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Empire Wind I and II and Beacon Wind Mitigation Plan Updates
E-TWG
November 29, 2022

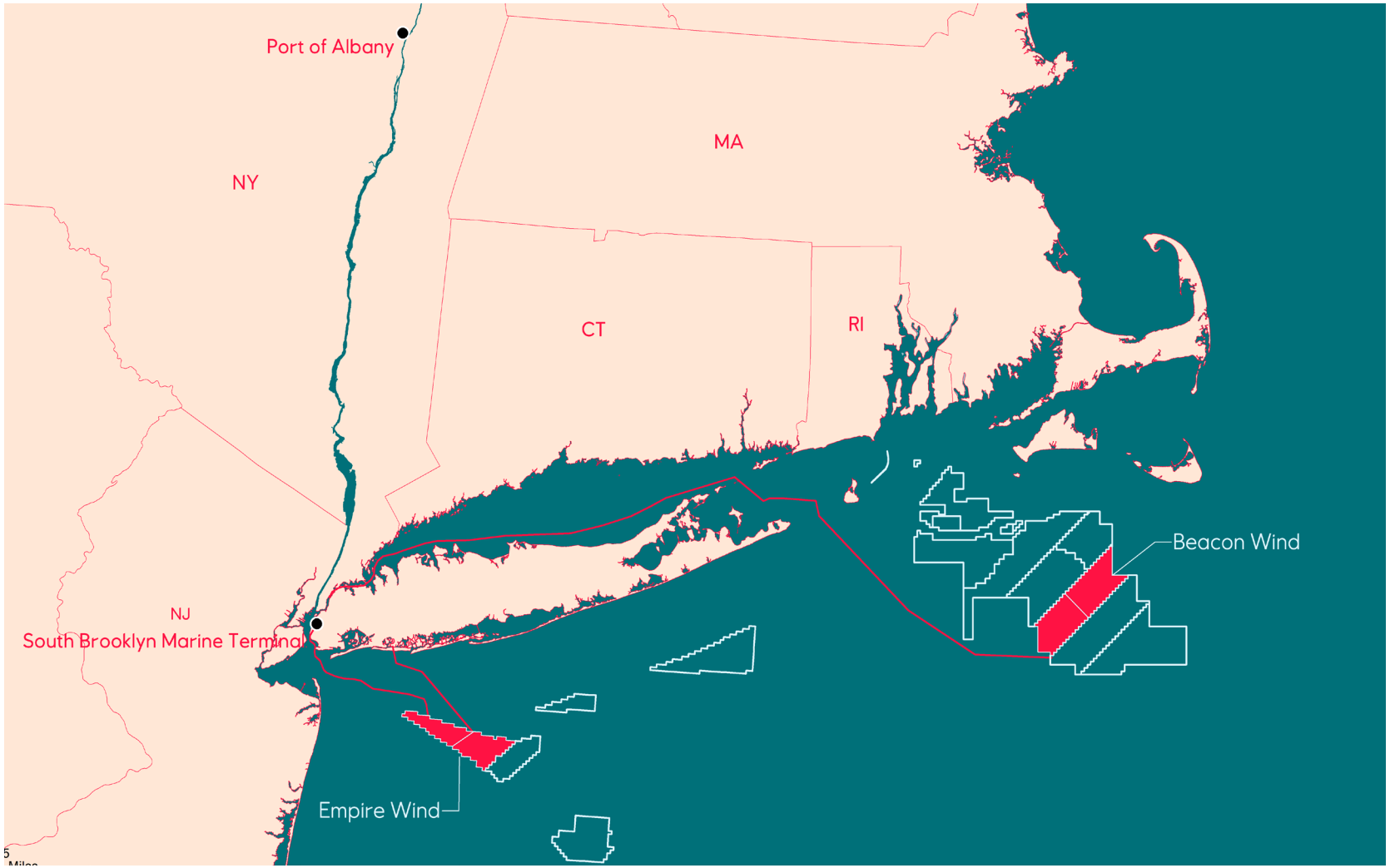
Agenda and Equinor Team Members

Topic	Time	Presenter
Introductory Remarks	5 min	Scott Lundin
Empire Wind II & Beacon Wind IPSA Monitoring Plan	15 min	Michelle Fogarty
Empire Wind DEIS	20 min	Eva Land & Chris Daykin
Marine Mammal Mitigation Plan & Expert Panel Update	20 min	Jordan Carduner
Avian & Bat Monitoring Plan	20 min	Darrell Oakley
Benthic & Fisheries Monitoring Plan	20 min	EJ Marohn
Next Steps & Adjourn	5 min	NYSERDA

Other team members in the meeting:

Josh Verleun – Empire Wind Permitting Director
Julia Lewis – Beacon Wind Permitting Director
Sue Davis – Onshore/State Permitting Manager
Elizabeth Marchetti – Fishery Liaison Officer

Equinor is Helping **Offshore Wind Grow in New York**



50-50 Joint Venture with bp

Empire Wind 1 &2, and Beacon Wind 1, will supply 3.3 GW of clean energy to New York = 2 million homes

$47 million in workforce development, innovation and community benefits across New York State

$25 million to support regional monitoring of wildlife and key commercial fish stocks

EW2 and BW1 PSA Monitoring Plan Update
Michelle Fogarty

Monitoring Plan Background

EW2 (1,260 MW) and BW1 (1,230 MW) Offshore Wind Renewable Energy Certificate Purchase and Sale Agreements with NYSERDA signed January 14, 2022

- Section 12.10: Support for Monitoring of Key Commercial Fish Stocks and Wildlife of Conservation Concern
  - Provide for NYSERDA's consent a Monitoring Plan by January 14, 2023
  - $5,000/MW of offer capacity allocated to support regional monitoring of key regional commercial fish stocks to better understand how offshore wind energy development is potentially altering the biomass and/or distribution of these stocks
  - $5,000/MW of offer capacity allocated to support reginal monitoring of wildlife of conservation concern to better understand how offshore wind energy development affects distribution and abundance of sensitive species.
  - Funding shall be directed to advance the responsible development of the offshore wind energy industry, and not limited exclusively to the Selected Project.
  - Monitoring Plan shall require 50% of funding committed by January 14, 2024, remaining 50% of funding committed by January 14, 2025
  - Financial support may be provided by any combination of (i) donation by EW2 and BW1 to a not-for-profit organization with the capacity for undertaking the monitoring work, and (ii) direct expenditure by EW2 and BW1 to finance the monitoring work.

