Learning from the Experts Webinar Series

# Bird Monitoring Methodologies for Offshore Wind

**Pam Loring**
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U.S. Fish and Wildlife Service
Division of Migratory Birds

**April 5, 2023**

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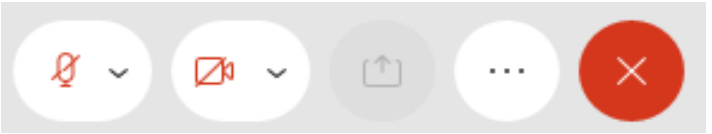

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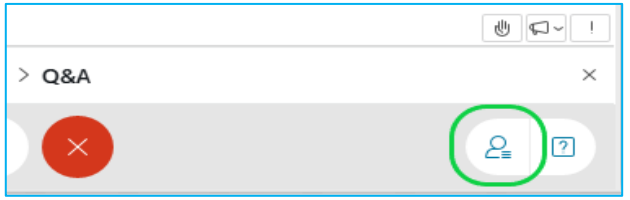


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# Learning from the Experts

**This webinar series is hosted by NYSERDA's offshore wind team and features experts in offshore wind technologies, development practices, and related research.**

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# Coordinated Bird Monitoring Methodologies for Offshore Wind

Pam Loring

U.S. Fish and Wildlife Service

Division of Migratory Birds, North Atlantic-Appalachian Region

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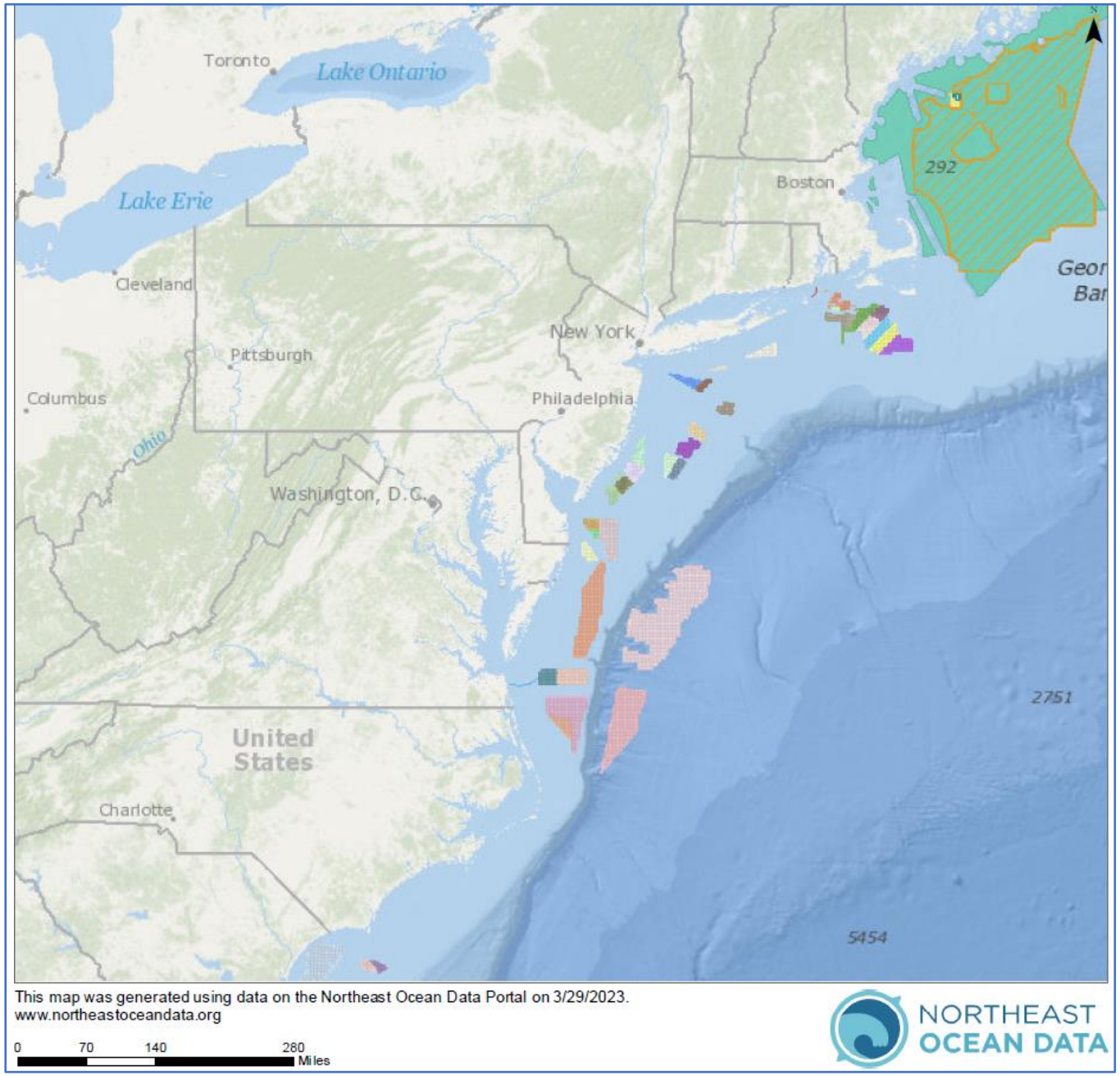
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Charlotte
This map was generated using data on the Northeast Ocean Data Portal on 3/29/2023.
www.northeastoceandata.org
0 70 140 280
Miles
NORTHEAST OCEAN DATA

# Effects of offshore wind on birds

- Varies by species group
- Habitat alteration and loss
- Displacement
- Collision risk

# Information needed to assess risk

- Species composition
- Distribution and abundance
- Movement patterns
- Flight altitudes
- Habitat use
- Interactions with turbines
- Changes pre and post-construction

# Methods for monitoring birds offshore

- Boat surveys
- Aerial surveys
- Individual-based tracking
- Passive acoustics
- Cameras
- Radar
- Strike indicators

# Challenges

- Environmental challenges offshore (remote, adverse weather)
- Limited methods for collecting data, especially at night
- Highly dynamic, variation across space and time
- Spatial and temporal trade-offs with various technologies and methods available for monitoring
- Technologies can be used in combination to provide complimentary information (e.g. use of cameras and radar)
- Coordination across sites, studies, and cooperators to maximize information

# Opportunities

- Technologies can be used in combination to provide complimentary information (e.g. use of cameras and radar)

- Coordination across sites, studies, and cooperators to maximize information

# Case study: Coordinated automated radio telemetry

Radio tags are put on animals.

Stations collect data from tags.


Data are processed and used for research and conservation.

