Spatial and Energetic Processes of Black Sea Bass in Southern New England

Andie Painten and Dr. Kevin Stokesbury

UMass Dartmouth – School for Marine Science and Technology

apainten@umassd.edu

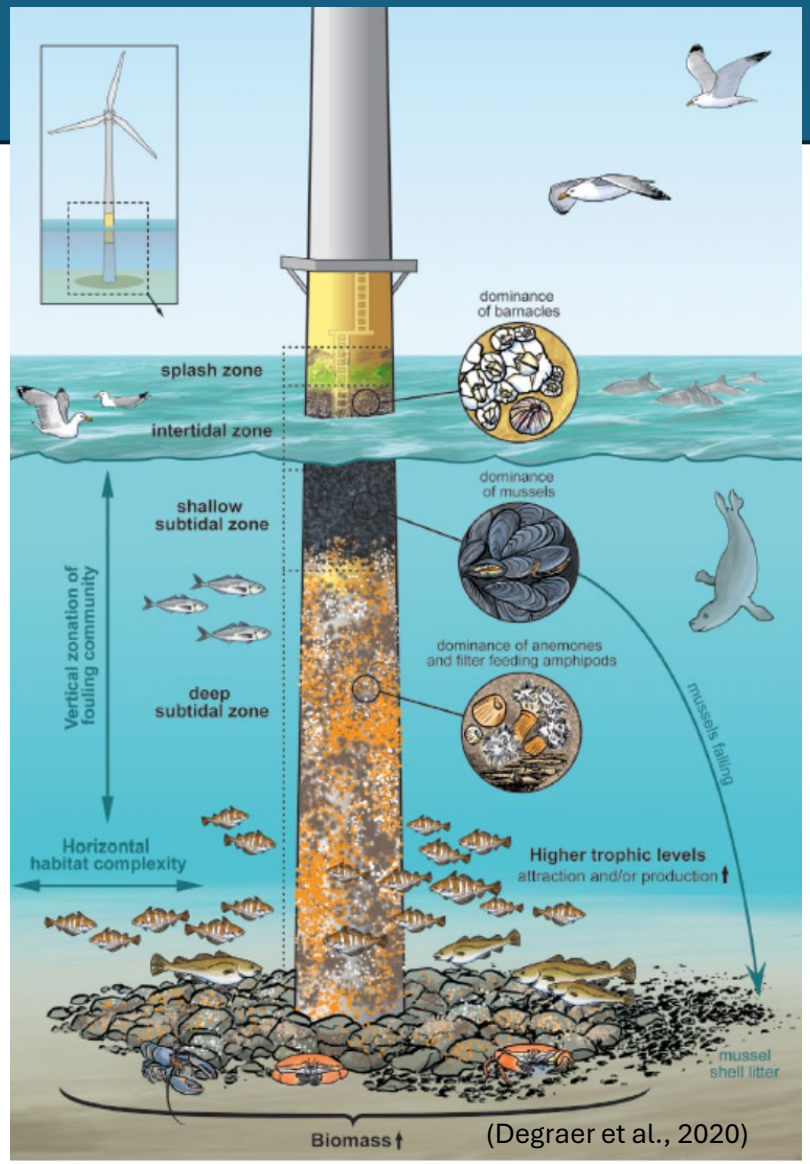
School for Marine Science & Technology
UMass Dartmouth

Background

- Black sea bass migrate inshore in spring, and offshore and southerly in the fall
- Species of concern include structure-oriented fish as these structures can affect their spatial distributions
- Seabed in southern New England wind lease areas is mostly sand
- Most leases areas are in pre-construction phases
- There may be species specific responses to development based on unique life history traits