Monitoring Plan Update

EW2 and BW1 propose to allocate funds to ROSA (commercial fish stocks) and RWSC (wildlife of conservation concern)

- ROSA and RWSC can leverage subject matter experts and are aligned with NYSERDA's commitment to a regional approach to research gap identification and research prioritization
- With input and guidance from Equinor and NYSERDA to Develop RFPs, Select Awardees, Administer Funds, Manage Projects, Collect and Share Data, Communicate Project Progress

Timeline	Action
Q4 2022	Equinor, ROSA, RWSC finalize Monitoring Plan and submit to NYSERDA
By January 14, 2023	Submittal of Monitoring Plan to NYSERDA for approval
Q1/Q2 2023	Equinor contracting with ROSA and RWSC
2023	Develop RFPs and selection process
2023/2024	Issue RFPs
2024-2028	ROSA and RWSC Administer Funds, Manage Projects, Collect and Share Data, Communicate Project Progress

Draft Environmental Impact Statement
Eva Land and Chris Daykin

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Empire Offshore Wind Draft Environmental Impact Statement Volume 1

November 2022

Draft Environmental Impact Statement

How to Attend and Comment

Your participation is encouraged, and comments are welcomed.

Oral comments
Register to attend, and/or comment at https://www.boem.gov/renewable-energy/state-activities/empire-wind

Online
Post comments at http://www.regulations.gov. Search for Docket No. BOEM-2022-0053, select "Comment" below the document link, enter your comment and then select "Submit."

Postal Mail
Send written comments to Empire Wind COP DEIS, Program Chief, Office of Renewable Energy Programs, Bureau of Ocean Energy Management, 45600 Woodland Road, Sterling, VA 20166

- Comment Period November 18, 2022, through January 17, 2023
- DEIS virtual public meetings hearing/meeting information and registration may be found at: https://www.boem.gov/renewable-energy/state-activities/empire-wind
- Public Meeting Dates and Start Times:
  - Wednesday December 7, 2022 at 5:00 PM
  - Tuesday December 13, 2022 at 5:00 PM
  - Thursday December 15, 2022 at 1:00 PM