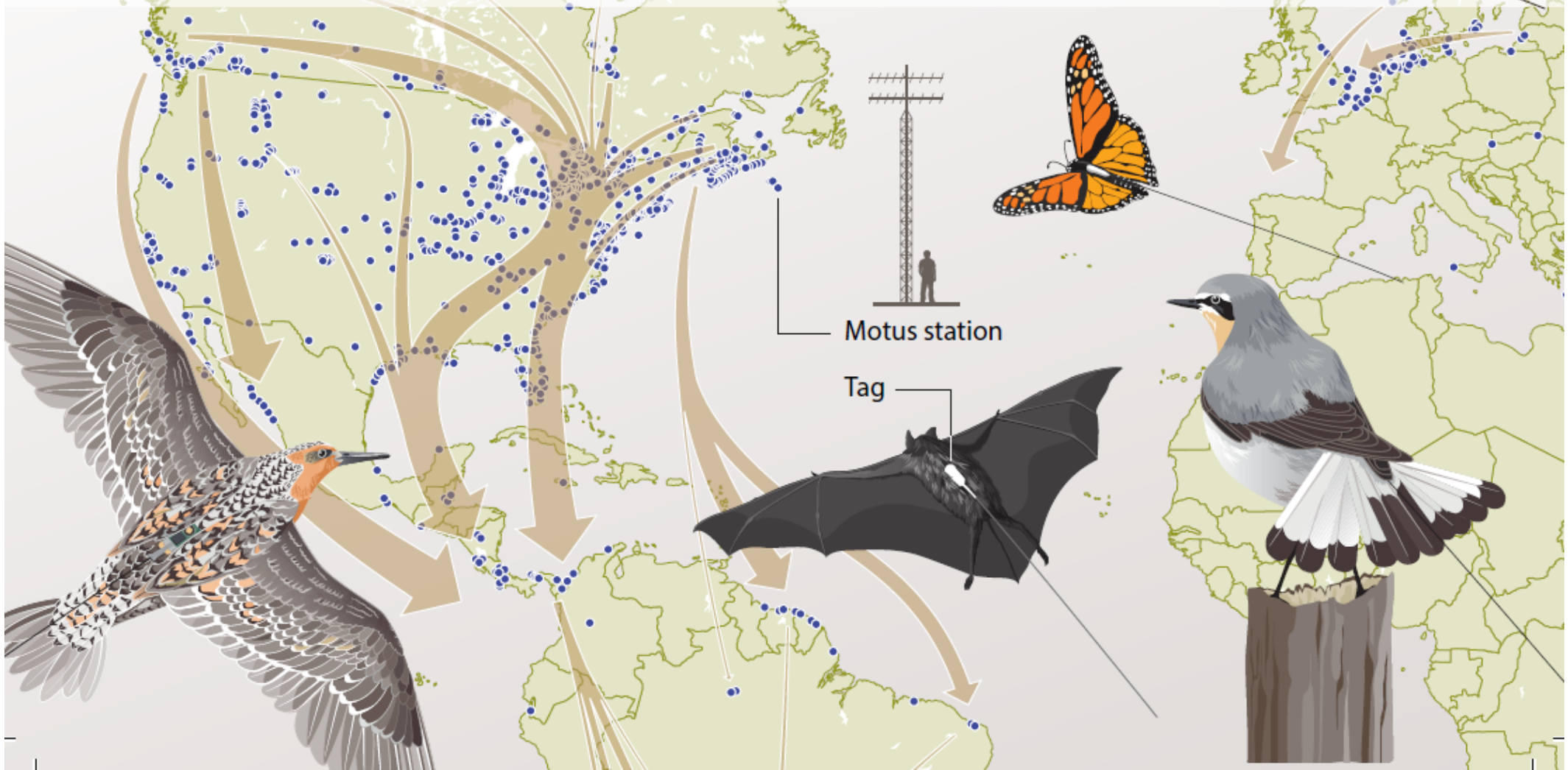
Tags:

Battery 

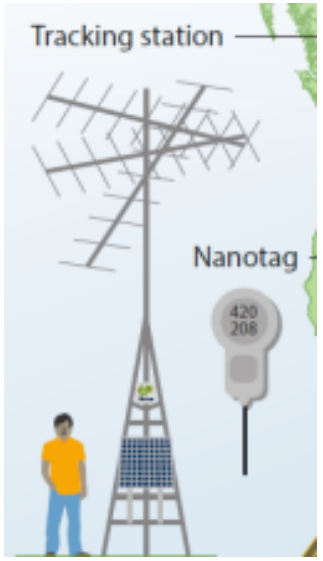
Solar 

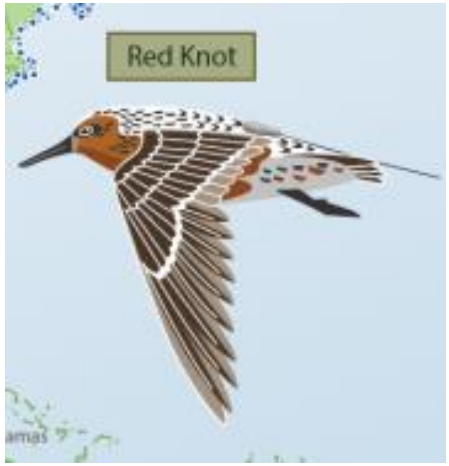
Motus

# A collaborative research network tracking wildlife movement for conservation

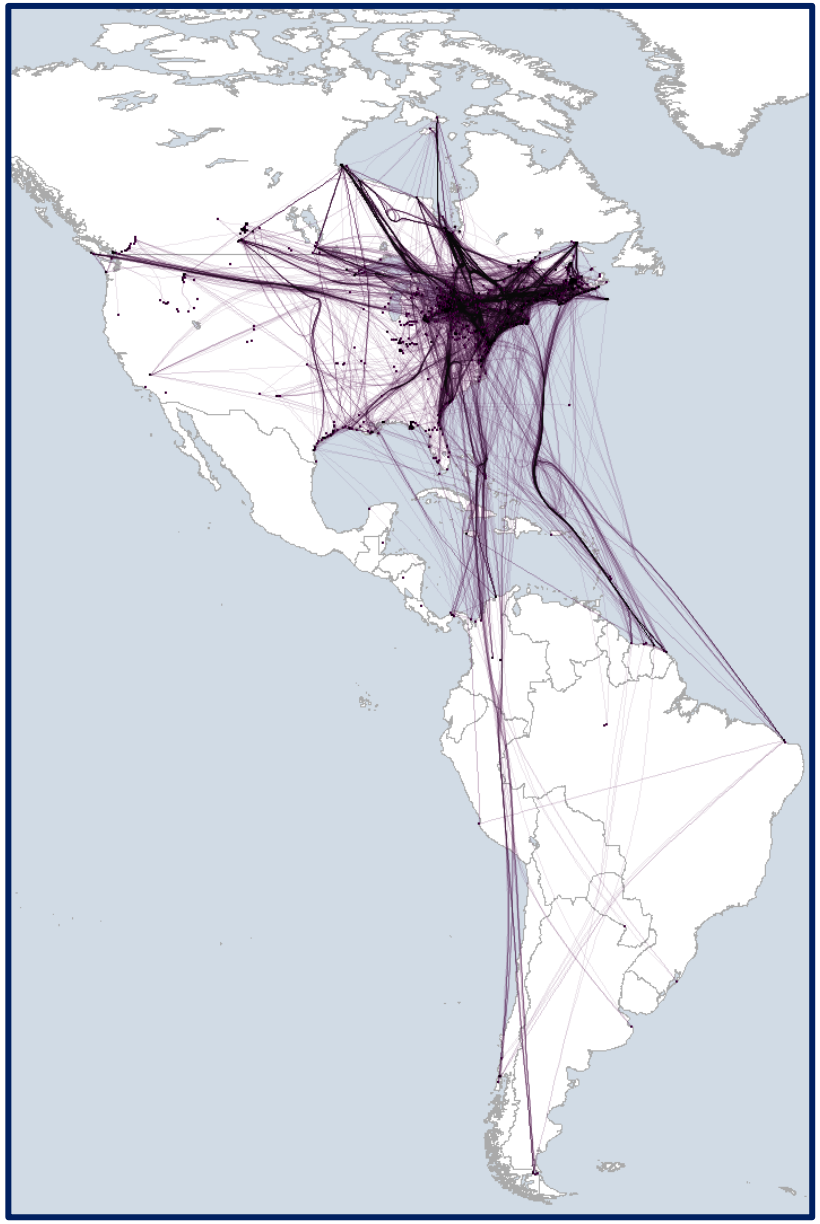


Motus
Wildlife Tracking System




Stations in Western Hemisphere



Tracks from tagged shorebirds

# Offshore Motus: Opportunities

- Continuous monitoring of offshore wind project areas
- Potential to assess cumulative exposure across lease areas
- Large sample sizes leveraged by collaborative network
- Centralized data management through Motus

# Offshore Motus: Challenges

- Offshore infrastructure – e.g. turbines, buoys
- Offshore environments (weather conditions, site access)
- Consistent deployment and operation across industry projects
- Timely data transfer from offshore sites
- Tagged birds and bats from target species and populations of interest
- **A strategic approach is needed to deploy stations and tags to effectively**

# Development of Monitoring Protocols and Guidance for Automated Radio Telemetry Studies at Offshore Wind Farms





# Project Team

**USFWS Migratory Birds:** Pam Loring, Scott Johnston

**Biodiversity Research Institute:** Kate Williams, Andrew Gilbert, Evan Adams, Julia Gulka, Ed Jenkins

**Univ. of Rhode Island:** Peter Paton, Doug Gobeille, Erik Carlson, Rob Deluca

**Birds Canada:** Stu Mackenzie

**NYSERDA (funding):** Kate McClellan Press, Gregory Lampman





## Overall project goal:

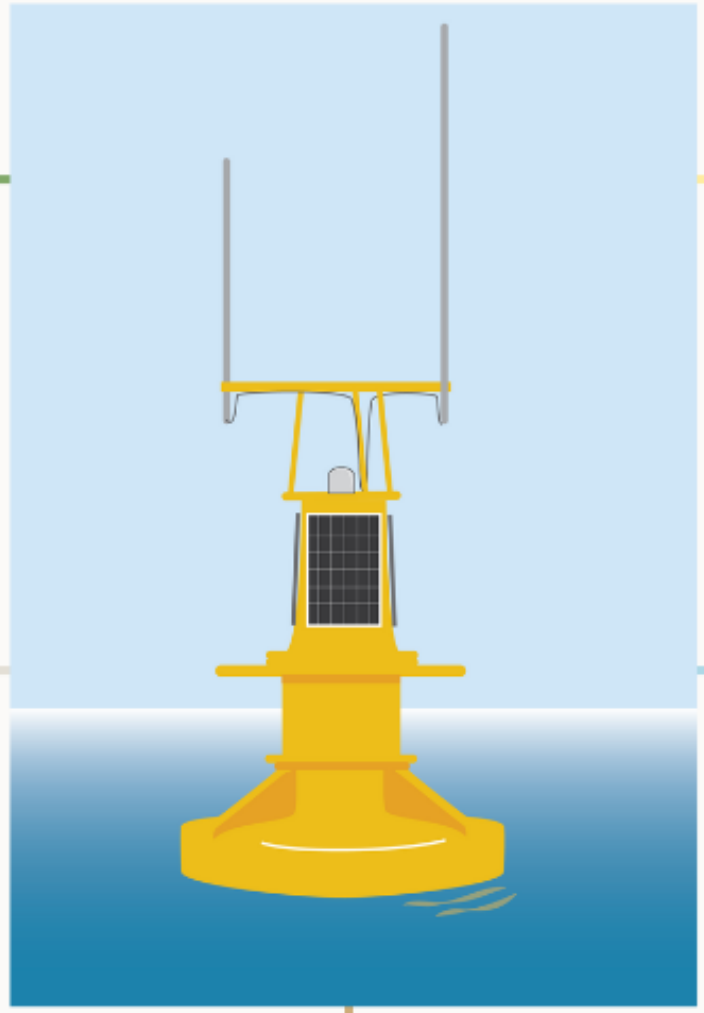
To develop standardized protocols for using Motus to monitor birds and bats in offshore environments.

# Objectives

- Strategically increase the coverage of offshore stations in the U.S. Atlantic
- Coordinate tag deployment efforts to optimize sample sizes and information gains
- Help make automated radio telemetry a consistent component of offshore monitoring
- Improve our understanding of the offshore movements and habitat use of many bird and bat species in the U.S. Atlantic by leveraging the collaborative infrastructure of the Motus network

