

# SPATIAL AND TEMPORAL DYNAMICS OF FISH IN AN OFFSHORE WIND LEASE AREA

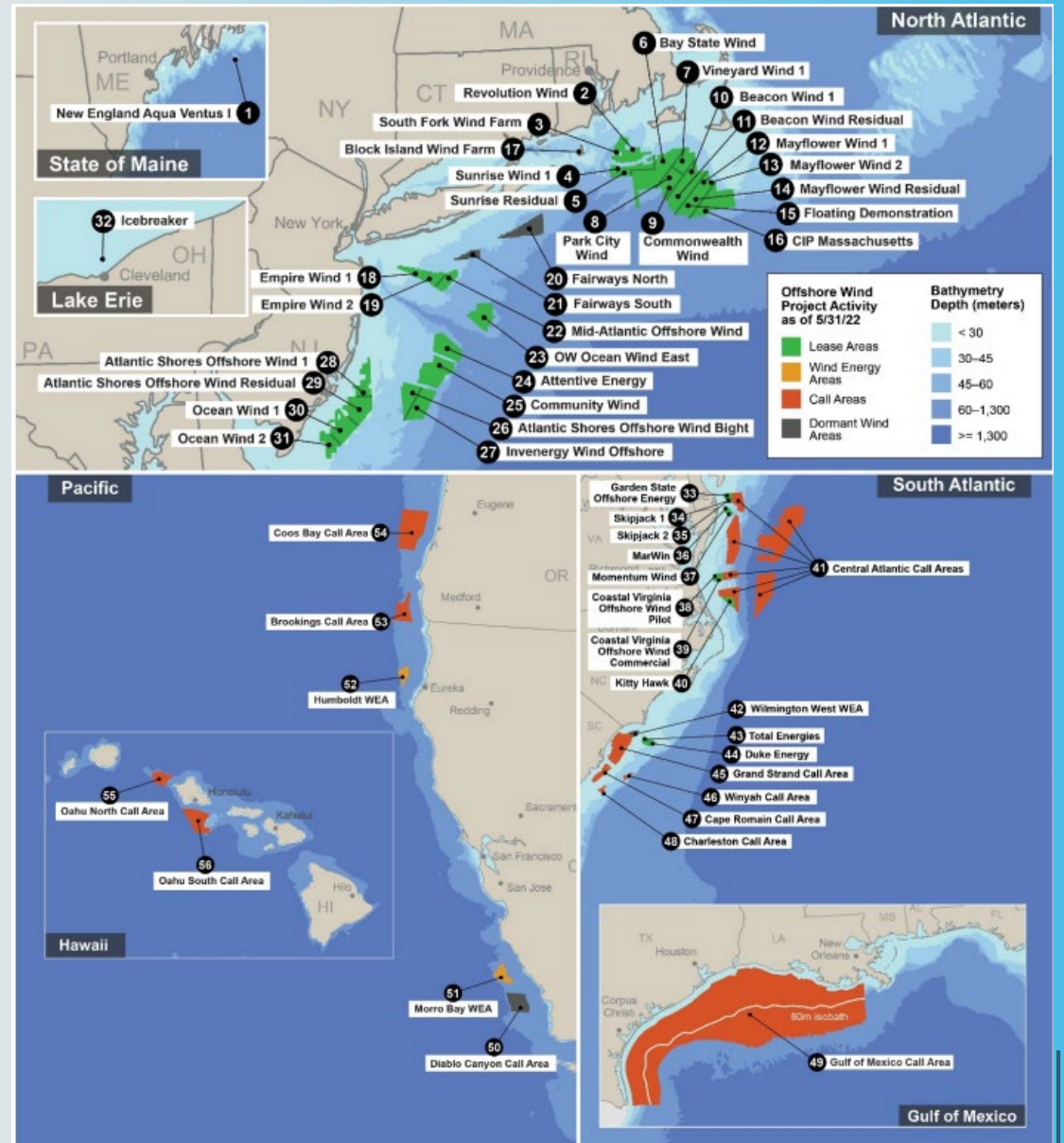