Artificial Reef Effect

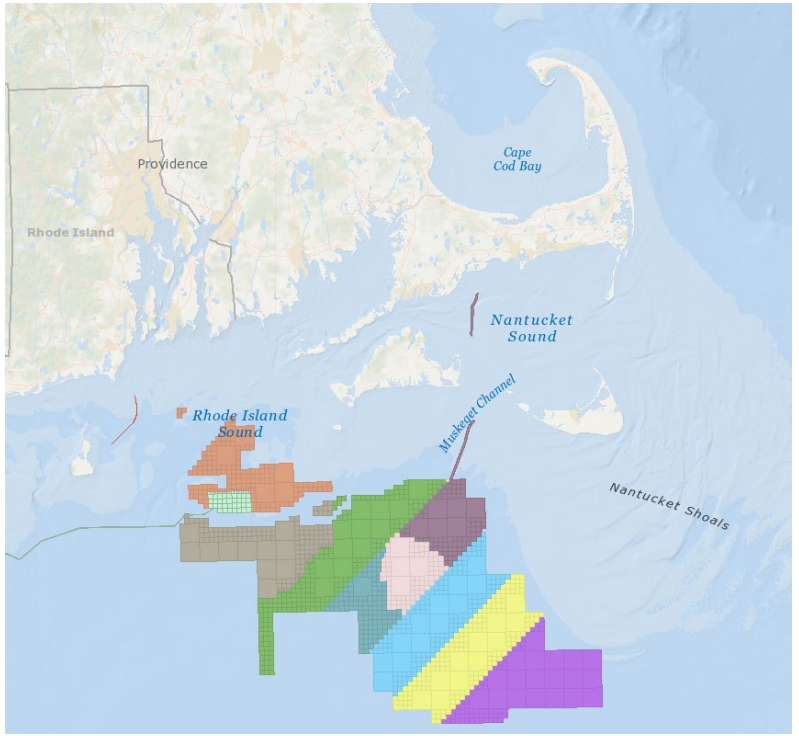
Will offshore wind farms attract black sea bass to aggregate or provide the habitat to increase their abundance?



(Degraer et al., 2020)

Objectives

- Do all life history stages of black sea bass use offshore wind farm areas before construction as habitat?
- Can offshore wind structures create suitable habitat for each life history stage?
- Are black sea bass spawning in these areas now?

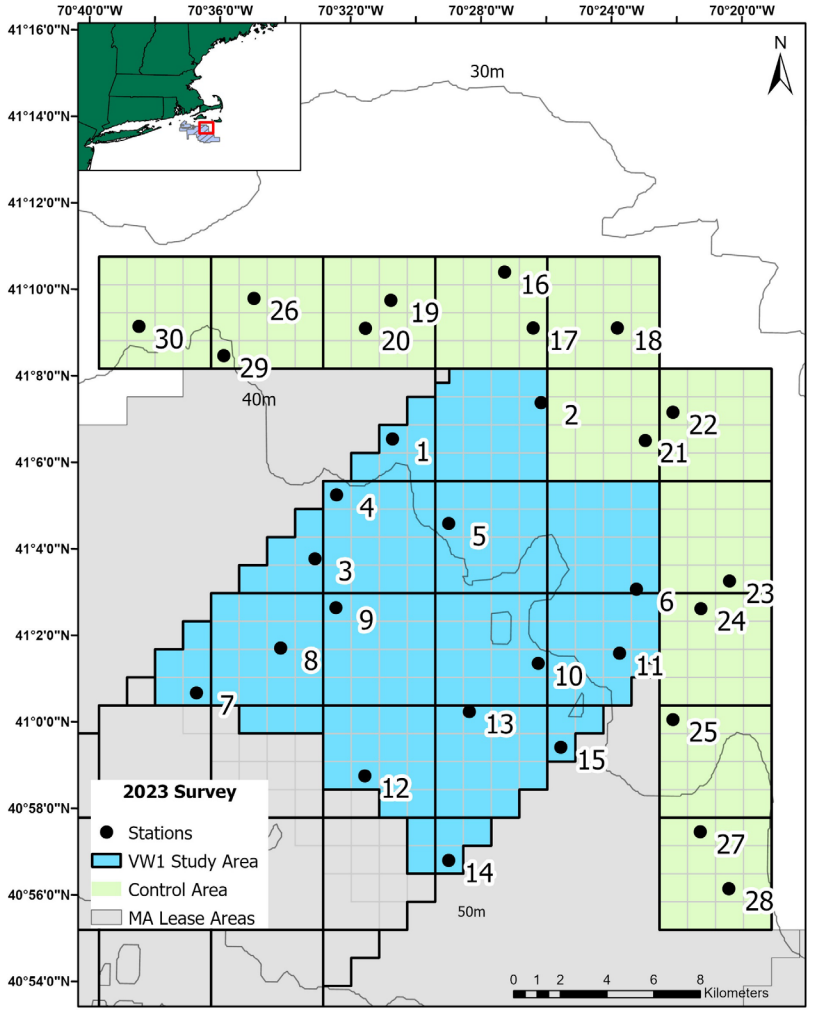


A map of the offshore wind lease areas in Southern New England.

Methods

Are the fisheries monitoring surveys capturing black sea bass? If so, which stages?