**Simulation Study**
Evaluates Motus design challenges and estimates detection probability of avian taxa

**Study Design Tool (IDIOMS)**
Informs offshore Motus study designs and helps optimize coverage of wind energy projects



**Data Framework**
Facilitates coordination and dissemination of Offshore Motus data for the U.S. Atlantic

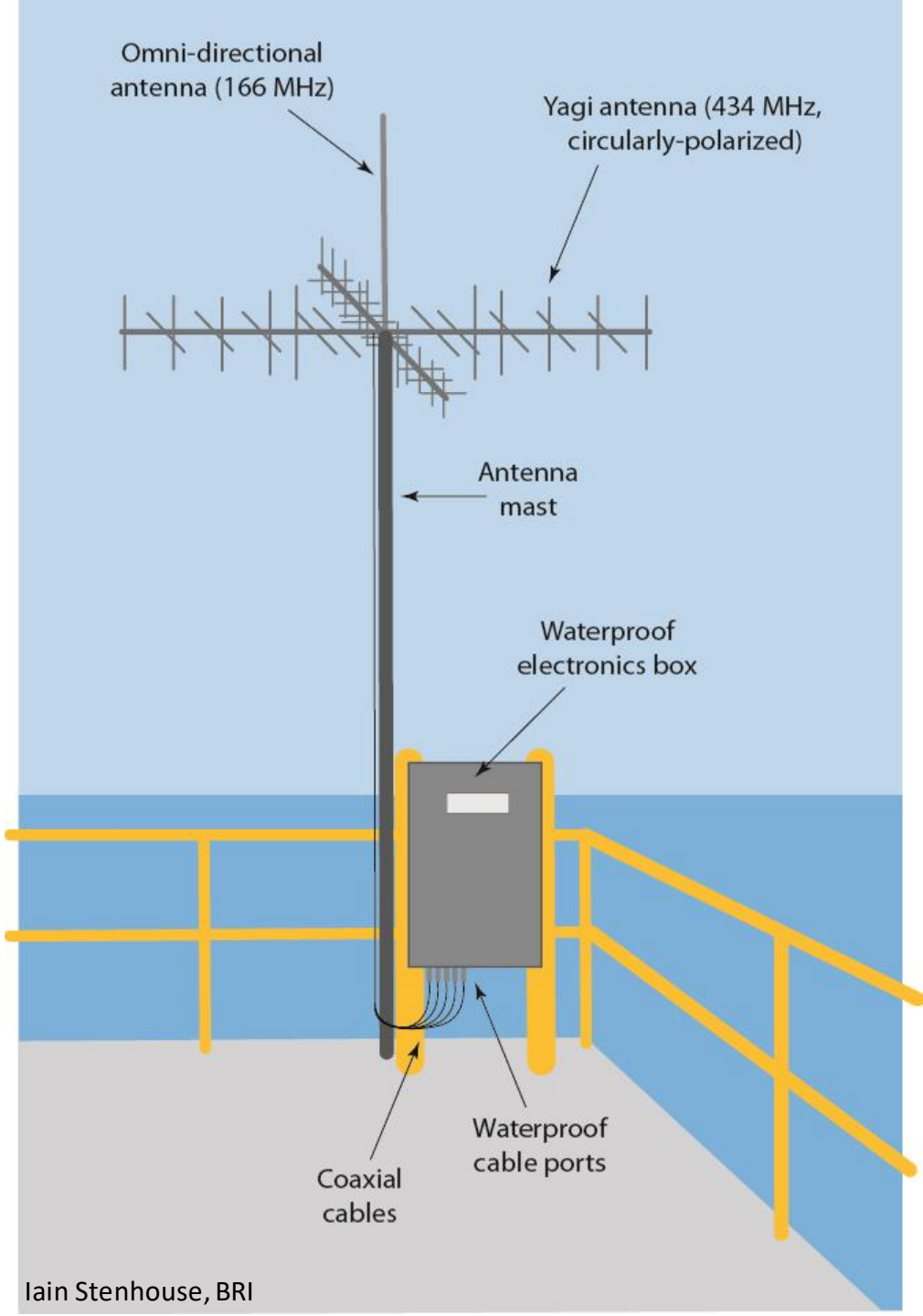
**Monitoring Framework**
Recommends approaches for using Motus in relation to offshore wind energy development

**Guidance Document**
Describes methods for deployment and operation of Motus stations on offshore structures

**Infographic by**
**E. Eckel and I. Stenhouse,**
**Biodiversity Research Institute**

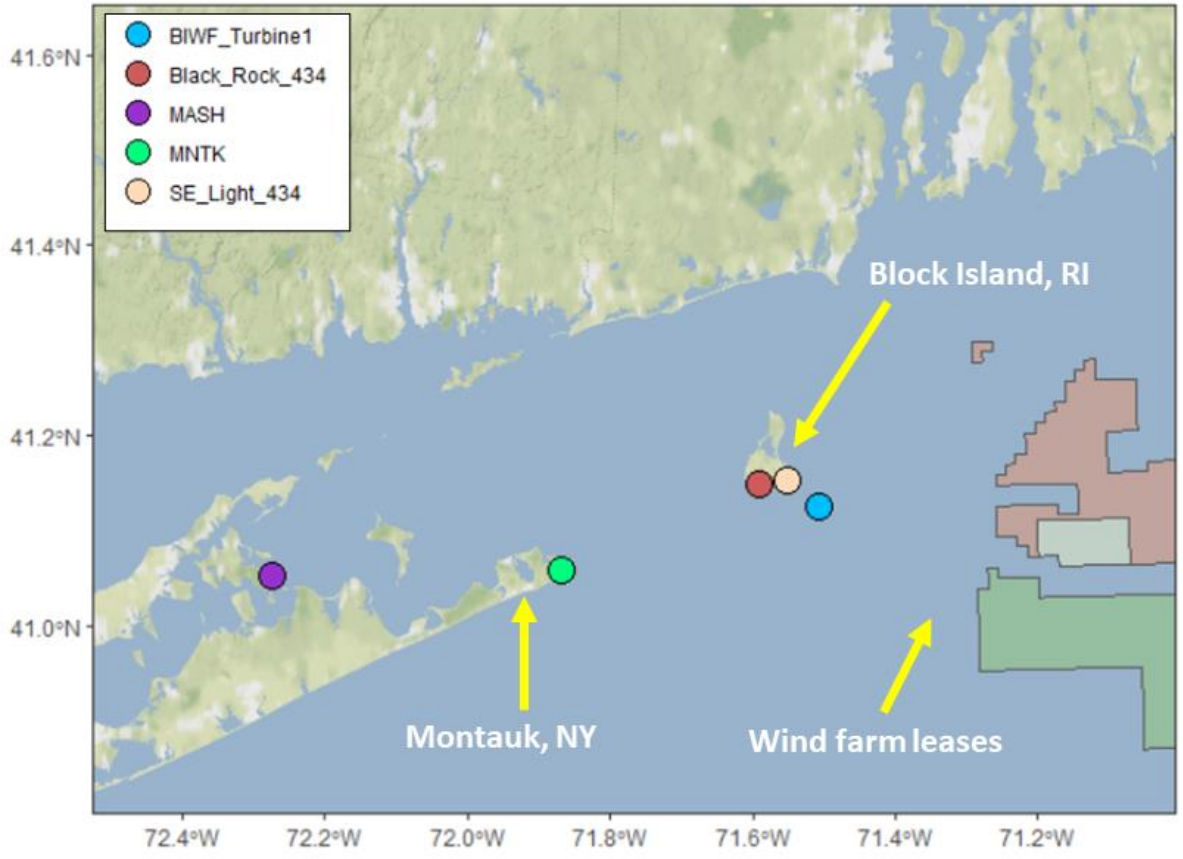
# Guidance Document

- Technical specifications
- Detailed workflows
- Field data sheets for standardized metadata
- Developed with Project Advisory Committee
- Informed by field work at Block Island Wind Farm and in coordination with buoy deployments in Atlantic