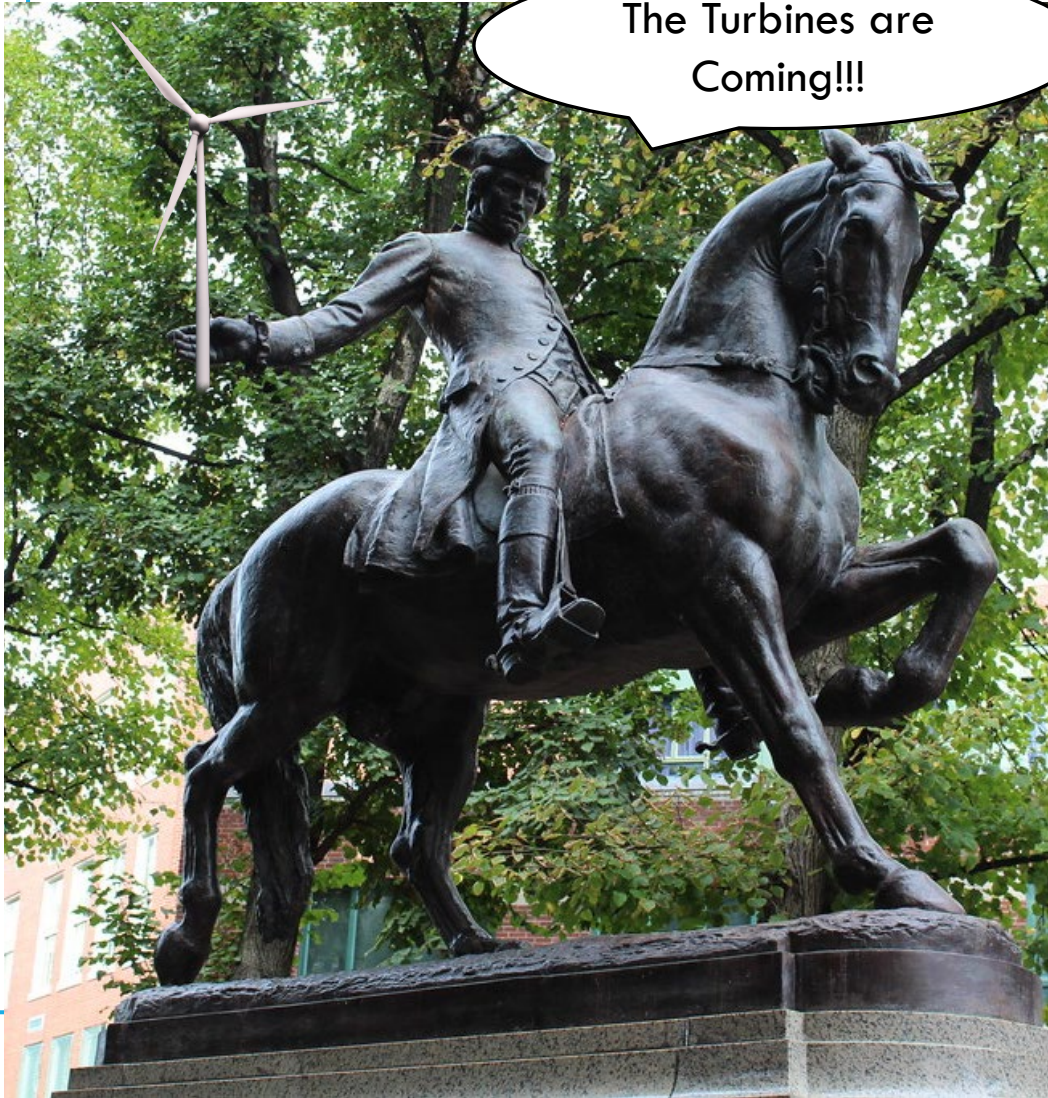
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# ATLANTIC OFFSHORE WIND DEVELOPMENT