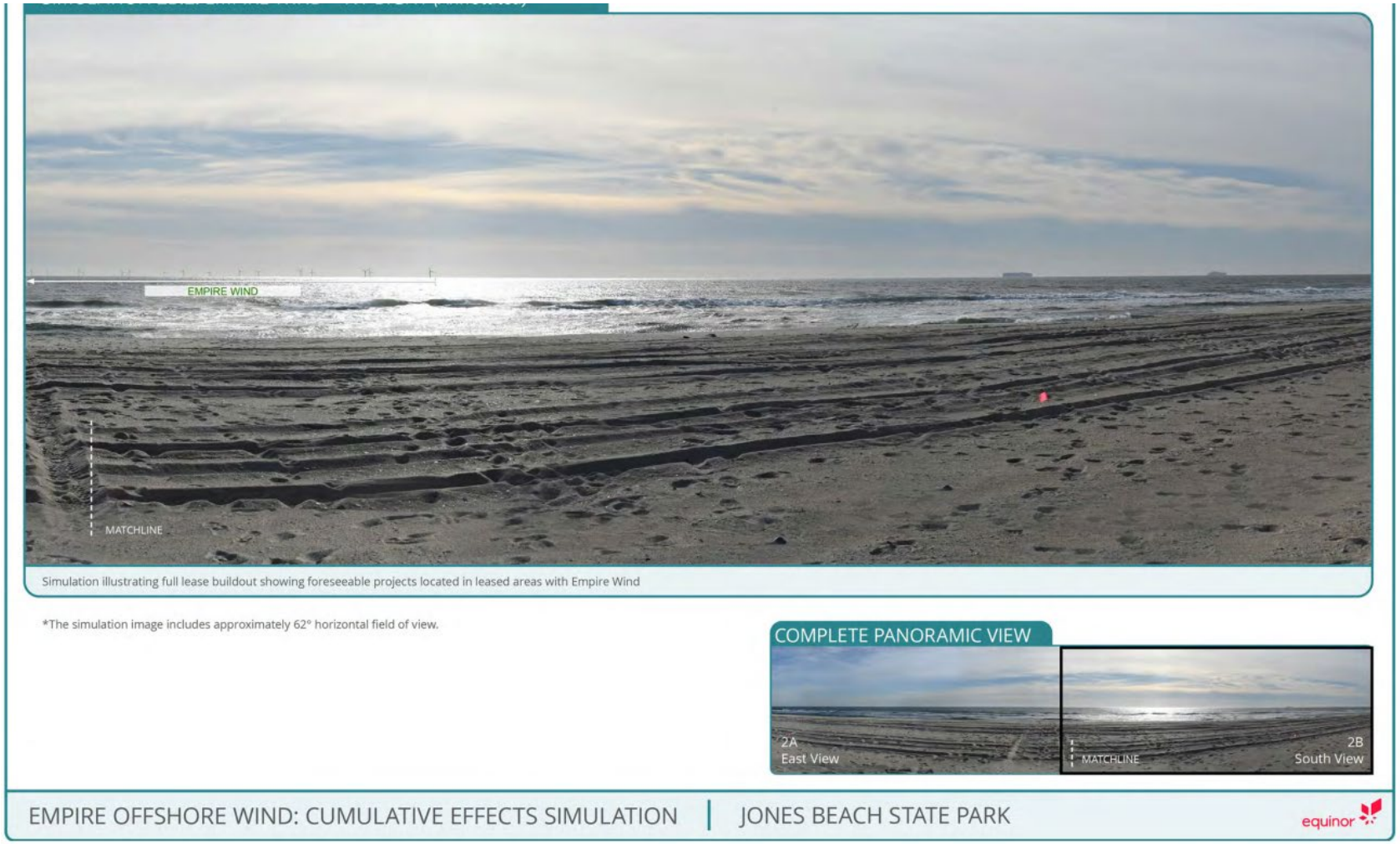
Alternatives

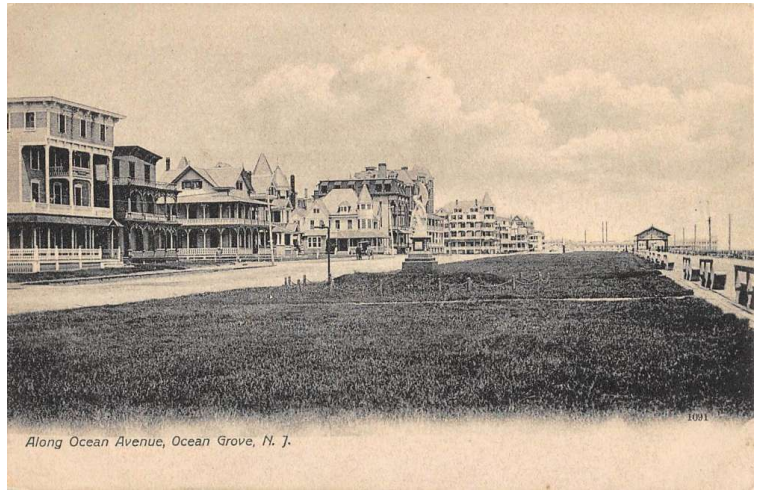
- No Action Alternative
- Alternative A—Proposed Action
- Alternative B—Remove Up to Six Wind Turbine Generator (WTG) Positions from the Northwest End of EW 1
- Alternative C—EW 1 Submarine Export Cable Route
  - Alternative C-1—Gravesend Anchorage Area
  - Alternative C-2—Ambrose Navigation Channel
- Alternative D—EW 2 Submarine Export Cable Route Options to Minimize Impacts on the Sand Borrow Area
- Alternative E—Setback between EW 1 and EW 2
- Alternative F—Wind Resource Optimization with Modifications for Environmental and Technical Considerations
- Alternative G—Cable Bridge Crossing of Barnums Channel Adjacent to Long Island Railroad Bridge
- Alternative H—Dredging for EW 1 Export Cable Landfall

- "BOEM may 'mix and match' multiple listed Draft EIS alternatives to result in a preferred alternative that will be identified in the Final EIS provided that:
  - (1) the design parameters are compatible; and
  - (2) and the preferred alternative still meets the purpose and need."

- Impacts of alternatives are classified as either negligible, minor, moderate, or major.

“Moderate” Impacted Resource Areas





South Brooklyn Marine Terminal - Appendix P

Marine Mammal Mitigation Measures
Jordan Carduner

Empire Wind Letter of Authorization (LOA)

Empire Wind LOA – activities analyzed

- All activities that may occur between 2024-2028 analyzed based on potential for take of marine mammals
- All anticipated take from underwater acoustic impacts:
  - Foundation installation (impact pile driving)
  - Landfall activities (vibratory driving for cofferdam installation)
  - Geophysical surveys

Empire Wind Letter of Authorization (LOA)

Empire Wind LOA – mitigation and monitoring

- Mitigation and monitoring measures proposed for all activities with potential to result in take:
  - WTG foundation installation
  - Cofferdam installation / vibratory pile driving
  - Geophysical surveys
  - Vessel strike avoidance

Empire Wind Letter of Authorization (LOA)

Empire Wind LOA – mitigation and monitoring

- Mitigation and monitoring proposed for WTG foundation installation:
  - Seasonal restriction (January-April) to minimize impacts to right whales
  - Time of day restrictions (no nighttime pile driving)
  - Passive acoustic monitoring (PAM)
  - Protected species observers (PSOs)
  - Noise attenuation during pile driving
  - Soft start of pile driving at lower energy
  - Pre-clearance and shutdown zones – ensure no marine mammals present before/during pile driving

Empire Wind Letter of Authorization (LOA)

