

Assessing the blue crab (*Callinectes sapidus*) population in Rhode Island state waters

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Presentation overview



Species and fishery



Objective and Justification of Study



Approach

1. Overview of existing datasets
2. Winter dredge survey

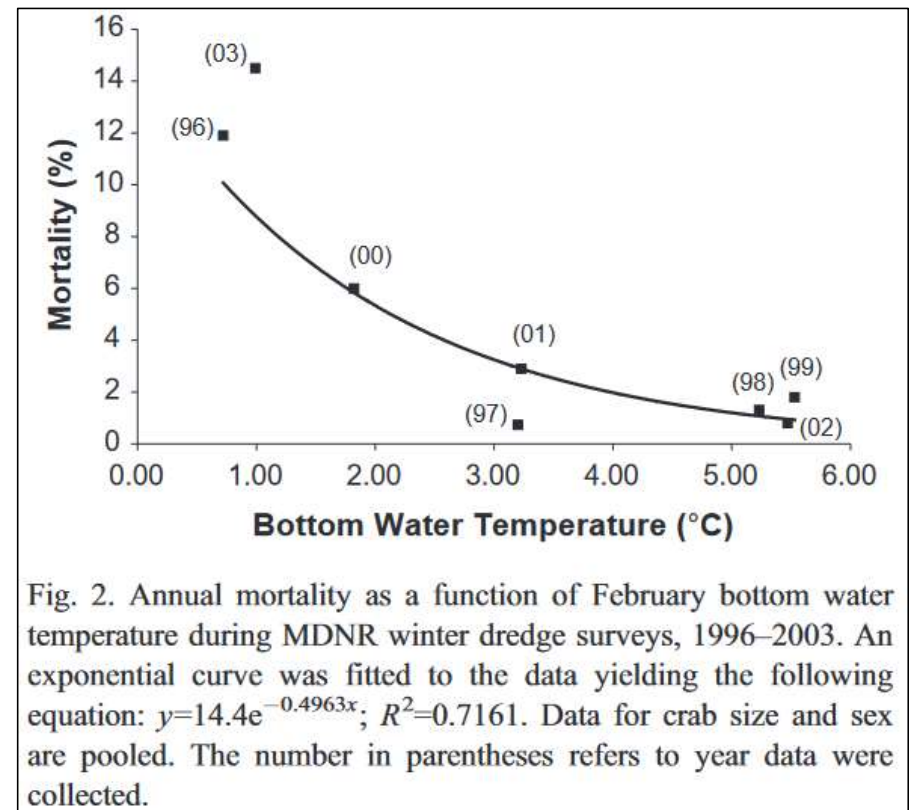


Questions

Blue crab *Callinectes sapidus*



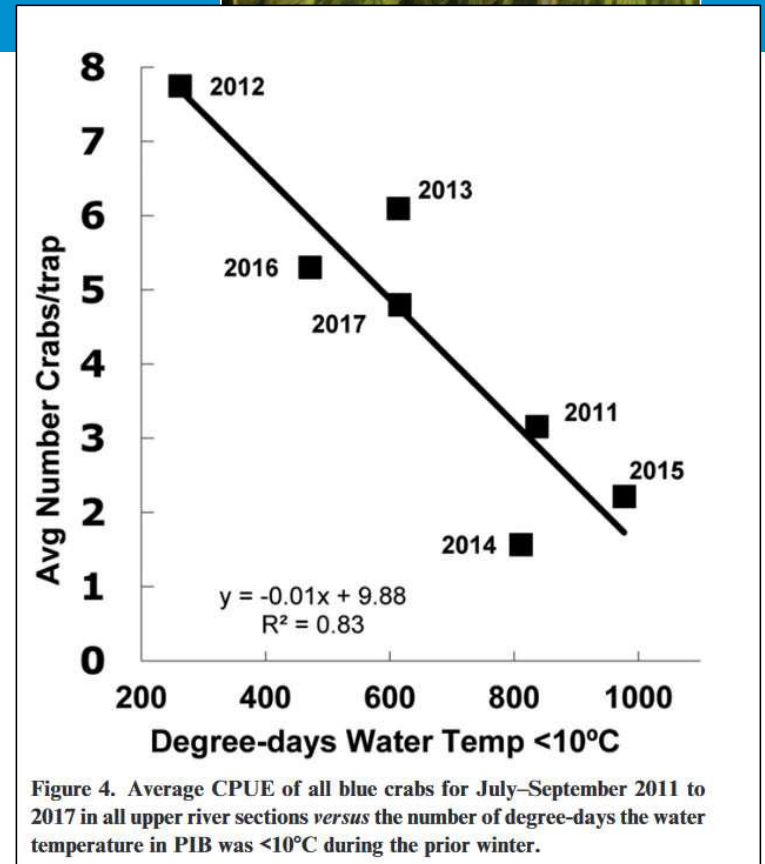
- Portunid swimming crab
- Commercial and recreational fisheries
- Major predator in benthic communities
- Lower winter temps = higher mortality
 - Interannual variability