Iain Stenhouse, BRI

# Field testing at Block Island Wind Farm





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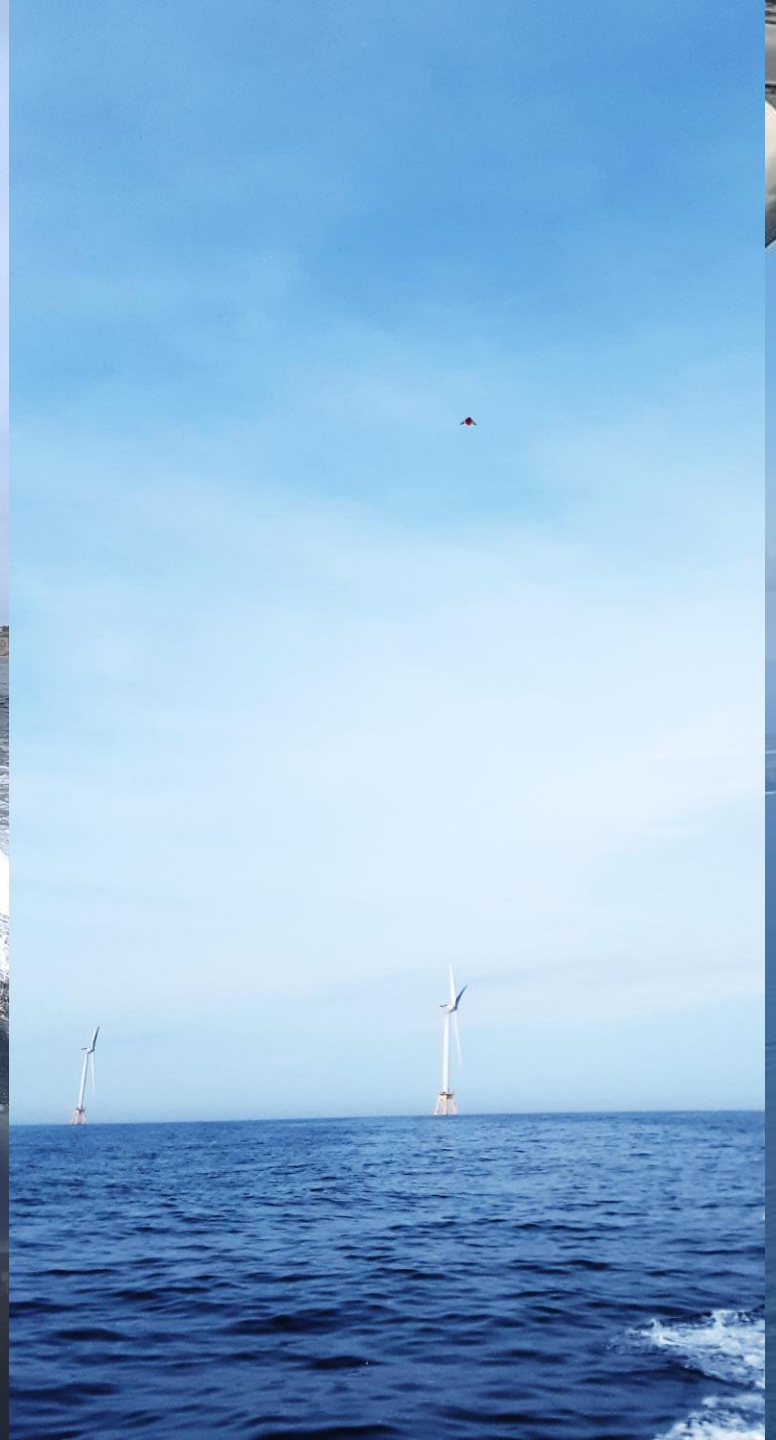
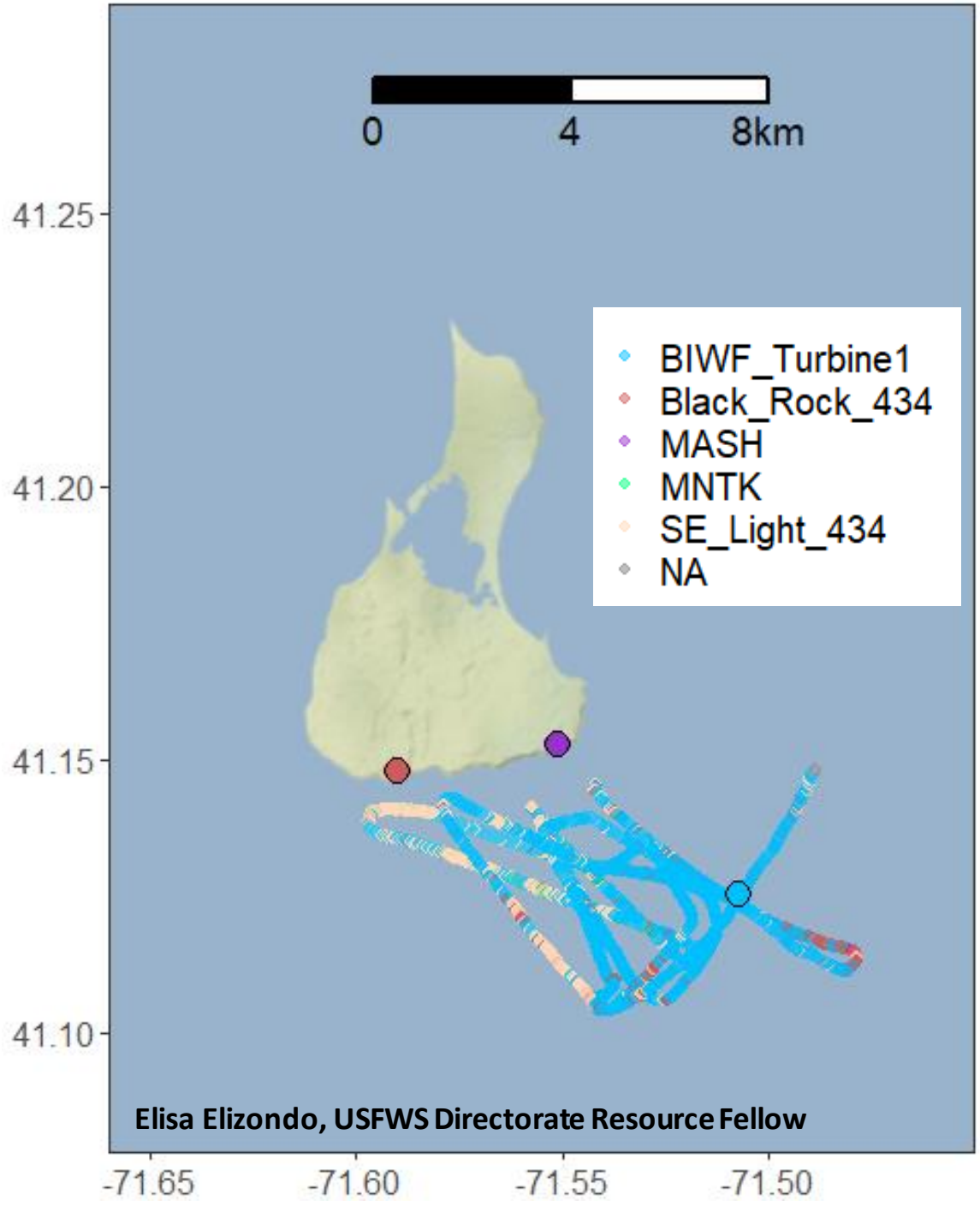


