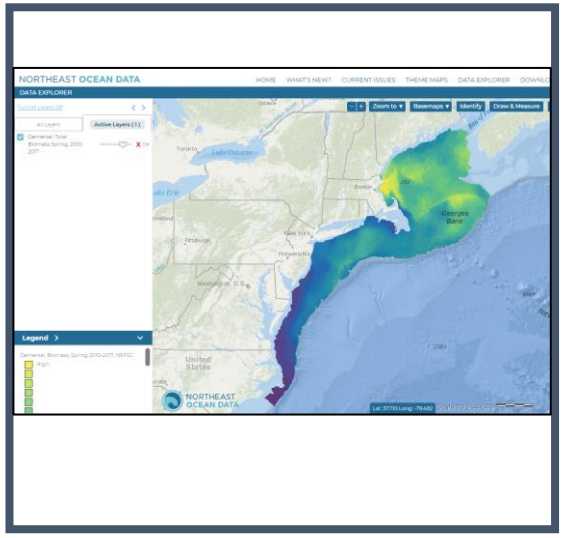
ECOLOGICAL GROUPINGS



SPECIES DATA



DATA PORTALS

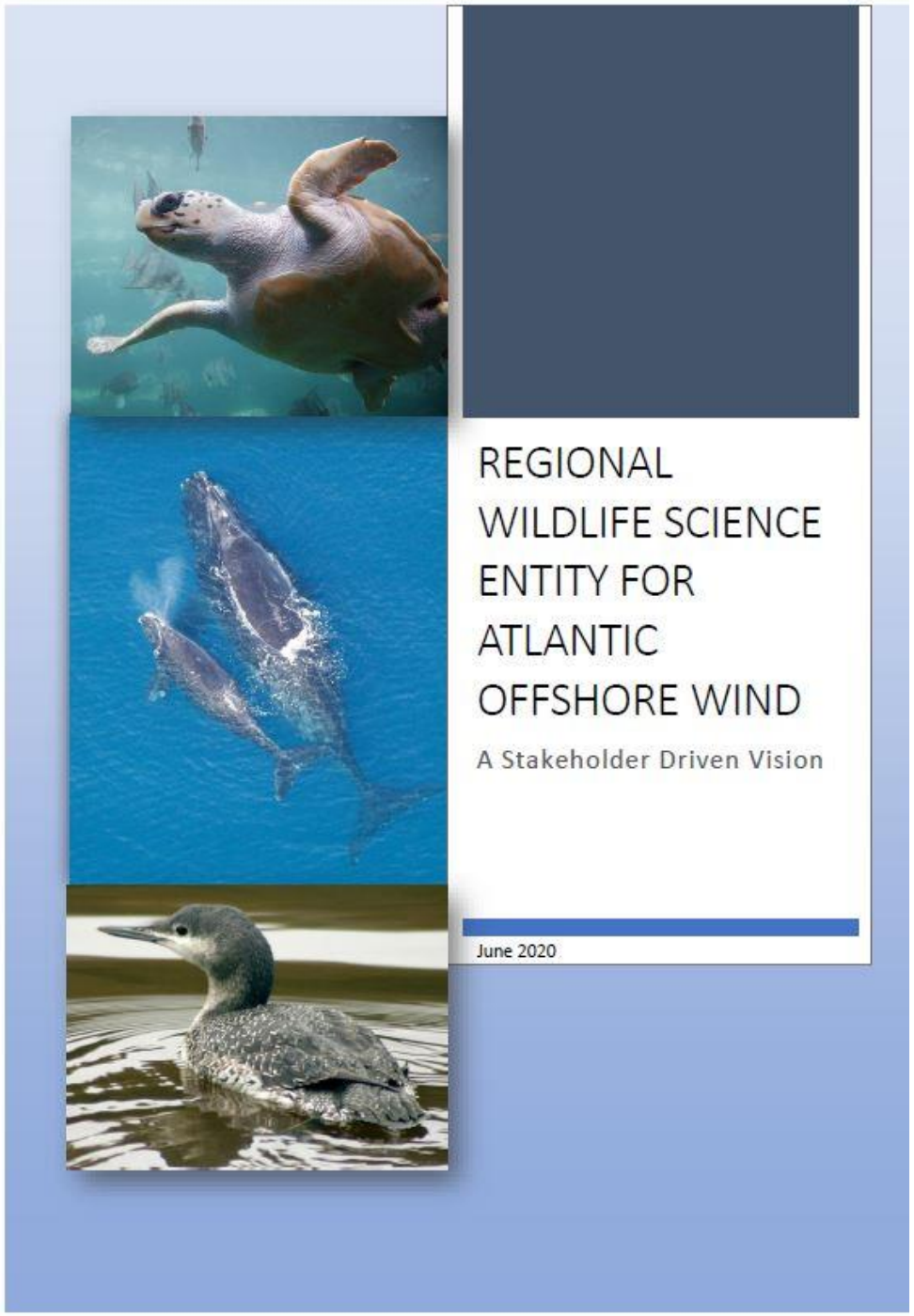


Links to both portals in each layer

Regional Wildlife Science Entity for Atlantic Offshore Wind Development

A Stakeholder Driven Effort

Massachusetts Habitat Working Group
February 26, 2021
Nils Bolgen, MassCEC



RWSE Vision Recap

- **Mission:** To collaboratively and effectively conduct and coordinate relevant, credible, and efficient regional monitoring and research of wildlife and marine ecosystems that supports the advancement of environmentally responsible and cost-efficient offshore wind power development activities in U.S. Atlantic waters.

(https://www.nyetwg.com/regional-wildlife-science-entity)

CADMUS

CBI
CATALYZING COLLABORATION

Supported by:
The Nature Conservancy
Defenders of Wildlife
Conservation Law Foundation
Ocean Conservancy
Mass Audubon
Atlantic Shores
Orsted
Vineyard Wind
Avangrid
RWE

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518-862-1090 x 3110

Nils Bolgen
NBolgen@MassCEC.com
617-315-9311

Current Status of the RWSE

Request for Qualifications (RFQL) for the RWSE fiscal agent officially launched here and will be open until March 11.

- **Seeking**
  - A fiscal agent to financially manage multi-sectoral, regional collaboration and science around offshore wind and wildlife for the East Coast of the United States
  - A Director to coordinate the activities of the RWSE, including supporting the Interim Steering Committee