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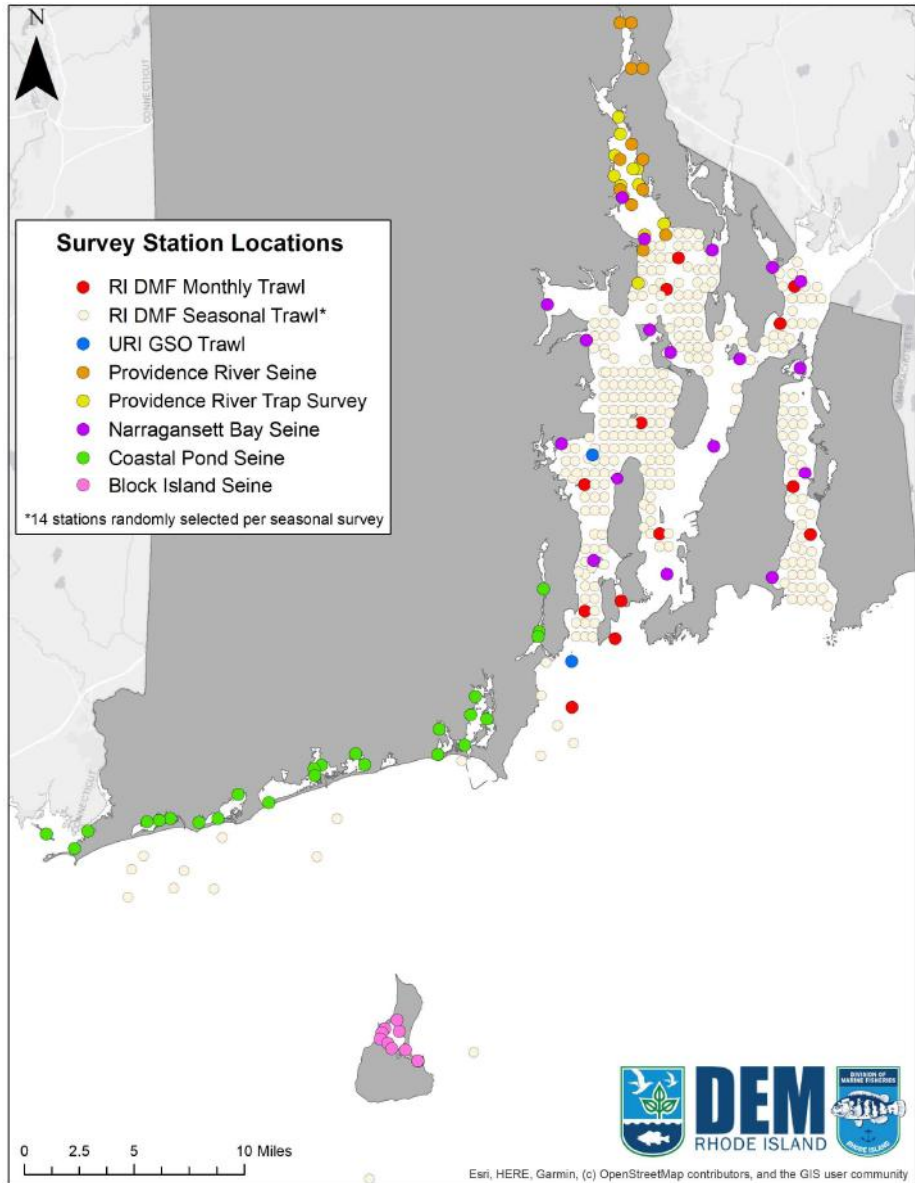


Objective: Assess the blue crab population in RI ahead of a potential emerging fishery