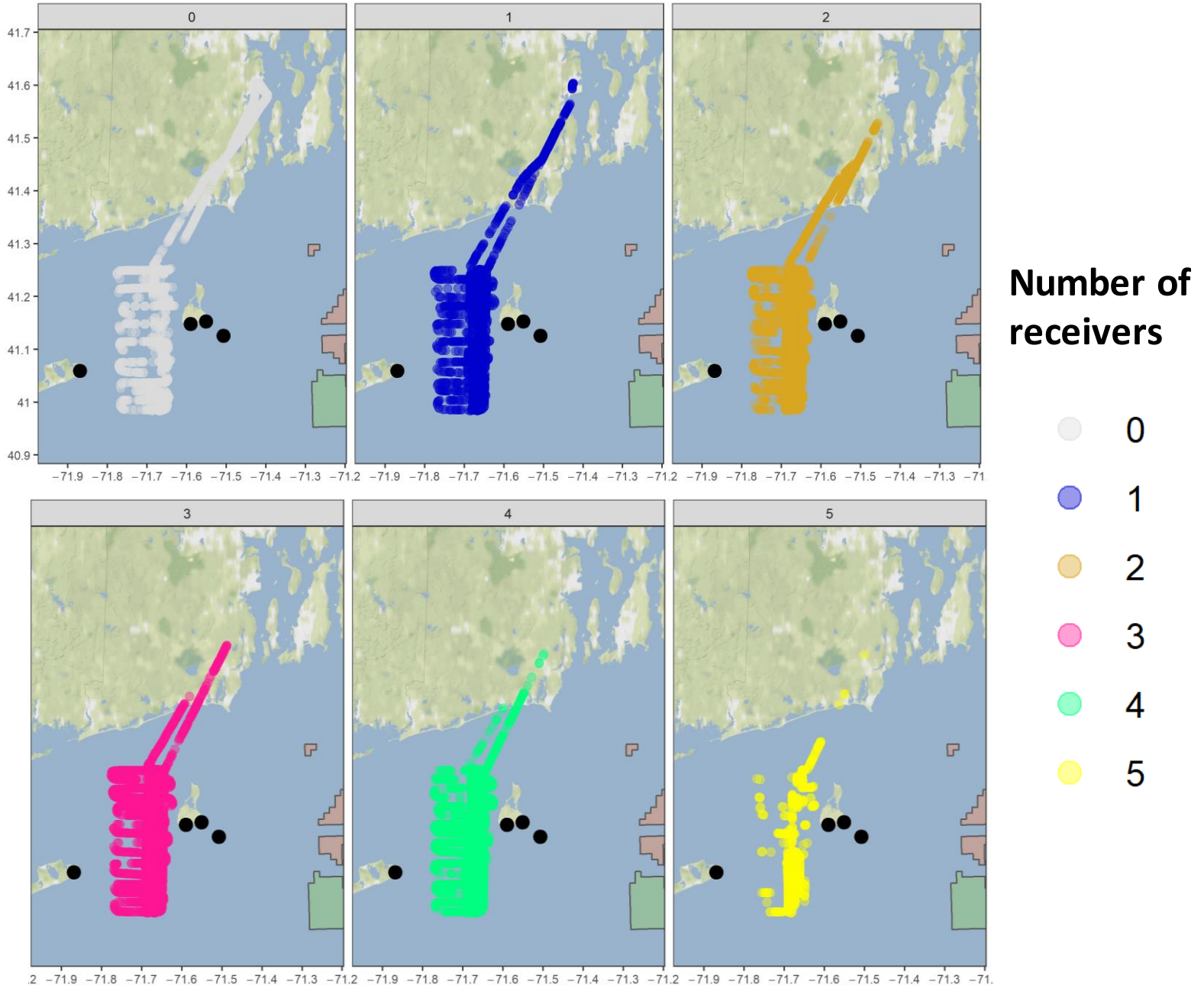

# Kite survey

- Survey around Block Island Wind Farm
- Altitude up to 130 ft ASL
- Tag and GPS pinged every second
- 96% of all tag pings detected by at least 1 station on Block Island
- Turbine station detections in blue
- Detections from stations on Long Island, 30-50 km away



# Plane survey

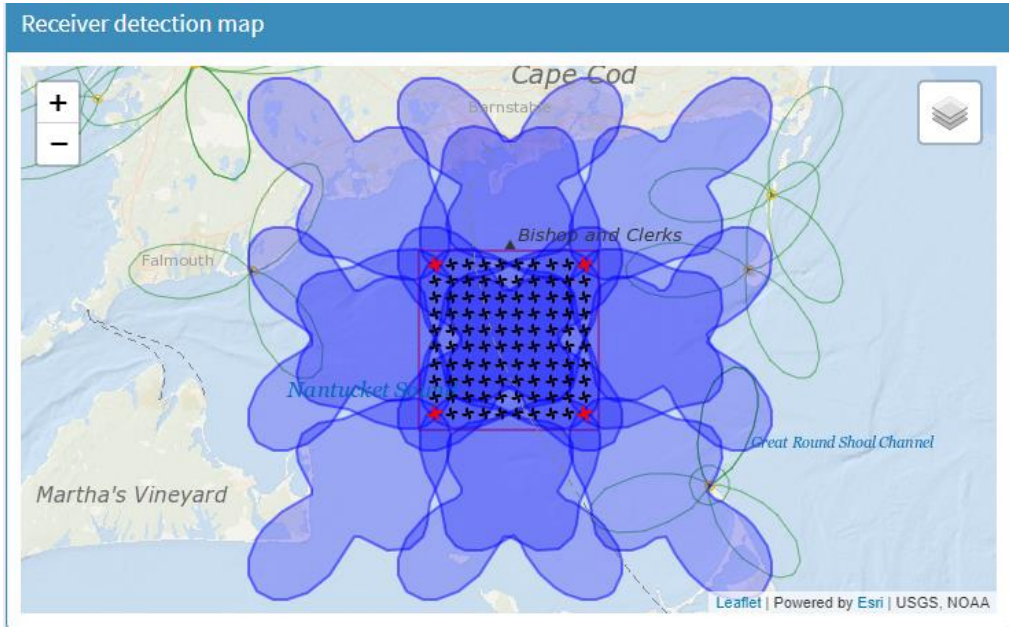
- Partnered with RI Civil Air Patrol
- Altitude up to 1300 ft ASL
- Simultaneous detections by up to 5 different receivers
- Data from surveys used to develop 3-D antenna coverage models and triangulation models (URI)




Elisa Elizondo, USFWS Directorate Resource Fellow

# Study Design Tool (IDIOMS)

- Informing the Design and Implementation of Offshore Motus Systems
- R-Shiny app, uses antenna beam models from calibration surveys
- Optimize station numbers and locations
- Maps coverage from antenna beams
- Simulates seabird and shorebird tracks
- Results summarized in automated report




IDIOMS

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# Motus Data Framework

- Coordinates information among projects for offshore wind applications
- Developed in collaboration with Motus programmers from Birds Canada
- Includes new workflows and tools to coordinate and disseminate detection data, metadata, and summary reports from all tagged animals and Motus stations deployed for offshore wind energy applications in the U.S. Atlantic

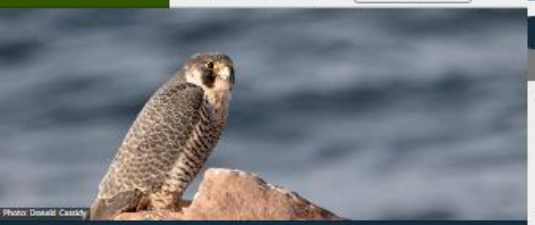
Motus

BIRDS CANADA OISEAUX CANADA

MOTUS ANIMAL

# Peregrine Falcon #37017

ACTIVE | Tagged on Oct 08 2021 | Switch Animal



## Animal summary

- 3 Contributing projects
- 4 Stations visited
- 1 Countries visited
- 4 Detections