- **Issued by** NYSERDA, in collaboration with the Massachusetts Clean Energy Center (MassCEC), in coordination with the members of the Interim Steering Committee
- **Selection expected** by April 2021
- **Funding:** $30K per year for two years by CT, MA, MD and NY + financial support committed by OSW developers

DOE FOA 2237

- **Topic Area 1: Environmental Research, Validation of Tools and Methods, and Multi-year Evaluation of Impacts of Offshore Wind Energy Development on Wildlife in U.S. Atlantic Waters**
  - Up to $7.5 million available
  - DOE anticipates making one award
  - Project length up to five years
  - Ongoing coordination with DOE, BOEM, NOAA NMFS and USFWS
- Schedule

Concept Papers	March 1, 2021
DOE invitation to submit full application	~mid-April?
Full Applications	May 5, 2021
DOE selection	~July 2021

DOE FOA 2237

Research Focus Areas

- Assess or mitigate impacts of construction noise on marine species
- Assess changes in habitat or marine species' use of habitat
- Assess collision risk for birds and/or bats

Objectives

- Design methodologies and frameworks
- Carry out a research program
- Evaluate methodologies and technologies
- Use data collected to update/inform existing datasets and tools
- Publish and disseminate results

MassCEC Response to DOE FOA 2237

- In coordination with non-federal members of the RWSE ISC
- Submitted in partnership with or on behalf of a to-be-identified RWSE fiscal agent

- **Objectives:**
  1. To lay groundwork for the Selected RWSE to be able to partner with any and all of multiple teams submitting applications to DOE (likely university consortiums and NREL and/or PNNL)