# VINEYARD WIND 1



## First commercial-scale offshore wind project in US

### Project Details:

- 15 miles (~25 km) south of Martha's Vineyard, MA
- 62 GE Haliade-X Turbines (13 MW)
  - 1 nm. grid spacing
- 1 Electric Service Station
- 800 MW Capacity = 400,000 homes
- Project Area = 306 sq. km.

### Project Highlights:

- OCS-A 0501 Leased in 2015
- Offshore Construction started in 2023
- First power: January 2, 2024



# VINEYARD WIND 1 – FISHERIES MONITORING PLAN



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March 26 2019

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Demersal Otter Trawl Survey



Benthic Imaging Survey



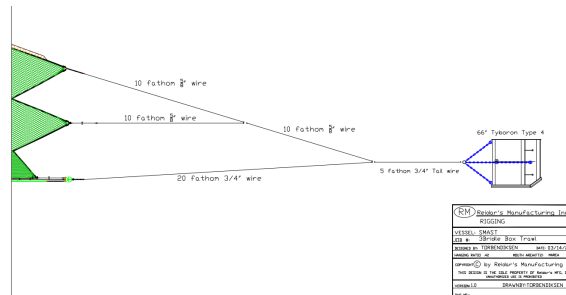
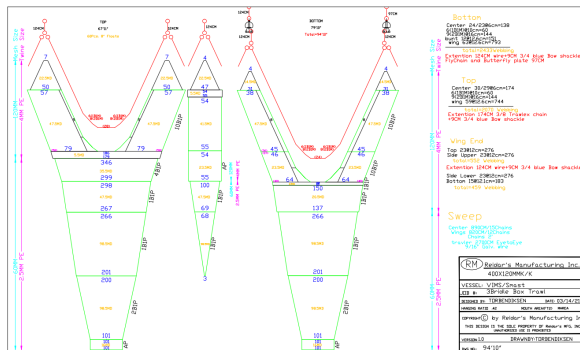
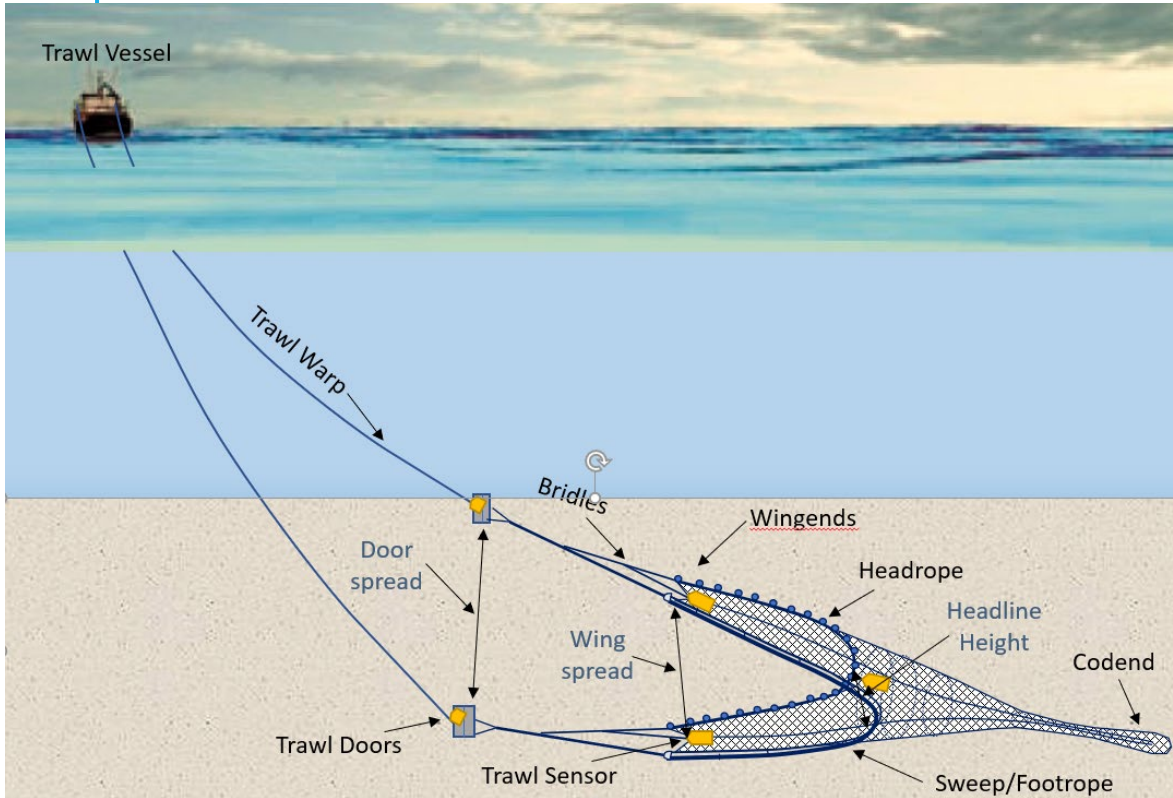
Ventless Trap, Black Sea Bass  
Pot & Plankton Survey



