

Ensuring Sustainability Through Collaboration, Cooperation, and Cameras

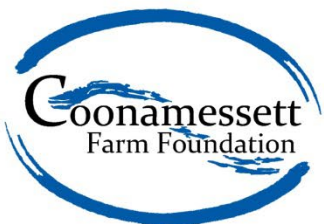
March 6, 2024

Tasha O'Hara

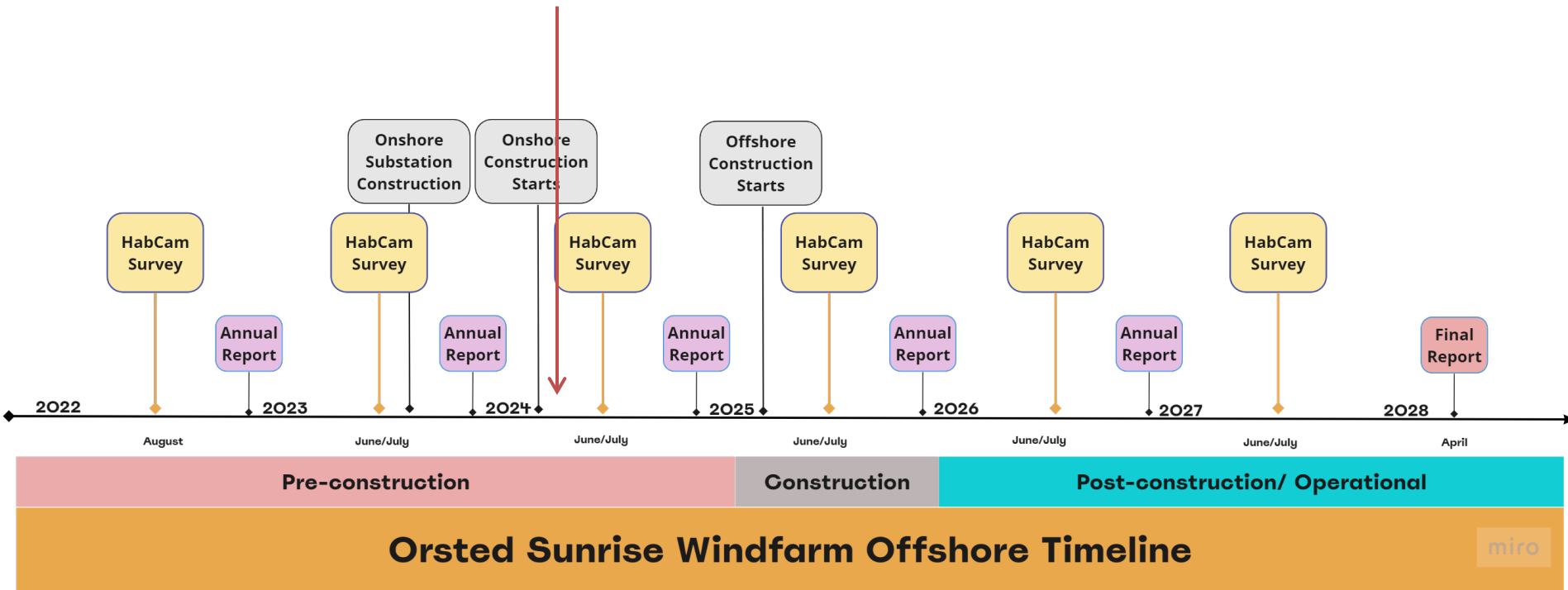
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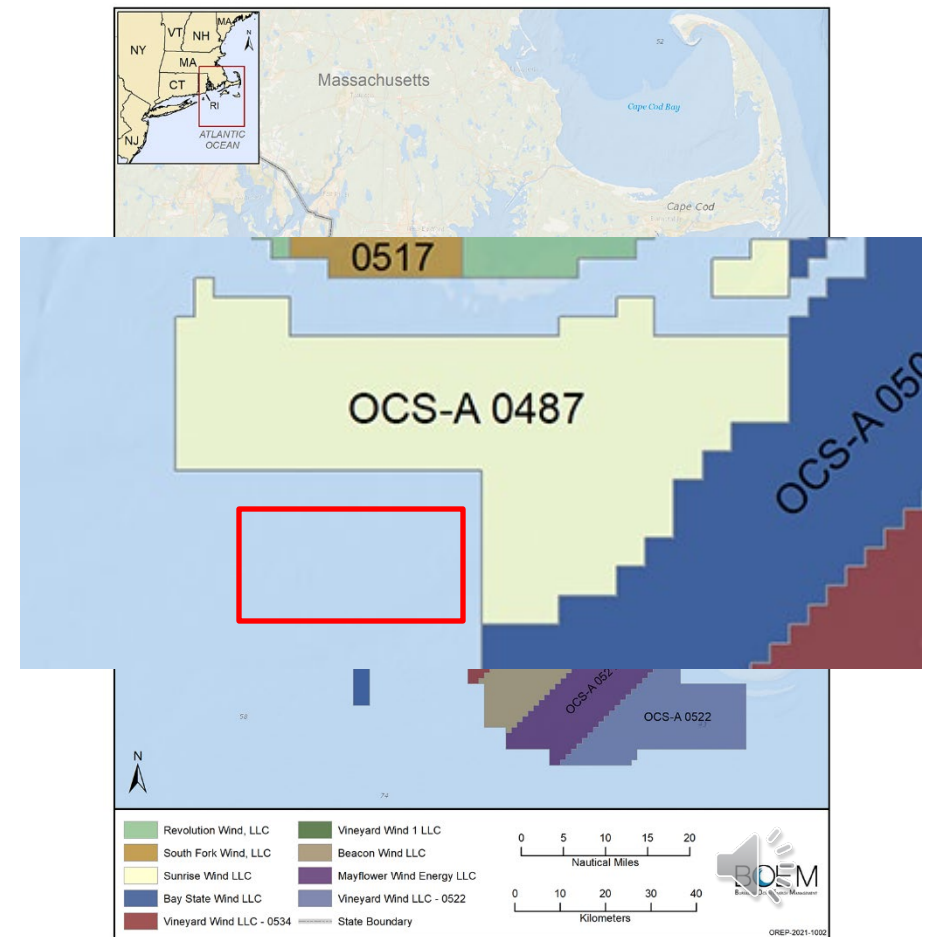