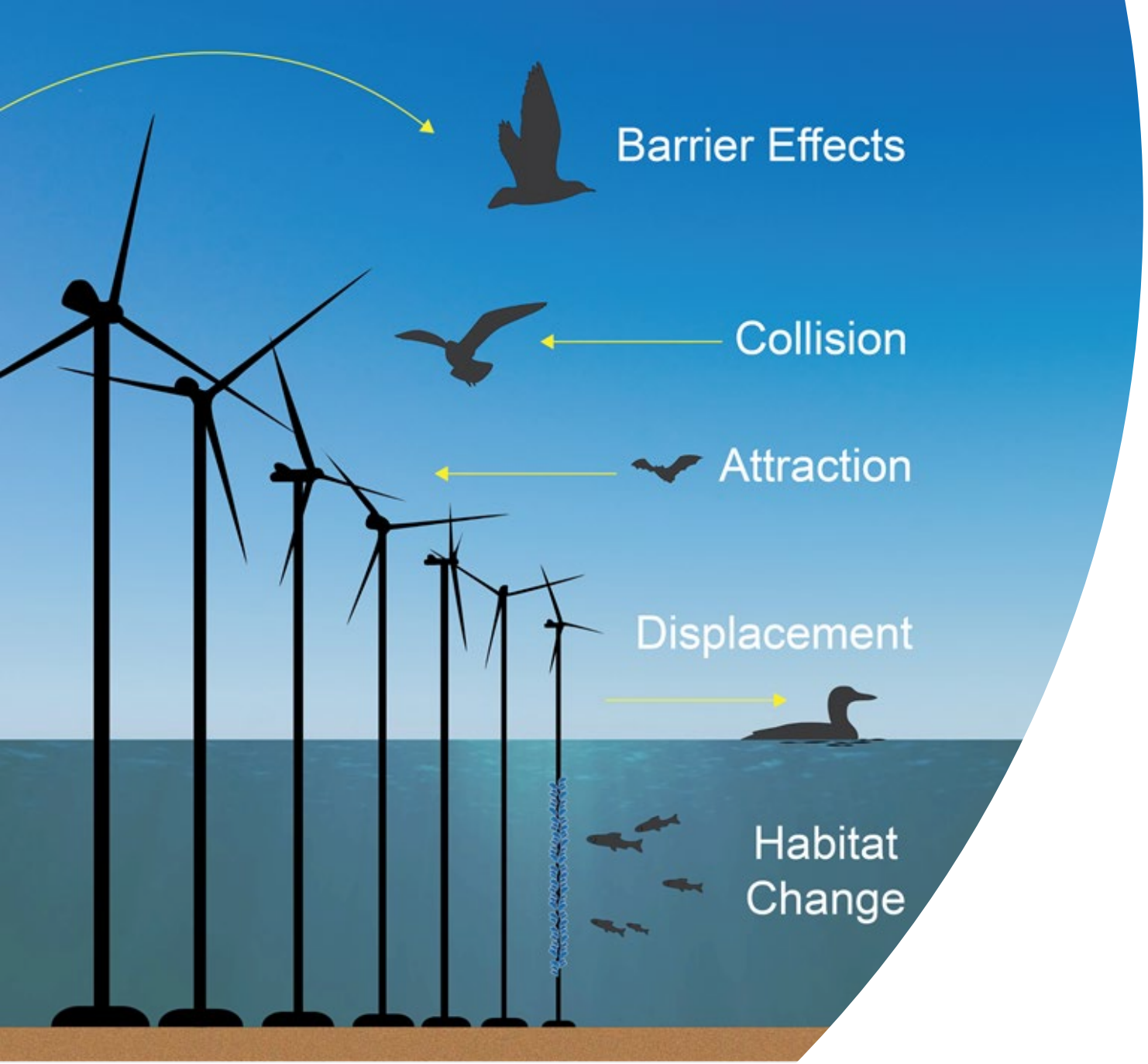
Empire Wind LOA – next steps

- LOA application available on NMFS web site for review
- Public comment period on Notice of Receipt of application closed Oct 11
- Notice of Proposed Authorization April 2023 – followed by public comment period
- Final rulemaking December 2023
- LOA issued January 2024

Empire Wind – Panel of Experts

- Panel of experts convened by Equinor in Feb 2022 to analyze and recommend marine mammal detection technologies
- Goal: minimize sound impacts from pile driving activities in support of environmentally-responsible construction of Empire Wind
- Experts include acousticians, biologists and modelers from academia, research institutions and NGOs
- Expert panel is providing:
  - Technical evaluation, guidance and recommendations on monitoring/mitigation technologies
  - Insights on feasibility, readiness, limitations and effectiveness of emerging and potential marine mammal detection technologies
- Panel analysis expected Q1 2023
- Equinor will review expert panel analysis and evaluate implementation upon receipt

Avian/Bat Monitoring Framework
Darrell Oakley



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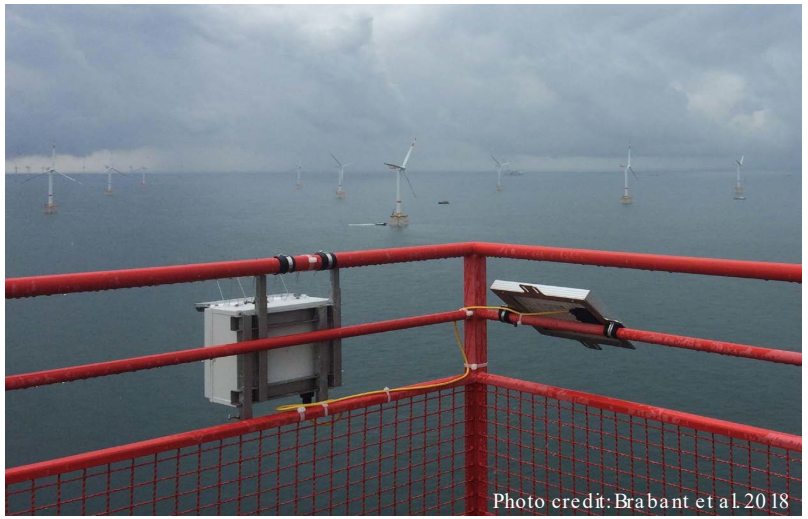
Avian and Bat Post-Construction Monitoring Framework

GOAL – support the understanding of bird and bat interactions for the EW1 and EW2 projects

Avian and Bat Post - Construction Monitoring

Acoustics

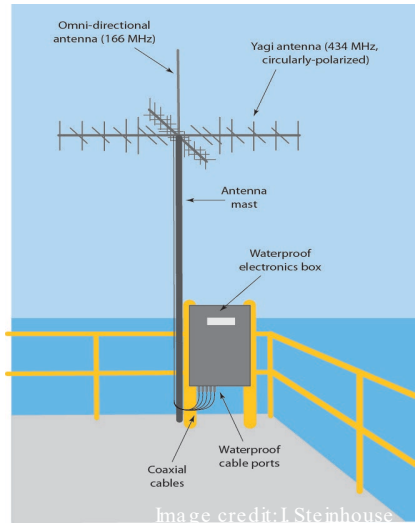


Bats/Nocturnal Migratory Birds

Acoustic detectors

Up to 6 WTGs (bats),
2 substations (birds)