Photo Credit: NEAq

Acoustic Telemetry  
Highly Migratory Species

# ADOPTION OF NEAMAP TRAWL AND SURVEY PROTOCOL



## NEAMAP trawl

- Three-bridle, four-seam bottom trawl developed by Northeast Trawl Advisory Panel
- Thyboron IV 66" door
- Uses a "flat-sweep" to reduce escape of fish under the net
- The use of 1" knotless liner in the codend to retain juvenile fish

## NEAMAP survey protocol (Bonzek et al., 2008 )

- Commercial fishing vessel
- Tow duration: 20 min
- Tow speed: 3.0 knots
- Daytime only: 30 min after sunrise – 30 min before sunset

## Compliments NOAA and NEAMAP surveys Regional data integration

Provides consistency between regional surveys, and possible incorporation of high-resolution data for regional ecosystem assessments



# SURVEY OPERATIONS



## Four seasons

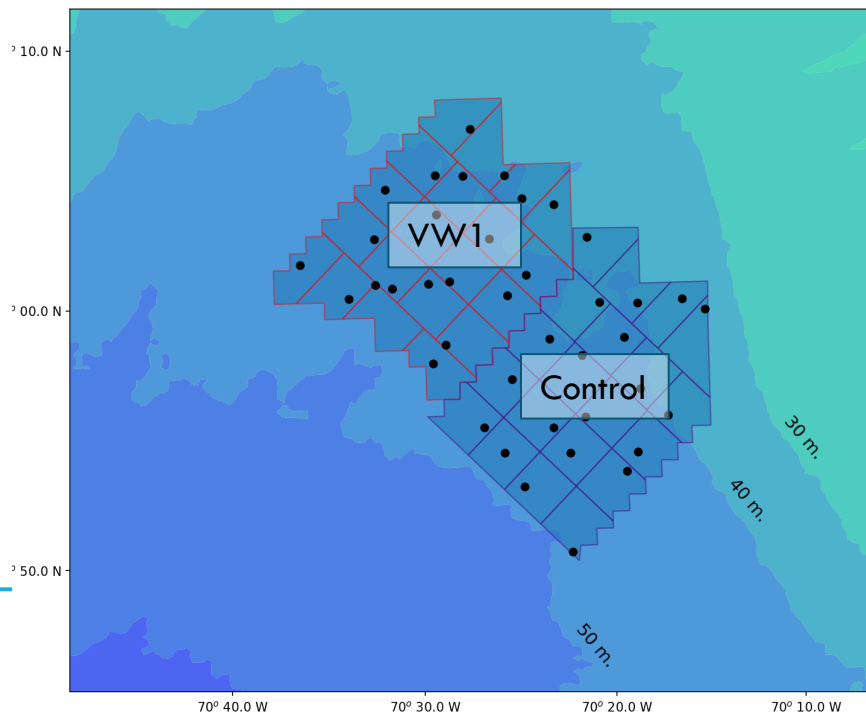
- Winter: January – March
- Spring: April – June
- Summer: July – September
- Fall: October – December

## Number of tows

- 20 tows each in VW1 Study Area and Control Area.