## Latest activity

Tag detected: Peregrine Falcon #37017 on 2021-12-24 at Bowlegs South

## Affiliations

eBird | Audubon

Project: Atlantic Offshore Wind Pilot (#390)

Group: Atlantic Offshore Wind

## Tag metrics

Motus tag ID: 47191

Manufacturer ID: 344C0734

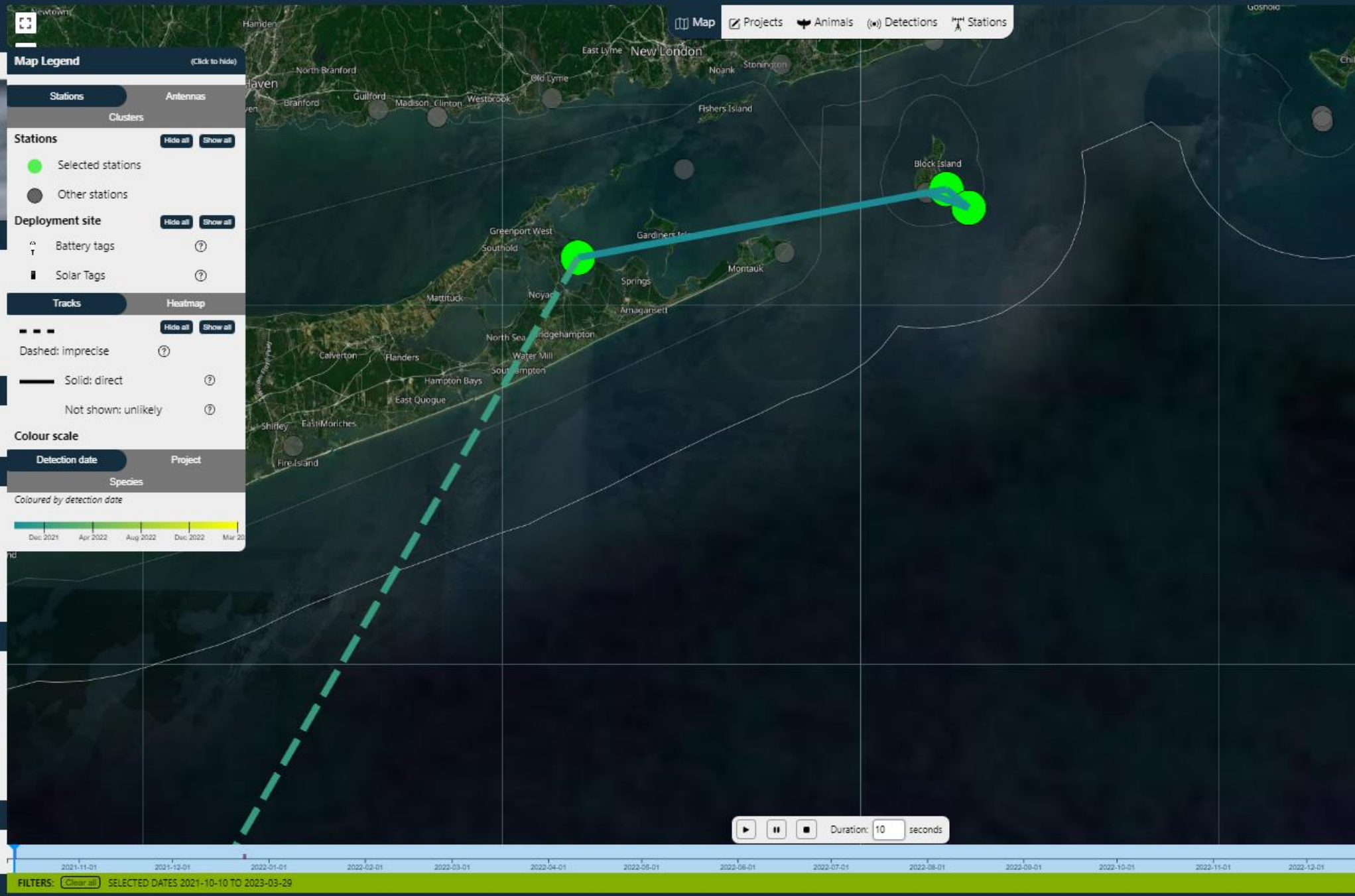
Tag model: LifeTag

Estimated lifespan: 1825 days

Estimated life remaining: 1288 days

## Other metrics

Tagging site: -71.5964, 41.1512



# Monitoring Framework

- Roadmap for offshore Motus studies
- Standardize methods for site-specific monitoring and reporting
- Coordinate information across sites for regional-scale analyses
- Develop centralized tag deployment strategies for population-level inferences
- Identify standardized data analysis methods to address high-priority information needs
- Facilitate regional coordination opportunities to maximize resources
- Recommend high-priority future actions

# Products are available online

- The products are now available on motus.org
- URL: https://motus.org/groups/atlantic-offshore-wind
- Living documents, updated as new information and technology becomes available

# Implementation

- Coordinating with developers and BOEM to implement offshore Motus workflows into monitoring plans

- Coordinating with stakeholders through the Regional Wildlife Science Collaborative to incorporate the recommendations into regional science plans and collaborations