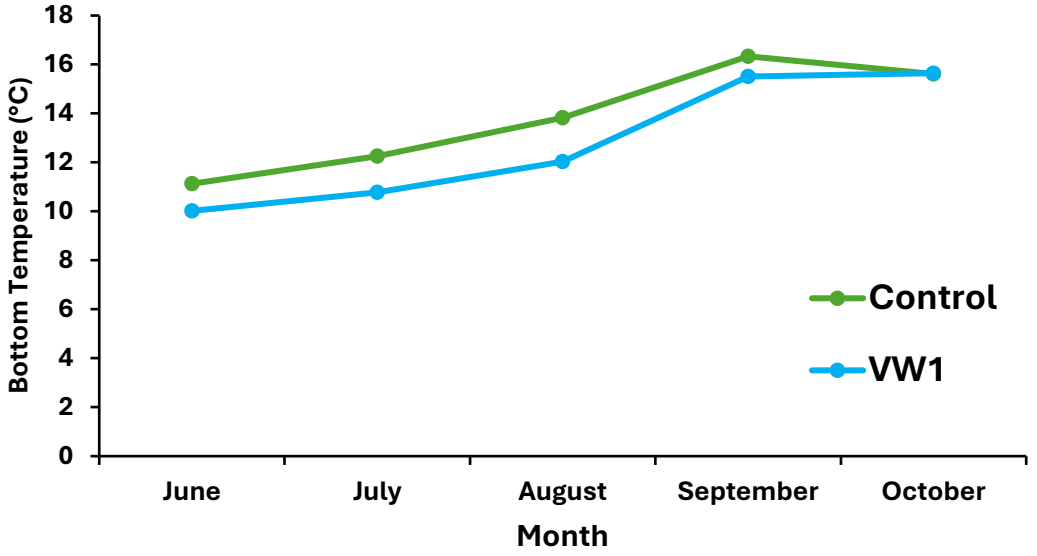
- Characterize the habitat
- Synthesize available data from 2019-2023:
  - Drop camera (2x/year, 240 stations)
  - Bottom trawl (4x/year, 40 stations)
  - Trap surveys (May – October, 30 stations)
- Biological sampling
  - 1,246 caught in in pots over three years
  - 1,008 caught in trawl survey over three years
  - 416 fish dissected in three years of sampling



Substrate and Temperature

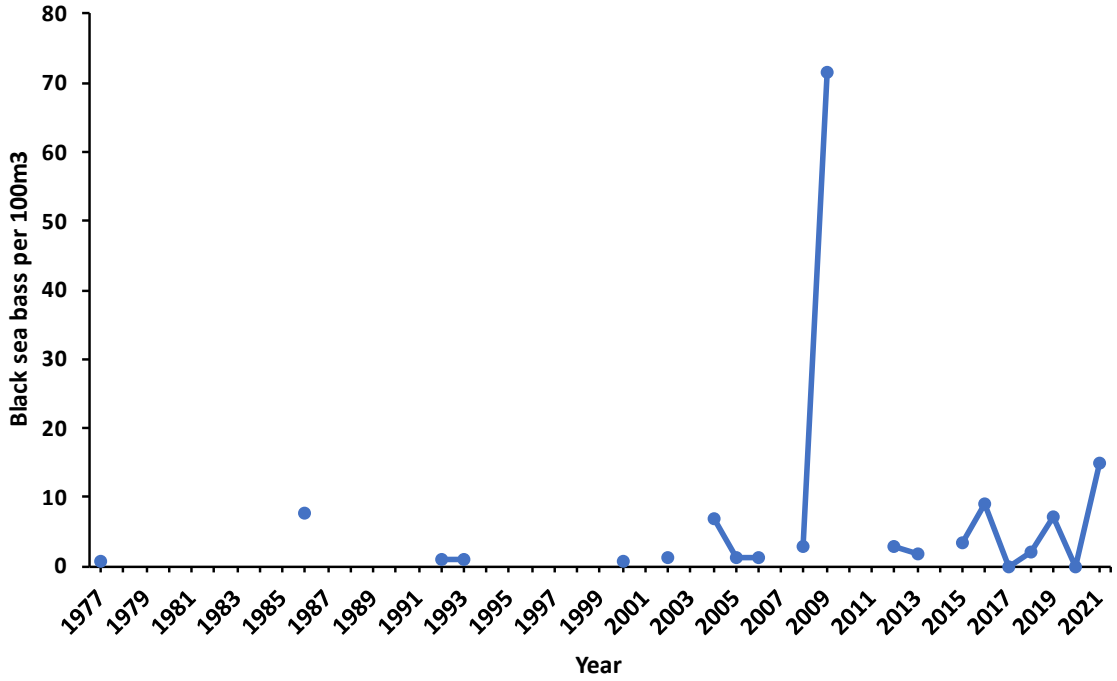
- Bottom type is predominantly sand with patches of gravel (Stokesbury et al. 2024)
- Sand dollars, waved whelks, hermit crabs, and skate, are commonly found species in the areas (Lego et al. 2023)
- Warmer temperature in Control area on average
- Energetically unfavorable to live in spring and winter temperatures (Zavell et al. 2024)