Sunrise Windfarm Monitoring Timeline



Sunrise Wind Farm HabCam Survey

- Project runs 2022-2028
- Surveying 2022-2027
- Non-extractive, non-lethal optical sampling
- Utilize vetted stock assessment tools, methods for stock assessment compatibility
- Commercial industry platform



Importance and Implications of Surveying

Impacts of offshore construction and turbine operation unknown for region and at planned scale

Emerging concerns addressed include:

- 1) How best to assess changes in the marine environment due to wind farm construction
- 2) How to effectively survey while ensuring additional monitoring is minimally harmful to the environment
- 3) How to successfully foster co-existence, collaboration, and cooperation between stakeholders

Importance and Implications of Surveying

Fill in knowledge gaps regarding impacts of offshore development on marine species and habitats

Addressing fisheries stakeholders' coexistence concerns

- New platform to reach stakeholders/voice concerns

Long term monitoring essential for documenting the response of biodiversity to environmental change

Integrated optical surveying ideal for understanding:

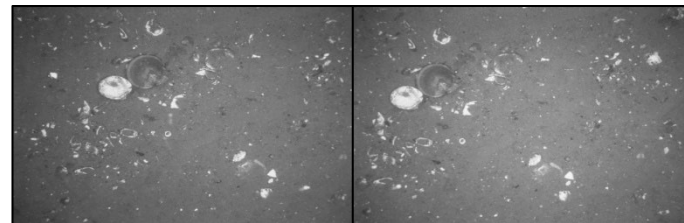
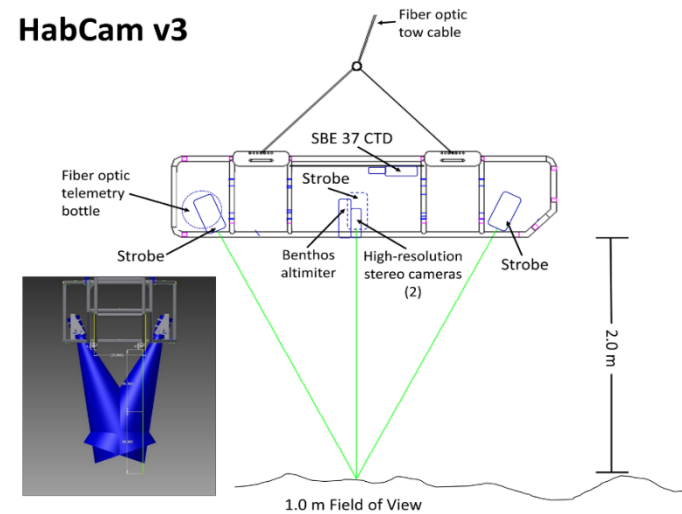
- behaviors and spatial relationships between animals
- how animals utilize their habitat
- how these factors change due to measurable environmental shifts



HabCam v3 Vehicle Overview

System Highlights

- Stereo cameras
- Strobes
- CTD, altimeter
- Telemetry / Control Bottle
 - Attitude sensor
 - Media converters
 - Network hardware
- Average tow speed: 4.5-5.2 knots
- 6 images/second