Tracking

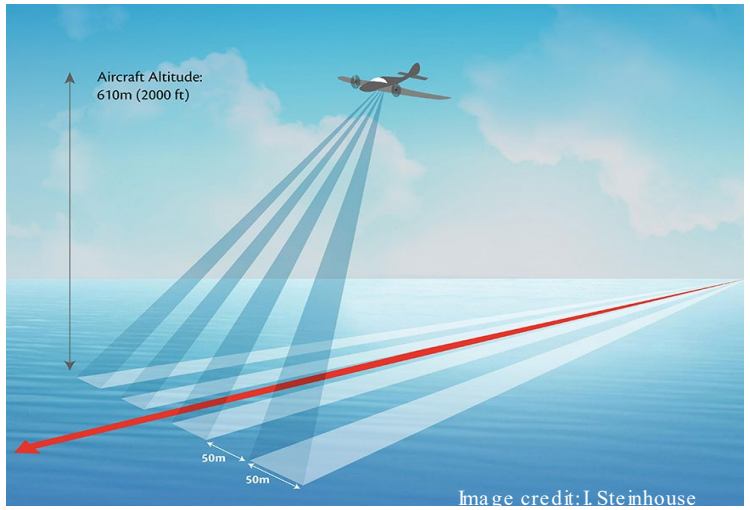


ESA-listed birds/other tagged birds, and bats

Motus receivers and tags

2 to 4 coastal stations,
300 tags/year

Visual

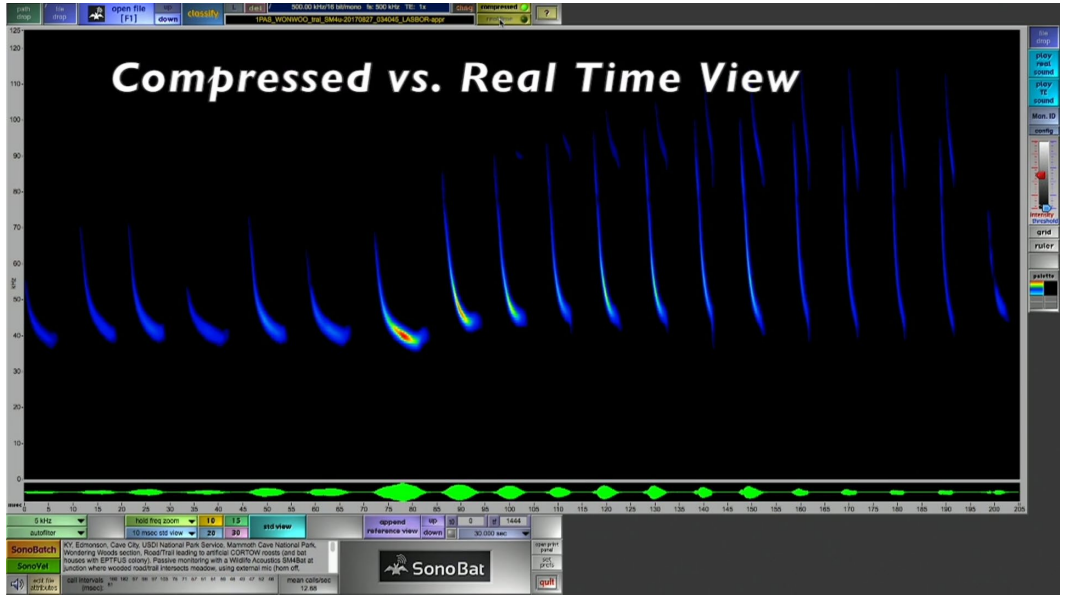


Birds/Bats

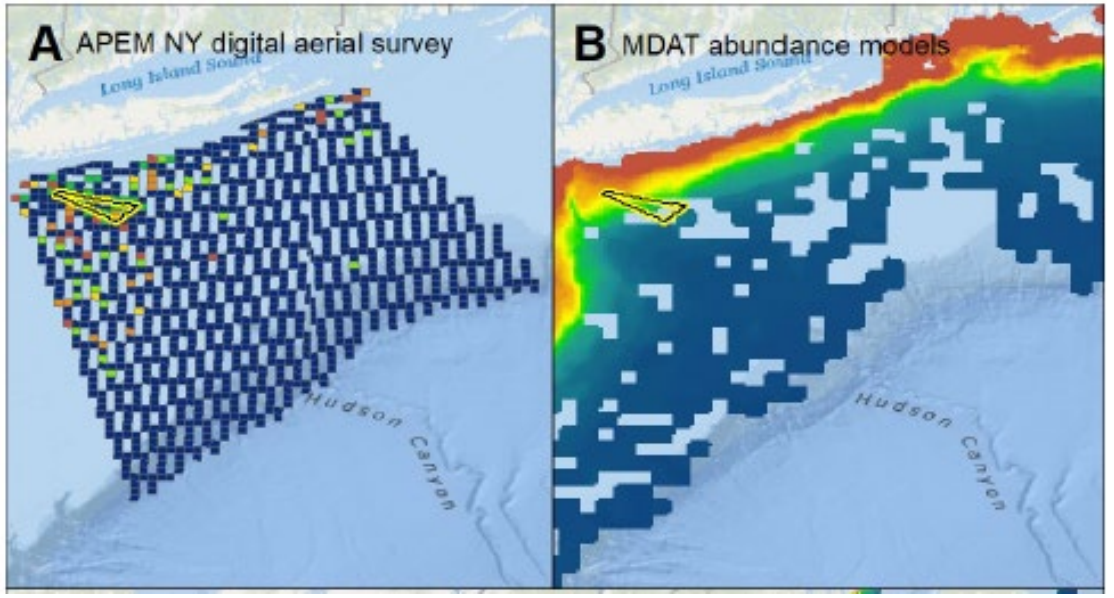
Digital aerial surveys and incidental observations

10% coverage with 4 km buffer (aerial surveys)