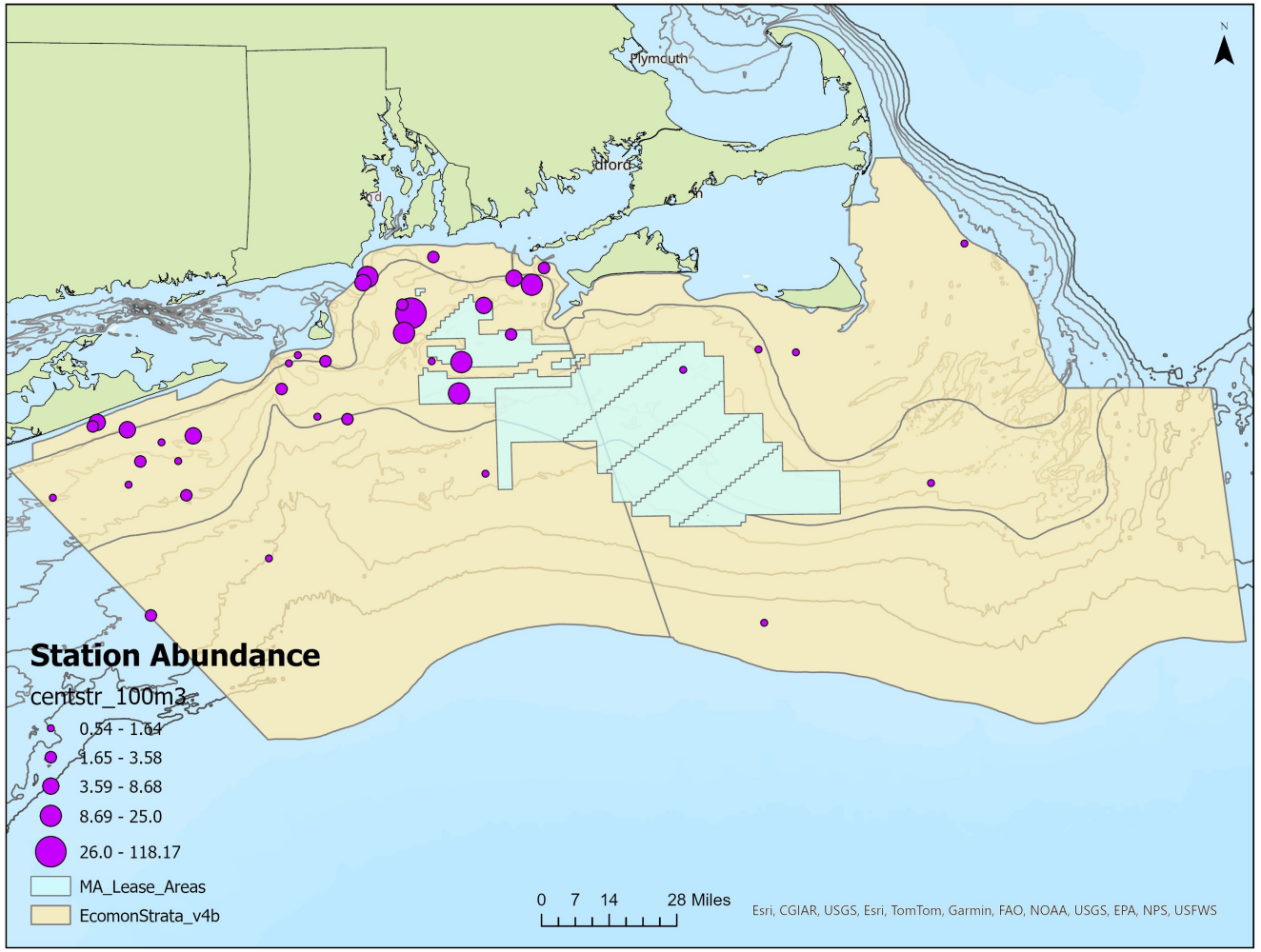
Drop camera image of seafloor in Study Area