## Data Collected

- Trawl Performance
  - Doorspread, wingspread and headrope height
- Catch
  - Aggregated species catch
  - Individual lengths and weights
- Environmental
  - Sea state, wind speed and wind direction
  - CTD cast and bottom water temperature



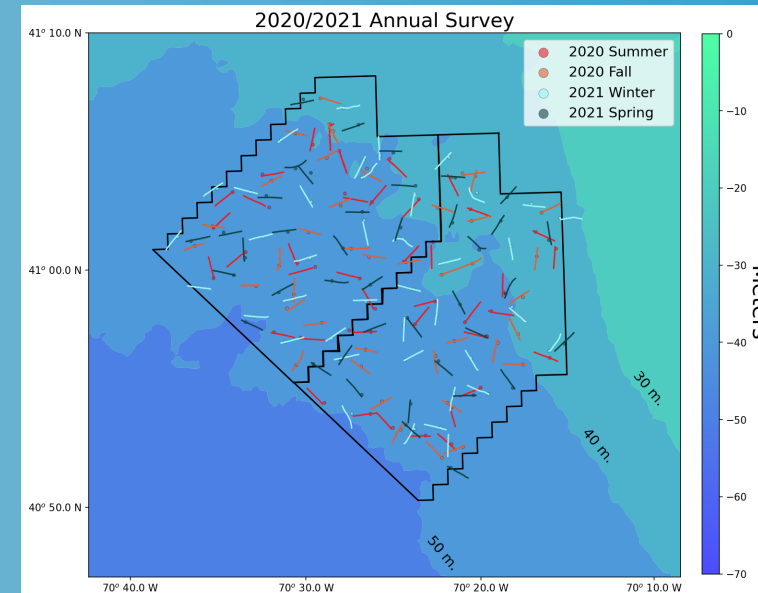
# 2019 – 2022 SURVEY DATA

## Pre-construction surveys and tows:

- 11 seasonal surveys completed (June 2019 – August 2022)
- 3 Fishing vessels used for the surveys
  - F/V Heather Lynn – 9 surveys
  - F/V Guardian – 1 Survey
  - F/V Endurance – 1 Survey
- 440 tows

## Species and measurements:

- 50 species
  - Small: Juv. Silver Hake, Squid, Scup
  - Large: Summer Flounder, Rough tail Skate, Thresher Shark
- Top 10 Abundant Species
  - 93 – 97% total biomass