Avian and Bat Post-Construction Monitoring



Full Spectrum Bat Acoustics Analysis



Pre-construction Common Loon Abundance for Post-Construction Analysis

Fish and Benthic Monitoring Framework

EJ Marohn

Fisheries and Benthic Monitoring Framework - Empire Wind

Survey	Gear/Equipment	Survey Design	Objectives	Timing
Bottom trawl targeting Longfin squid	Bottom Otter Trawl with TED	Before-After, Control-Impact (BACI)	Monitor for changes in CPUE of longfin squid and bycatch species between the impact and reference area before, during, and after construction	**Summer (July-August); Annual**
Baited Remote Underwater Video (BRUV)	Benthic BRUV with twin cameras	Before-After Gradient (BAG)	Monitor for changes in species abundance and diversity along a distance gradient from turbine foundations before, during, and after construction	Seasonally (Winter, Spring, Summer, Fall); **Annual**
eDNA	Water samples	Paired with trawl and BRUV surveys	Monitor for changes in fish community composition, including those species not encountered in the trawl and BRUV surveys, before, during, and after construction	**Summer**; Seasonally; Annual
Acoustic Telemetry	Vemco VR2AR receivers and transmitters	Even distribution of receivers within lease area to maximize detection range	Monitor for changes in the presence, persistence, and movements of key species within the lease area before, during, and after construction	Year-Round
Atlantic Sea Scallop Imagery	Plan View Imaging	Before-After, Control-Impact (BACI)	Monitor for changes in average abundance and spatial distribution of sea scallops between impact and reference area before, during, and after construction	Late Summer/Early Fall; Annual
Epifaunal Growth on Novel Hard Bottom Structures	ROV video imagery, photogrammetry	Stratified random selection of structures (WTG foundations, protected cable segments), stratified by water depth	Monitor changes in epifaunal biomass, community composition, with depth and time since construction	Late Summer/Early Fall (Y0, Y1, Y2, Y3, Y5)
Benthic function on seafloor surrounding WTG foundations	SPI/PV	Before-After Gradient (BAG) (same turbines as above)	Monitor changes in benthic function (aRPD depth, organic matter content, infaunal successional stage) with distance from foundation and time since construction	Late Summer/Early Fall (Y0, Y1, Y2, Y3, Y5)

Example of a Proposed Reference and Impact Areas -Empire Wind

Similar Habitat and Depth

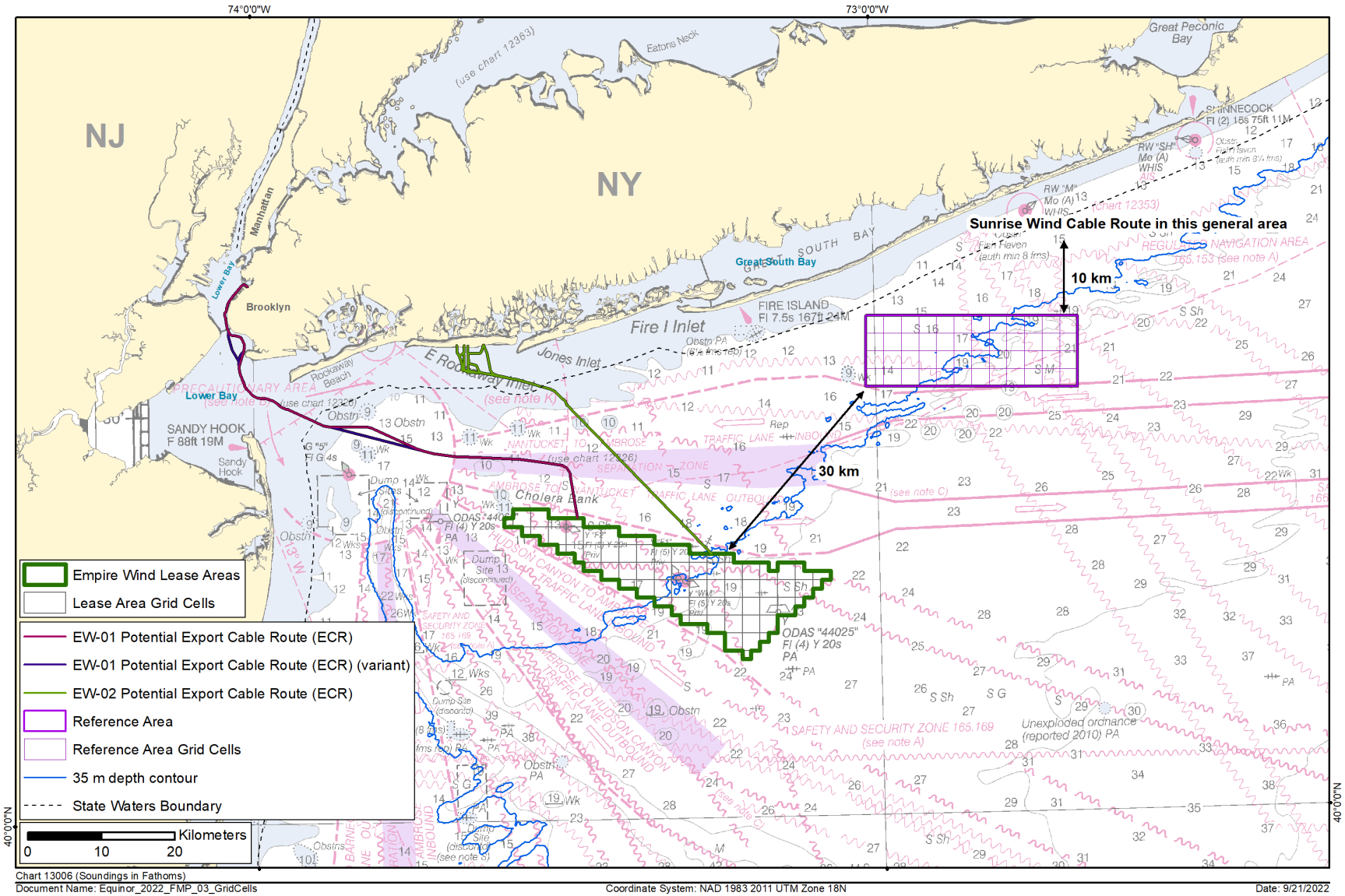
Sufficient distance away from:

- OSW Construction area (30 nm)
- Vessel Traffic Schemes

Historic fishing trends

Two depth strata in each sample area (<35 and >35)