Larvae

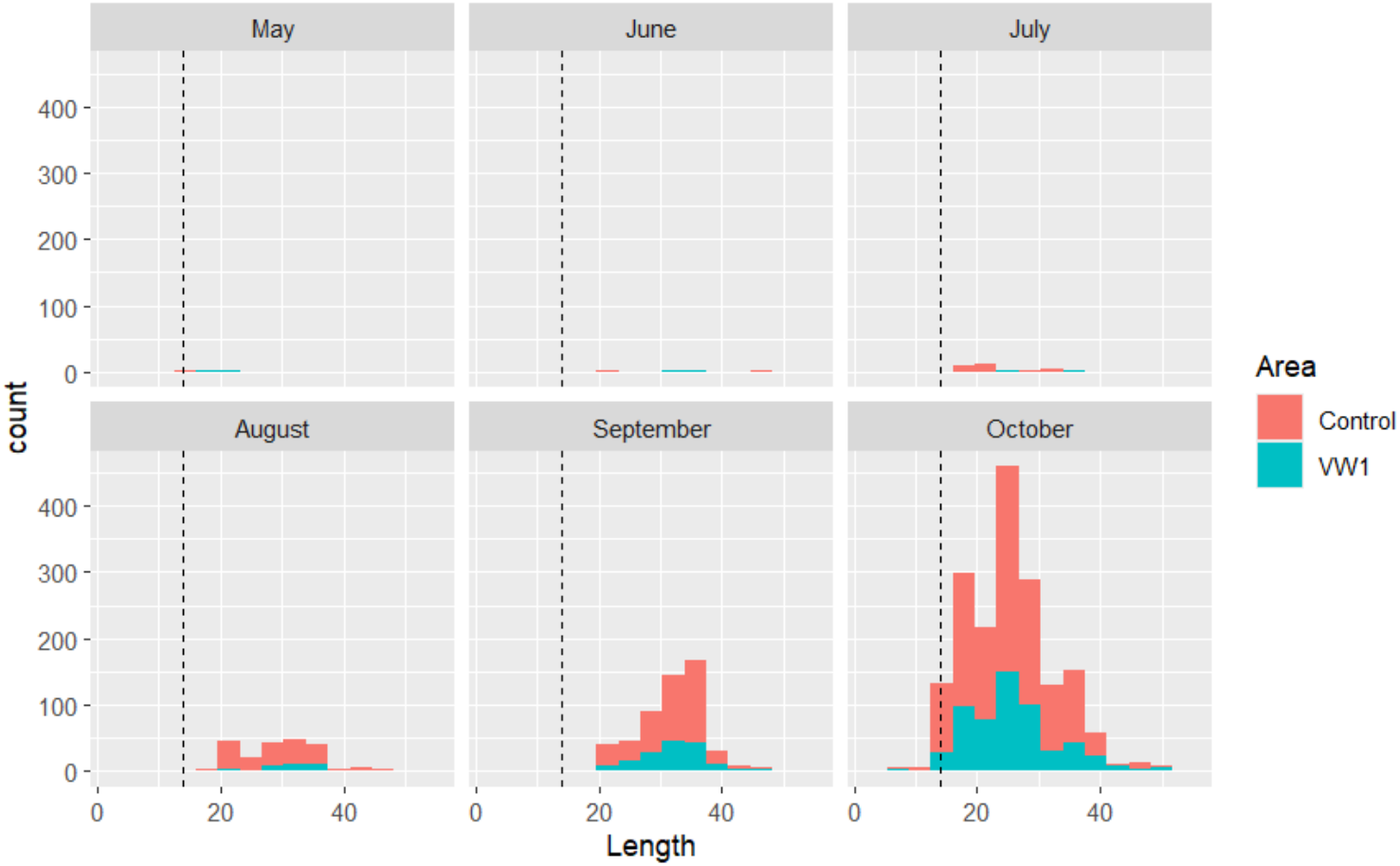
- Higher abundances inshore closer to spawning sites
- Limited sample coverage