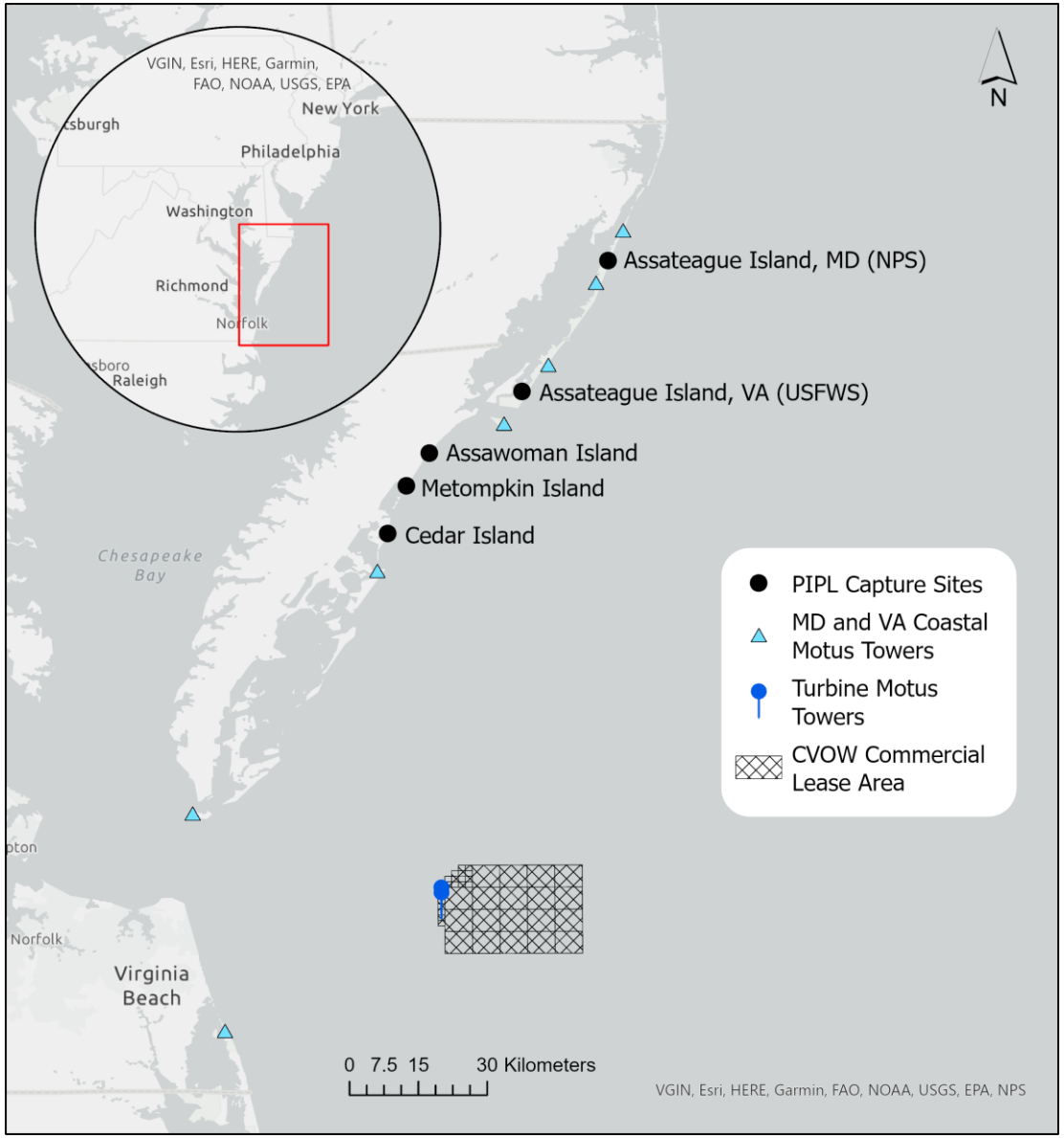
RWSC

Regional Wildlife Science Collaborative for Offshore Wind

# Current efforts: CVOW collaboration

# Current efforts: CVOW Piping Plover study

- Use Motus to track Piping Plovers
- Tag 25 adult Piping Plovers at nesting sites along eastern shore
- Track movements using a network of coastal and offshore Motus stations


**Map: Katie Walker (USFWS)**

# Project WOW:
# Wildlife and Offshore Wind

A Systems Approach to Research and Risk Assessment for Offshore Wind Development from Maine to the Carolinas

U.S. DEPARTMENT OF ENERGY

BOEM
Bureau of Ocean Energy Management

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 ($7.5 million)

# Project WOW Motus components (2023-2025)

- Update the existing network of Motus stations on Block Island
- Conduct calibration surveys to refine methods and models
  - Double-tag seabirds
  - Use of drones
- Field test new antenna designs and methods for remote data retrieval for offshore stations
- Inform model development for estimating 3-D flight paths from Motus data
- Publish results in a peer reviewed journal article

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# Acknowledgements

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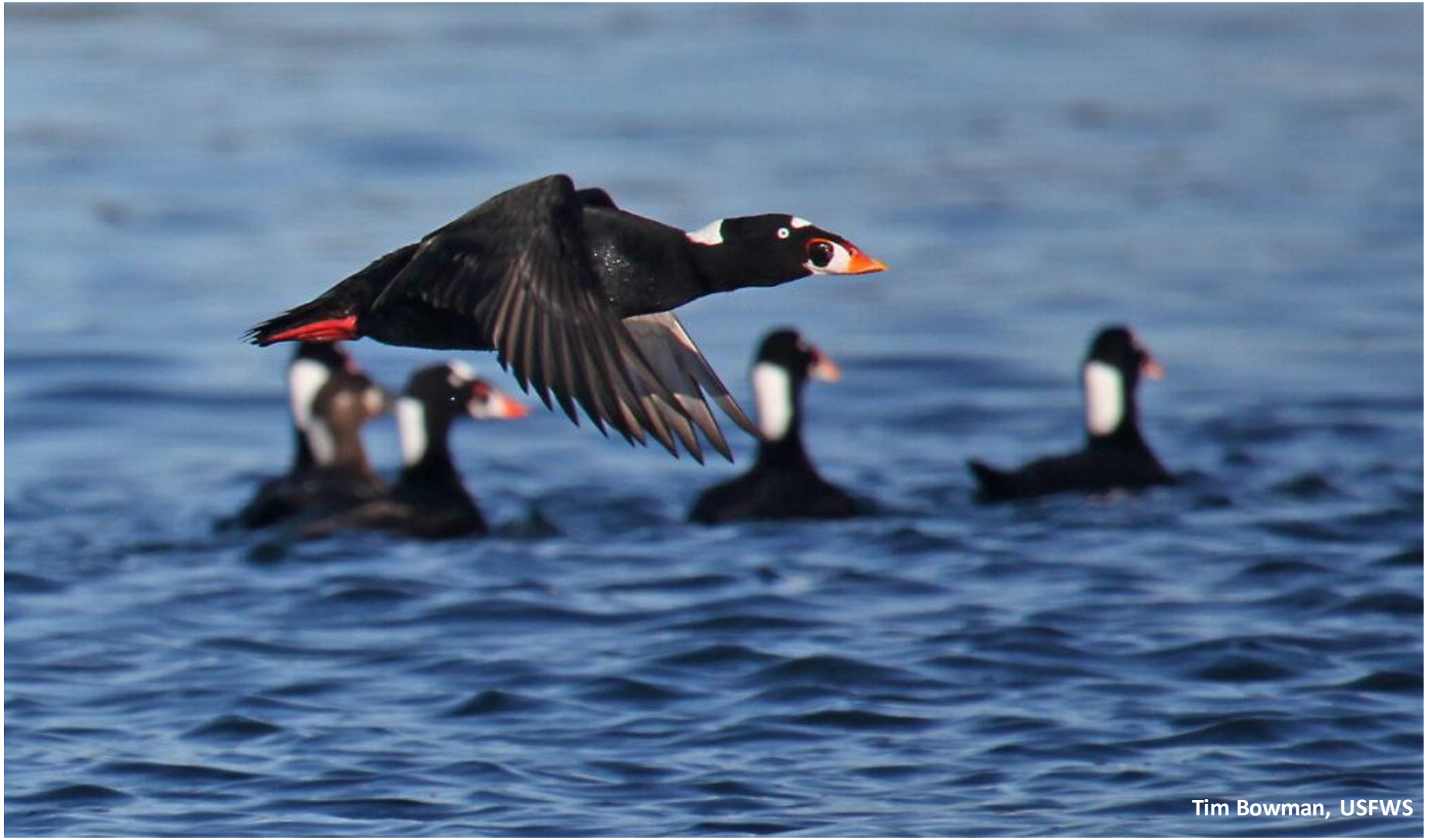
# Thank you!




Contact: pamela_loring@fws.gov

# Coming Soon

**May 10, 1:00 p.m. ET**

## Offshore Wind Reviews under Section 106 of the National Historic Preservation Act

**Bureau of Ocean Energy Management**

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