Adjusted Sampling Period Based on Feedback



Example: Proposed – Telemetry Arrays Empire Wind

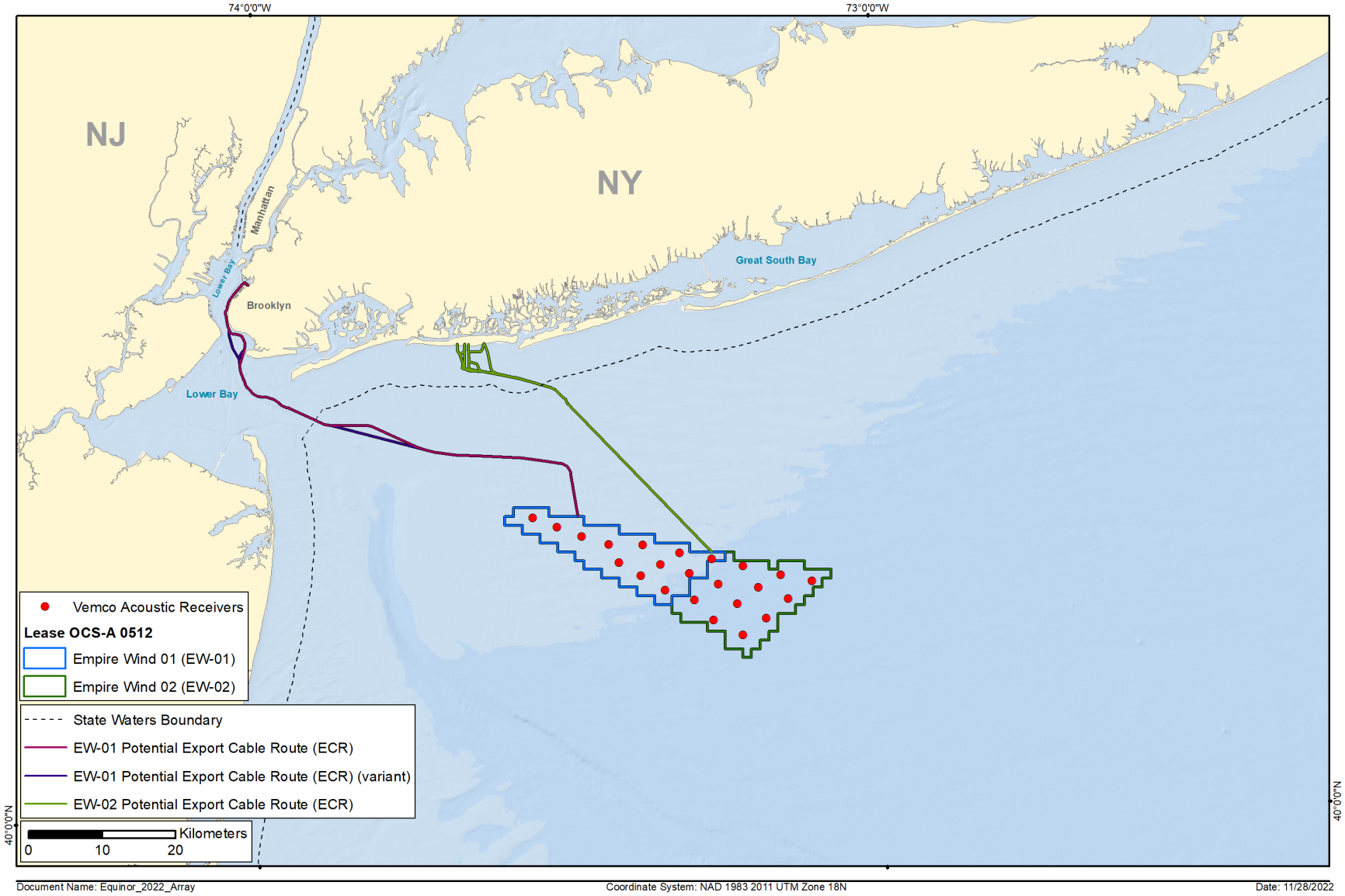
23 Arrays

Even Distribution to Maximize Coverage within the Lease Area

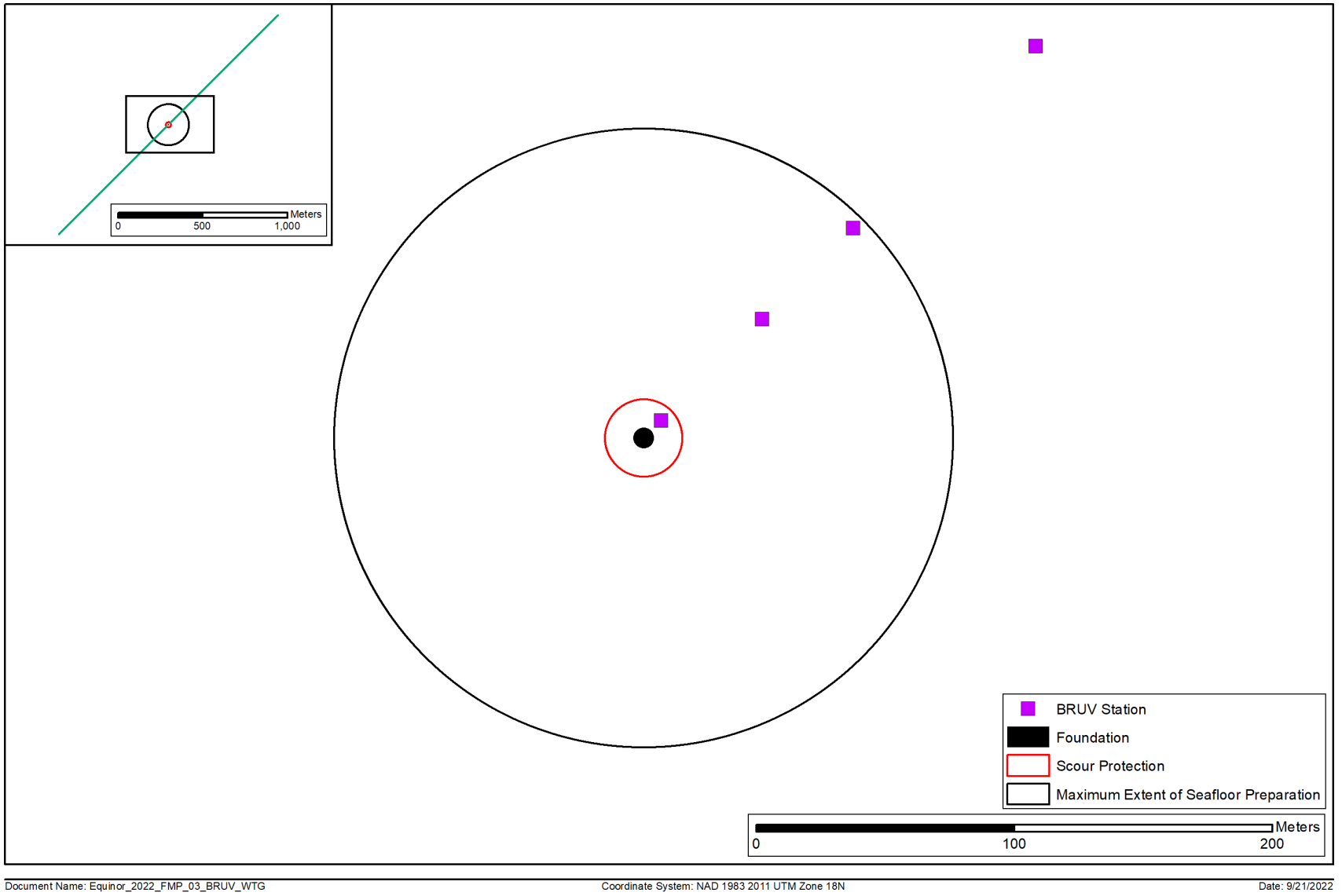
Building on Success of HMS project in Beacon Wind