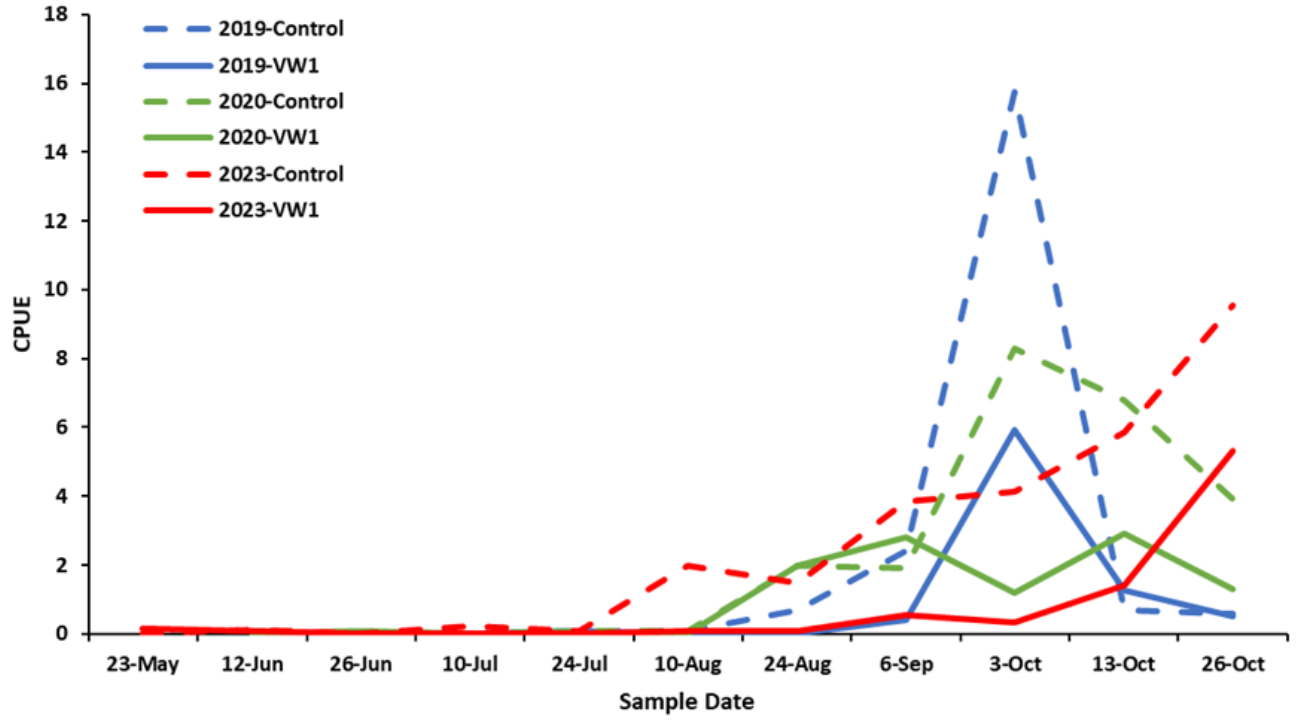
Juveniles

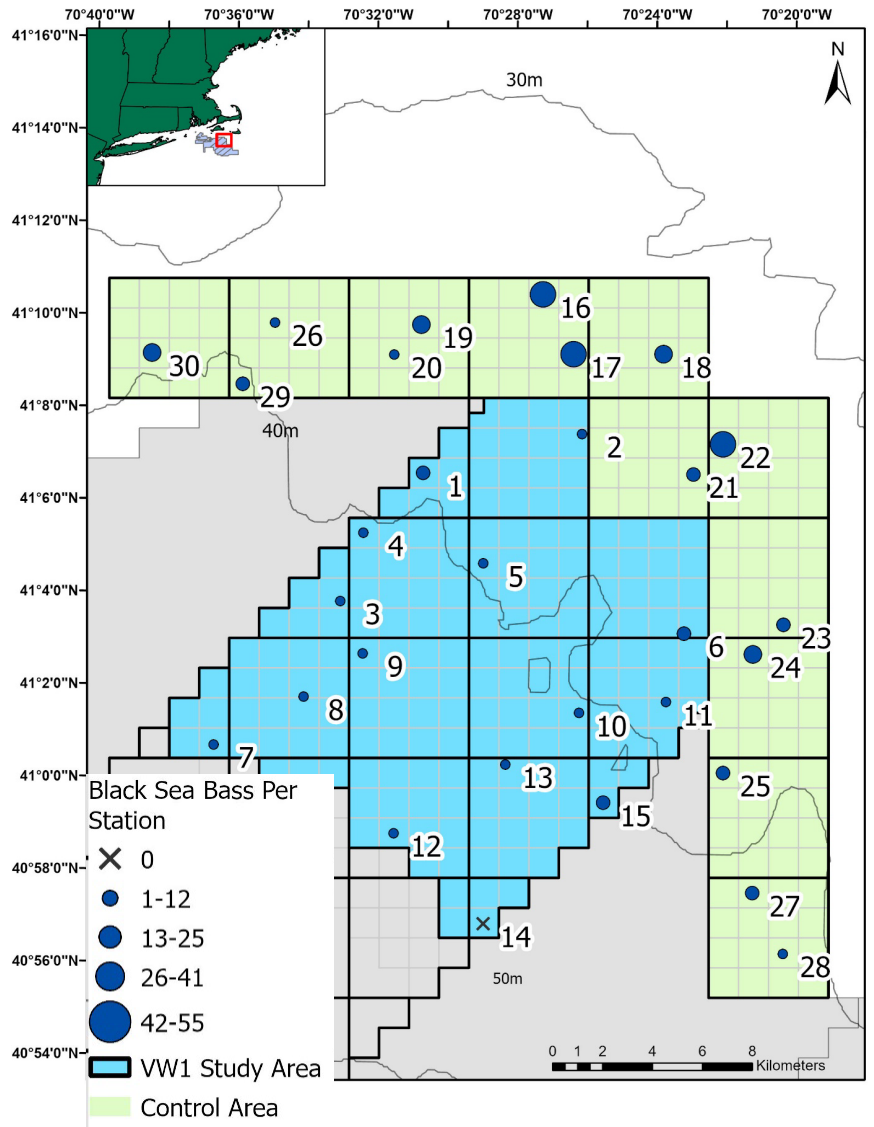
- Are juveniles well sampled?
  - In trawl net and minnow traps
- Observed in survey in fall, rarely in spring
- Prefer inshore estuarine habitat