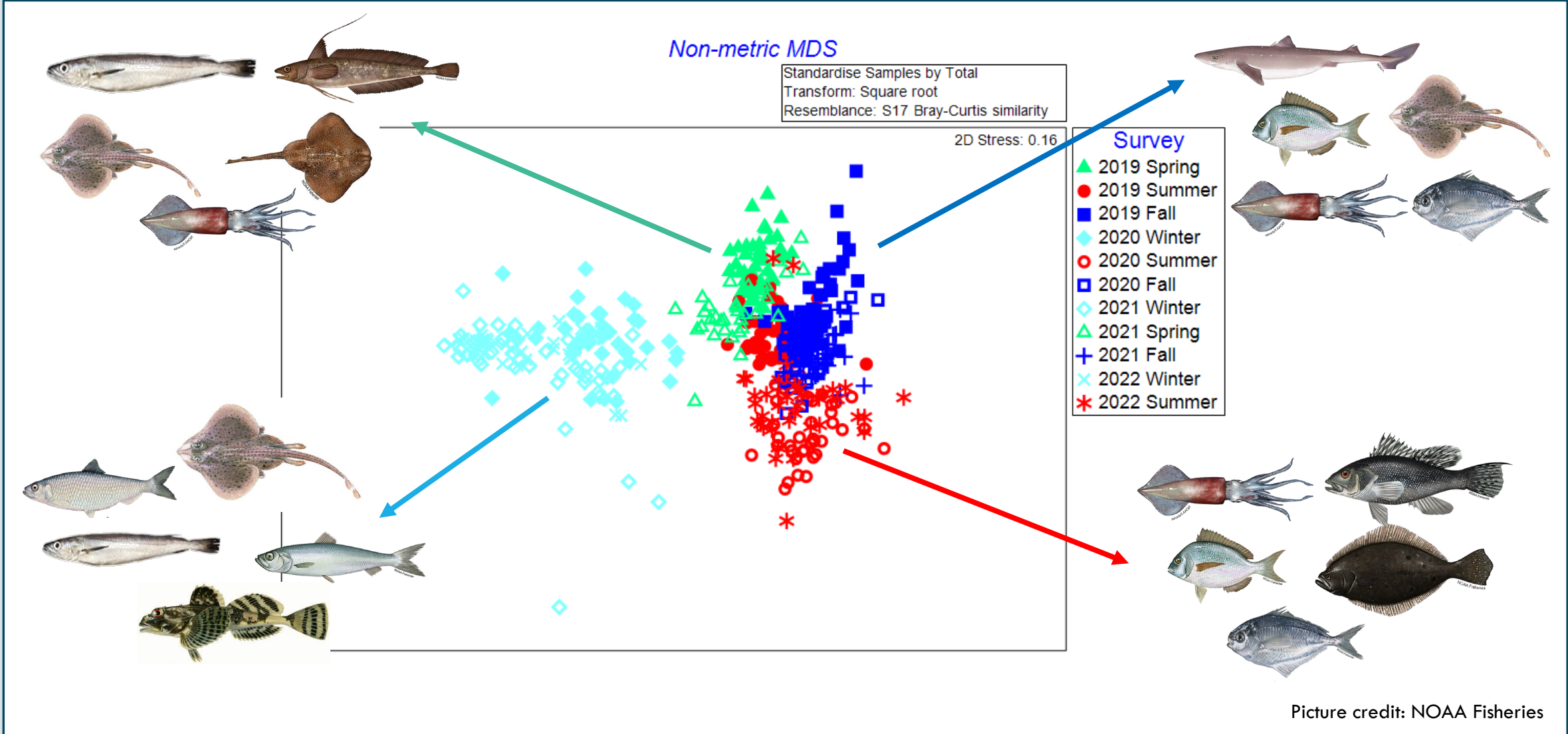
# CATCH COMPOSITION – VINEYARD WIND 1

Species Name	Scientific Name	Total Weight (Kg)	% Tows with Species Present
Dogfish, Spiny	<i>Squalus acanthias</i>	38258.3	50.2
Skate, Little	<i>Leucoraja erinacea</i>	29417.0	97.0
Scup	<i>Stenotomus chrysops</i>	20051.6	53.9
Butterfish	<i>Peprilus triacanthus</i>	15183.3	76.6
Hake, Silver	<i>Merluccius bilinearis</i>	15226.6	90.7
Hake, Red	<i>Urophycis chuss</i>	14820.0	72.5
Skate, Winter	<i>Leucoraja ocellata</i>	7100.7	50.0
Herring, Atlantic	<i>Clupea harengus</i>	4824.2	37.3
Squid, Atlantic Longfin	<i>Doryteuthis pealei</i>	2901.3	72.3
Haddock	<i>Melanogrammus aeglefinus</i>	2122.2	4.1
Alewife	<i>Alosa pseudoharengus</i>	2070.8	52.5
Sea Robin, Northern	<i>Prionotus carolinus</i>	1483.0	45.2
Monkfish	<i>Lophius americanus</i>	1116.6	33.0
Skate, Barndoor	<i>Dipturus laevis</i>	1096.9	37.0
Dogfish, Smooth	<i>Mustelus canis</i>	860.8	18.2
Flounder, Summer (Fluke)	<i>Paralichthys dentatus</i>	815.9	45.2
Flounder, Fourspot	<i>Paralichthys oblongus</i>	778.0	69.3
Flounder, Windowpane	<i>Scophtalmus aquosus</i>	544.8	57.7
Flounder, Winter	<i>Pleuronectes americanus</i>	368.9	45.0
Crab, Cancer	<i>Cancer irroratus</i>	336.7	52.0