Sturgeon focus

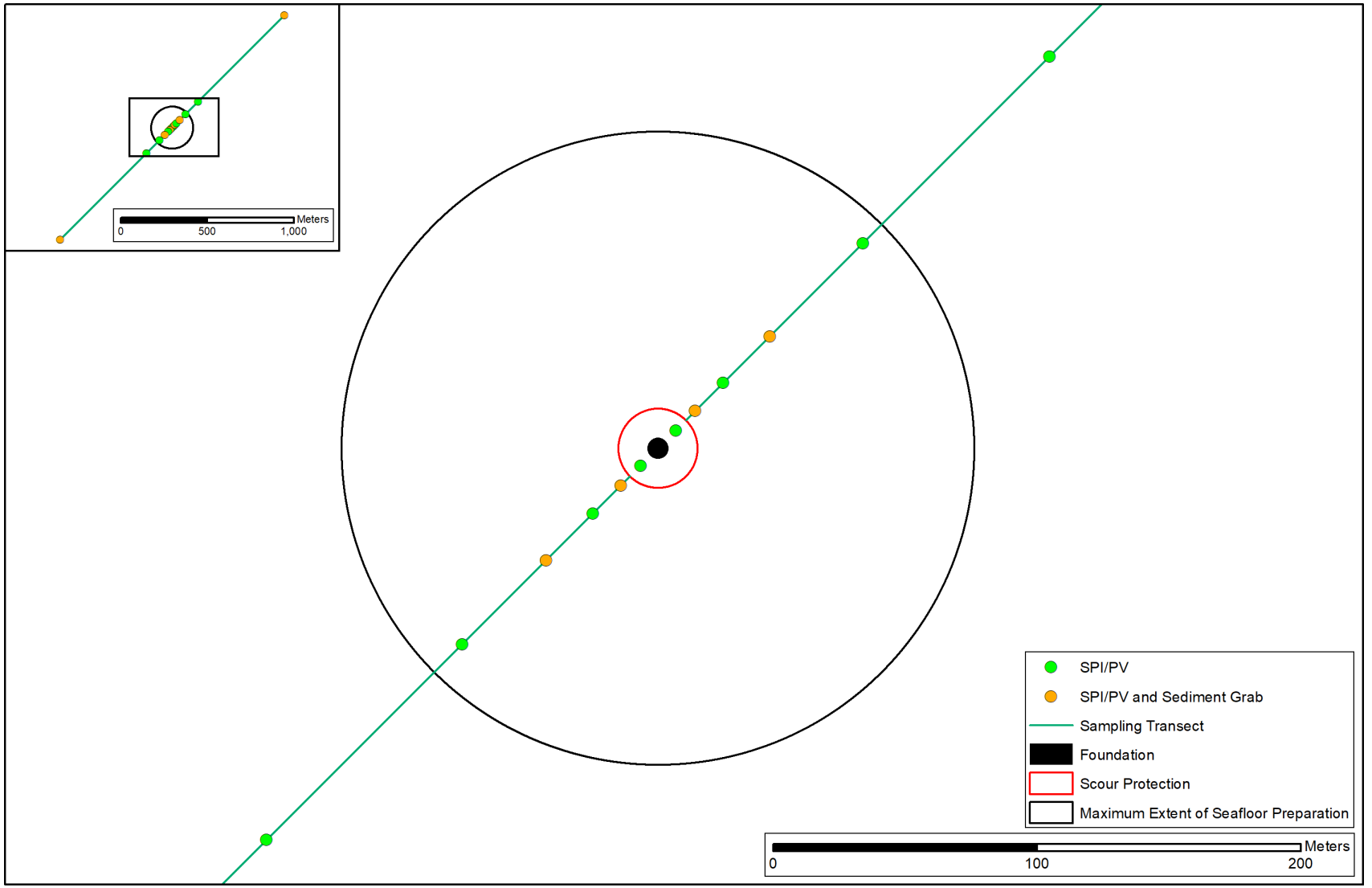
Year-Round



Example: Baited Remote Underwater Vehicle - Empire Wind



Example: Proposed Plan View - Empire Wind



Document Name: Equinor_2022_BMP_04_SPIPV_Targets_WTG | Coordinate System: NAD 1983 2011 UTM Zone 18N | Date: 9/20/2022

Thank you!