- Spread widely across the shelf to overwinter (Miller et al 2016)



Adults

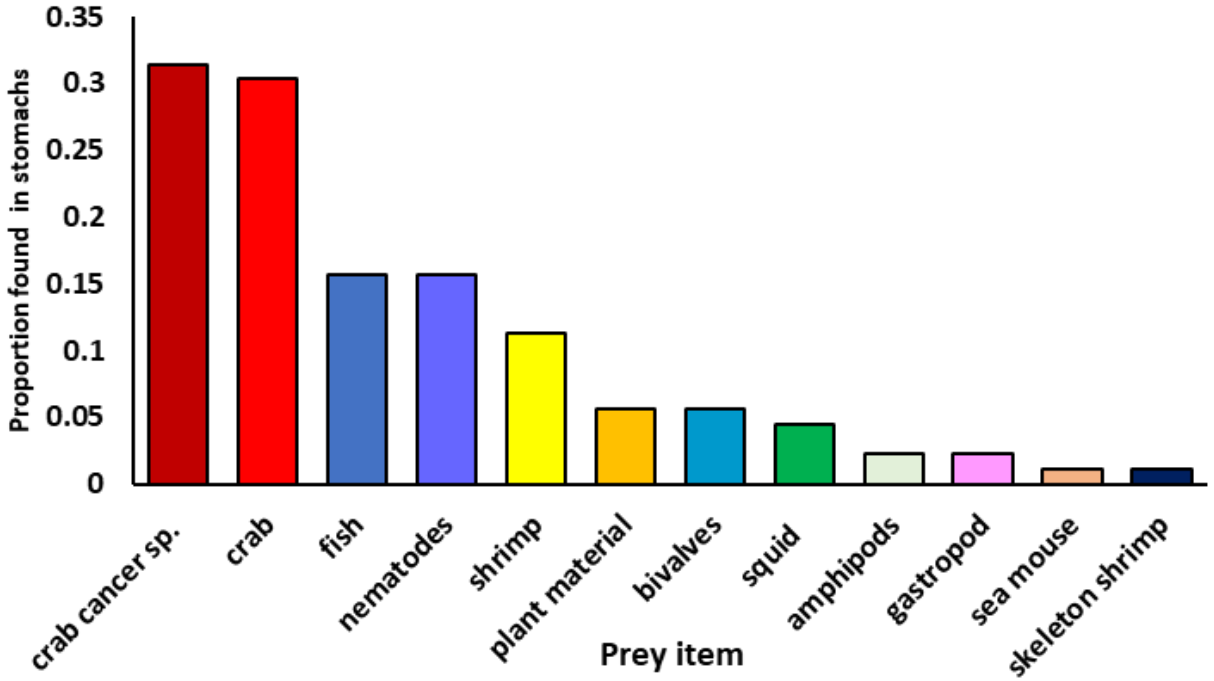
- CPUE in control area consistently greater than study area
- Catch reflects trend in stock abundance
- Rarely caught in winter