Sunrise Wind Farm HabCam Survey

Long-term Project Goals

Monitor and evaluate ecosystem changes before, during, after construction

1. Changes in species abundance, density, distribution, and size
2. Benthic habitats and sediment shifts
3. Environmental factors such as salinity, temperature changes or anomalies

Collaborate with stakeholders to foster cooperation and build opportunities



Survey Design

Intensive sampling across survey areas

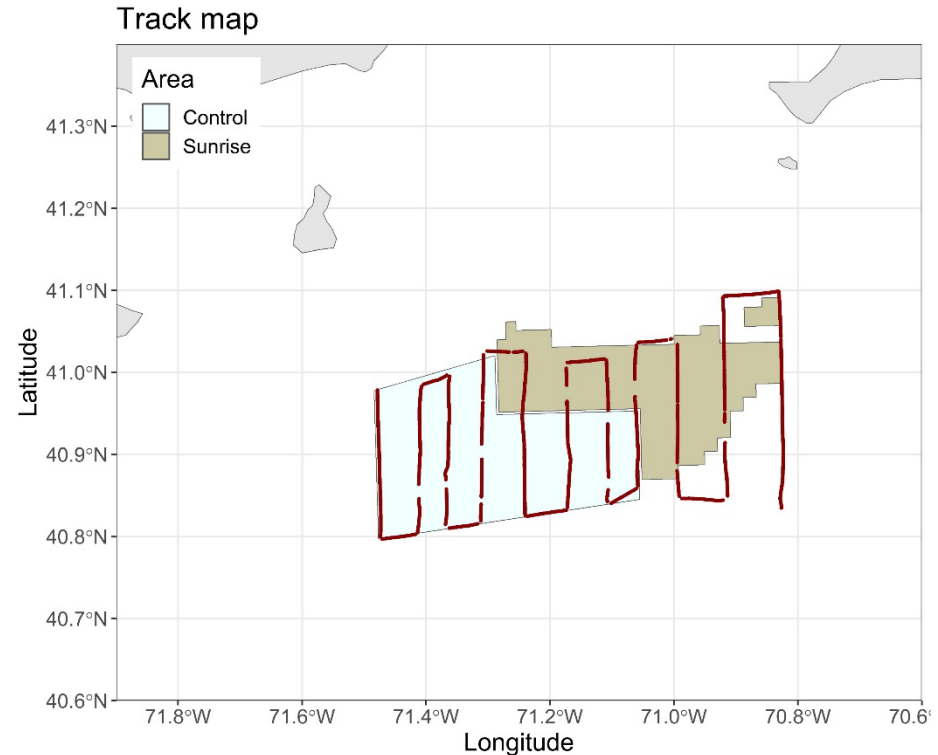
- 165nm track surveyed each year (May-Sept)
- ~3nm spacing between transects

Annotation rate 1:100

- “Station” distance ~40m
- >1850 images annotated annually
- Modified for obstacle avoidance

Control Area

- Adjacent, non-WEA
- Similar size, depth, vessel traffic, fishing effort, sediment



Map of completed survey track in 2023.

Data Analysis

All annotators trained and assessed on control set

Similar timing, methods, annotation protocol to NOAA HabCam v4 and RSA v3 Scallop survey

Biomass estimates calculated using stratified mean estimation by depth, area and Ordinary Kriging

Images aggregated over ~1000m segments



VIA annotator GUI. Annotations are made for pre-determined species and substrate lists.

Products from HabCam surveys

Raw TIFF and JPEG
Images

Information on
Inter- and
Intraspecies
Relationships

Identification of
Recruitment
Events

Length Frequency
(scallops)
• Growth

Habitat and
Sediment
Identification

Temperature and
Salinity Maps
• Anomalies

Density and
Distribution Maps
• Predator/Species
Tracking

Image Mosaics

Biomass Estimates
(Total &  Exploitable)

Collaboration Efforts

“Support sustainable fisheries operations and renewable energy sources for the benefit of the public”

Commercial industry platform

- F/V *Kathy Marie*
- New Bedford, MA

Collaborative planning meetings

Cooperation in monitoring and research

Data dissemination efforts



Collaboration Efforts and Outcomes

Supplementary work for local communities

Increased safety protocols/equipment onboard/training

Data share with government and regional groups to support stock assessment (2022)

- Possible due to survey similarity



Preliminary takeaways

- Overall composition of species similar between areas and years
- Strong variation in abundance between Y1 and Y2, possibly due to fishing, timing, nearby construction
- Long-term monitoring necessary; annual variability may be great and due to a myriad of factors
- Modeling wind surveys after stock assessment surveys is valuable for regional management
 - Comparability warrants greater consideration in survey planning process
- Relationships between commercial fisheries, wind, and environmental groups can be fraught
- Collaboration with local fishing groups and businesses needed to expand opportunities and promote trust and co-existence



Questions?