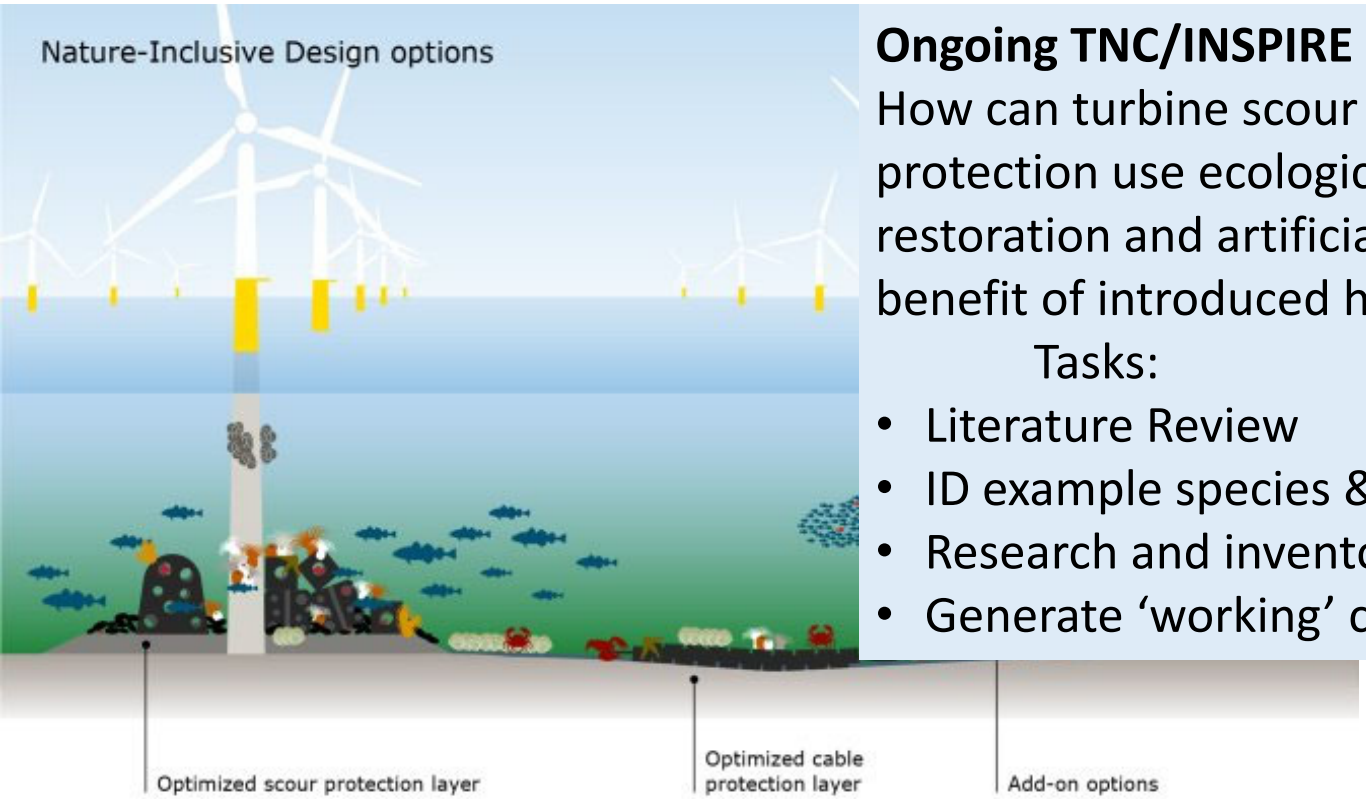
  2. To use the concept paper to fully apprise DOE of the anticipated RWSE roles, selection process, and approach for incorporating a Selected RWSE onto most if not all Full Applications to DOE.

  3. To be in position to develop and submit a full application to DOE if necessary, e.g. if RFQL process does not result in selection of an RWSE fiscal agent.

RWSE Value Add to FOA Respondents

- Mechanism for multi-sectoral stakeholder support and participation
- Process has broad regional buy-in
- Can ensure that tasks incorporate the input of, and buy-in from federal/state agencies, OSW developers, NGOs, and other stakeholders
- Integrates the FOA-funded work into broader regional efforts
- Can Contribute meaningfully to match
    1. Existing funding for 2 years
    2. Volunteer/in-kind time from the Steering Committee, Sector Caucuses, Subcommittees

End



Ongoing TNC/INSPIRE Environmental project

How can turbine scour protection and/or cable protection use ecological principles of coastal habitat restoration and artificial reef methods to maximize the benefit of introduced hard structure for key species

Tasks:

- Literature Review
- ID example species & associated habitat requirements
- Research and inventory design options and risks
- Generate ‘working’ catalogue

Hermans et al. (2020). Nature-Inclusive Design: a catalogue for offshore wind infrastructure (https://edepot.wur.nl/518699) | Design: Wageningen University & Research 2020