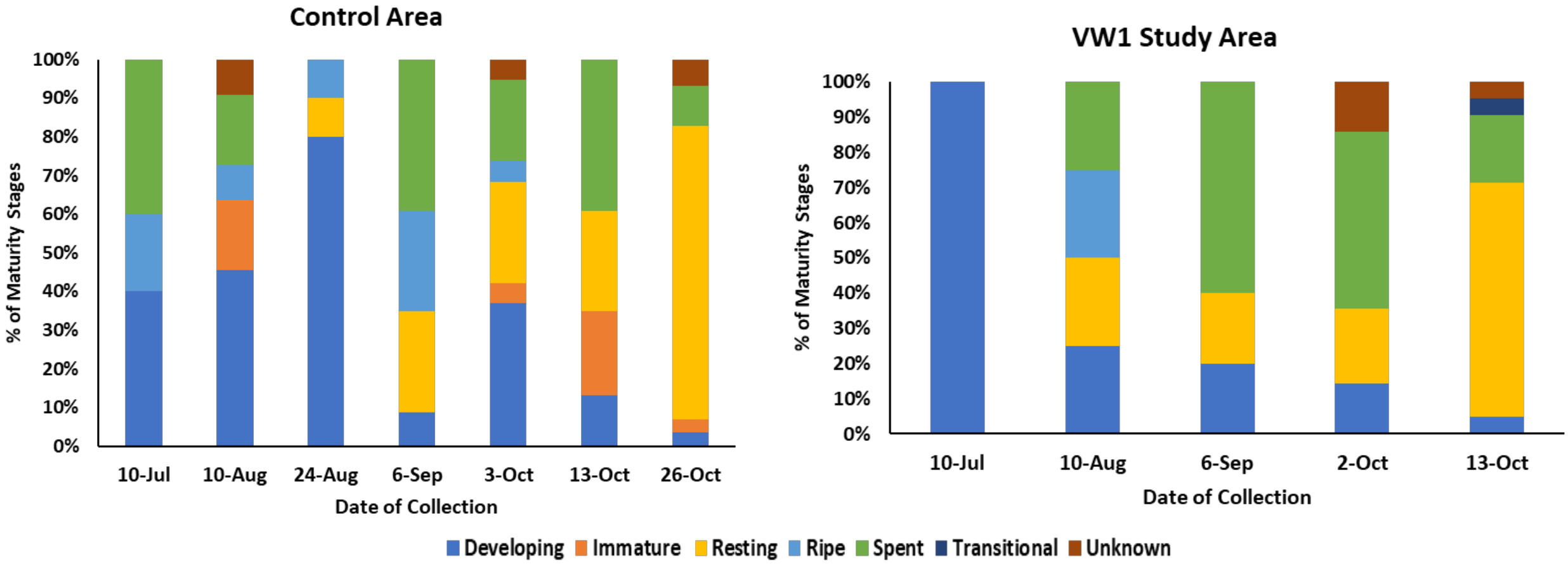
Diet

- 416 fish dissected for stomach contents
- 68% and 67% had food in Control and VW1 Area, respectively
- Diet between Control and VW1 Area had similar compositions
- Crabs and fish most abundant prey items



Spawning

- Spent and resting were most frequent maturity stages, ripe individuals were rare



Will offshore wind areas support each life history stage?

Attraction

- Structured habitat suitable for spawning
- Unknown effects on egg dispersal
- Habitat for juveniles
  - Prefer inshore estuarine
- Artificial reef effect will support diet
- Suitable temperatures in spring and fall

Production

- Unknown effects on egg dispersal
- Unknown effects on larval settlement
- Habitat for juveniles
  - Prefer inshore estuarine
- Increase in predators – natural and fishing pressure
- Unfavorable temperatures in summer and winter

Thank you for listening!

Questions?

Andie Painten
University of Massachusetts Dartmouth – SMAST
apainten@umassd.edu

Acknowledgements:

VINEYARD WIND

SMAST