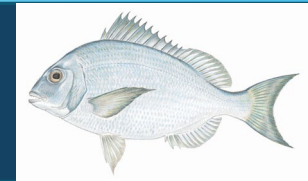




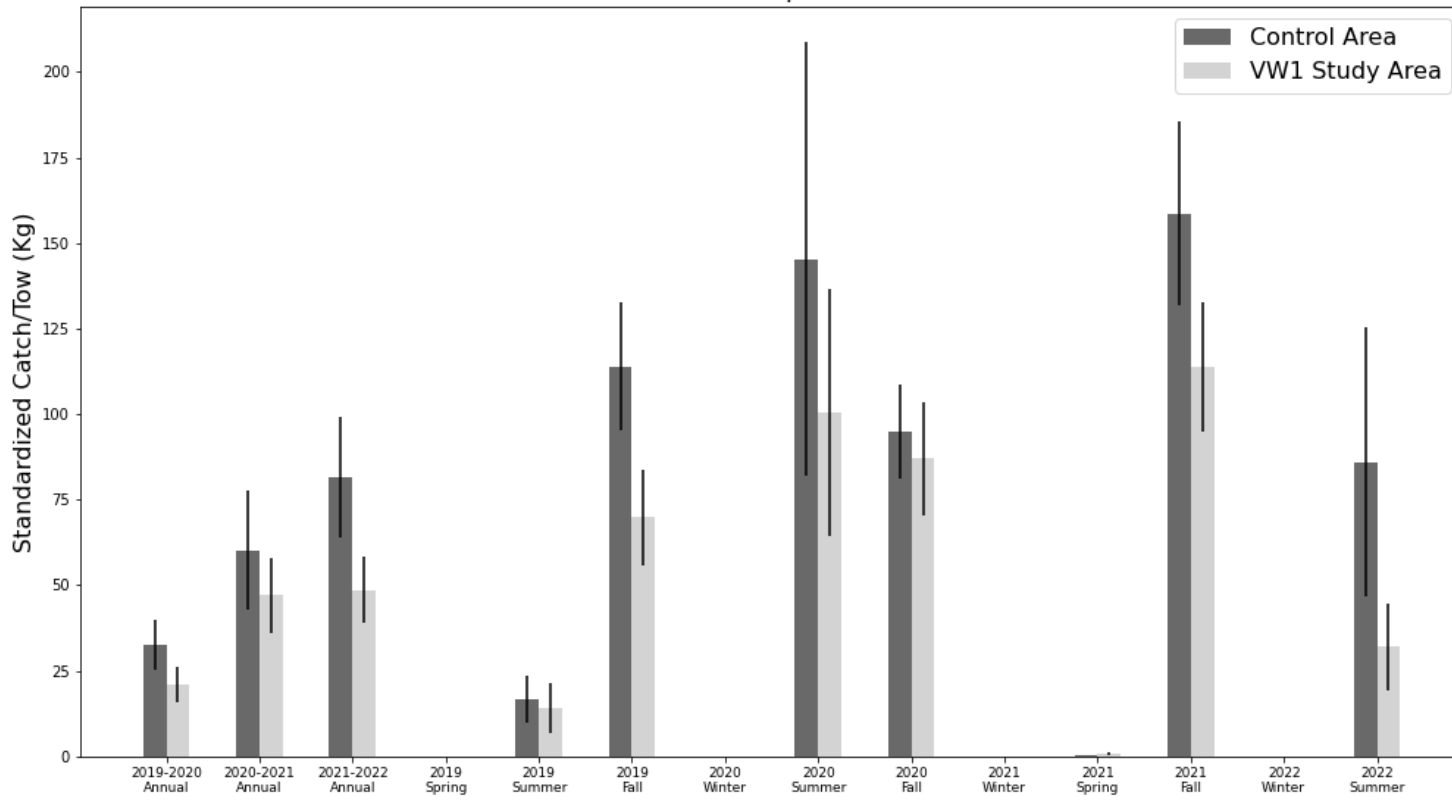
# COMMUNITY COMPOSITION ANALYSIS



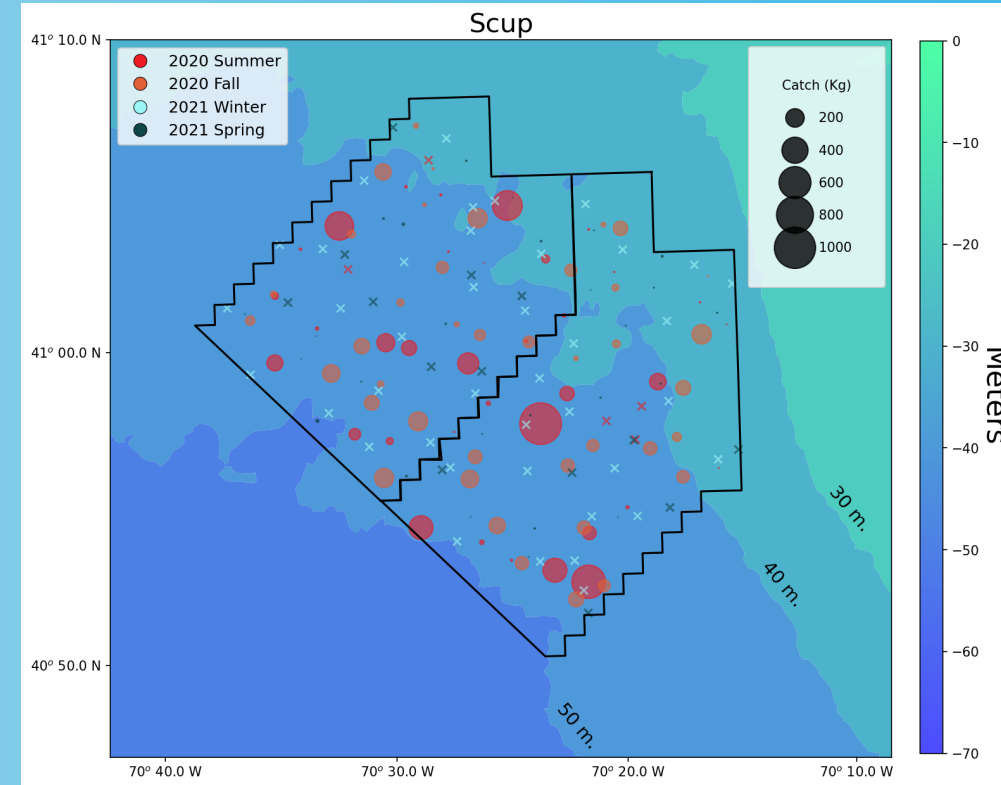
# EXAMPLE – SCUP (*Stenotomus chrysops*)



Scup



Scup





# SUMMARY

- The Vineyard Wind 1 offshore wind energy area is a highly dynamic system exhibiting seasonal and annual variability in community composition, species abundances and population structure.
  - High levels of variability in most commercial species mean that moderate changes (30-50%) will be required ensure high probability of detection.
  - High levels of transience observed may be beneficial for temporary disturbance due to construction activities.
- NEAMAP survey protocols and gear were well suited and useful for monitoring a wide range of species in the area.
  - Involving commercial fishermen in the project yielded significant improvements due to their insight with the survey gear and knowledge of the local species.
  - Their witness and involvement in the data collection lent credibility within the industry.
  - During-construction monitoring has allowed fishing vessels to work in and around operating turbines.



# ACKNOWLEDGEMENTS

## Industry Partners

F/V Heather Lynn:

Steve Follett

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Mike Gallagher

Kevin Jones

Matt Manchester

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Scott Riley

Ryan Roache

Andrew Follett

Barry Klapp

F/V Guardian:

Mike Walsh

Bill Walsh

Adam Walsh

Kirk Walters

Raphael Felix

Bob Felix

F/V Endurance:

Armando Estudante

Virgilio Martins

Antonio Lamiero

Reidar's Manufacturing

Tor Bendiksen

Hans Bendiksen

A.I.S.

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MORE INFORMATION  
CAN BE FOUND AT:

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