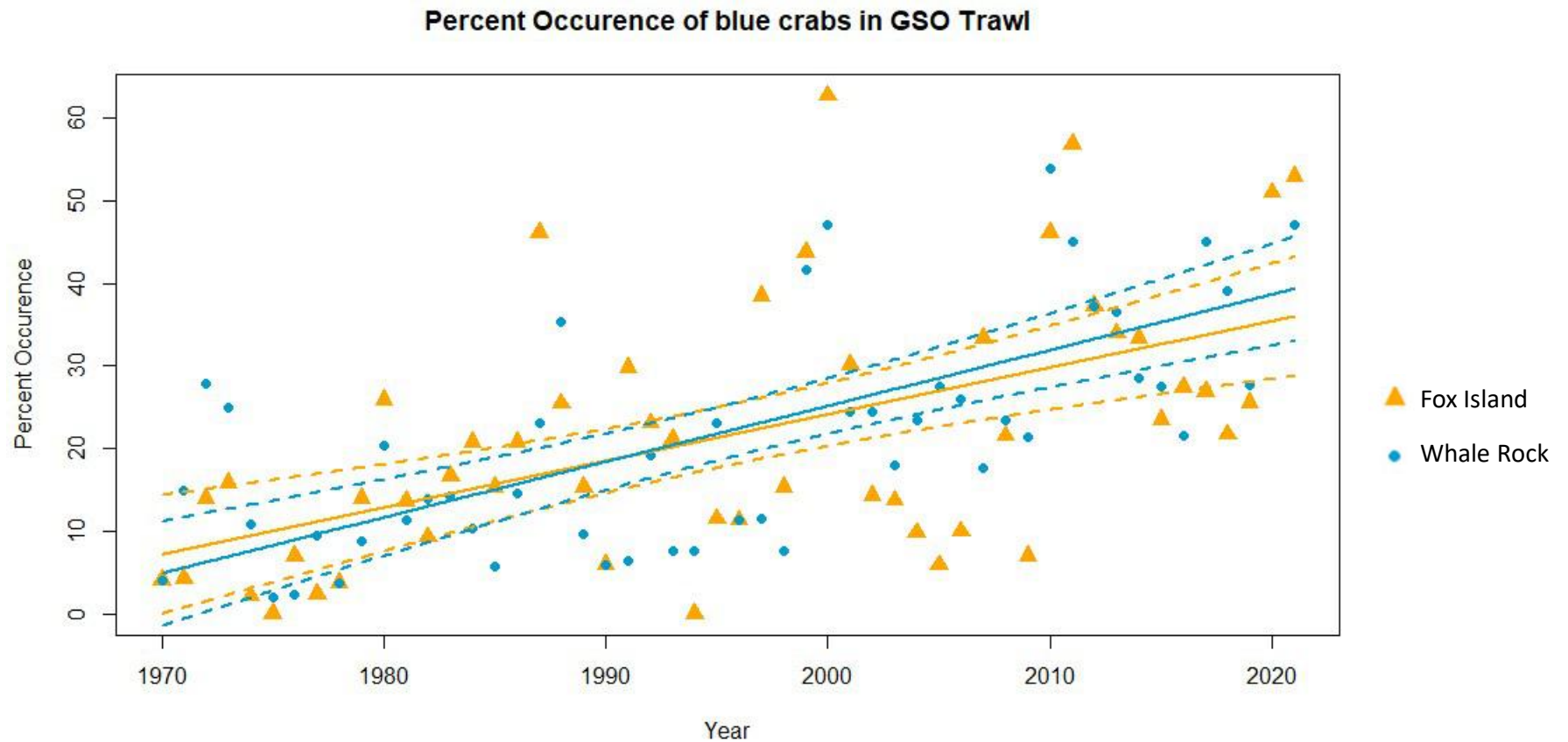
- No comprehensive assessment in RI across state waters
- Interest in expanded (commercial) fishery in RI
 - assessment and monitoring needed to inform management
- Evidence of range expansion/population increase
 - Chesapeake: up to 20% increase in survival by 2100 (Glandon et al. 2019)
 - Increase in observations in GOM and evidence of recruitment (Johnson 2015)
- Climate change = increased abundance in RI?
 - Narragansett Bay is warming
 - Shifts in distribution documented for other species

Two-pronged approach

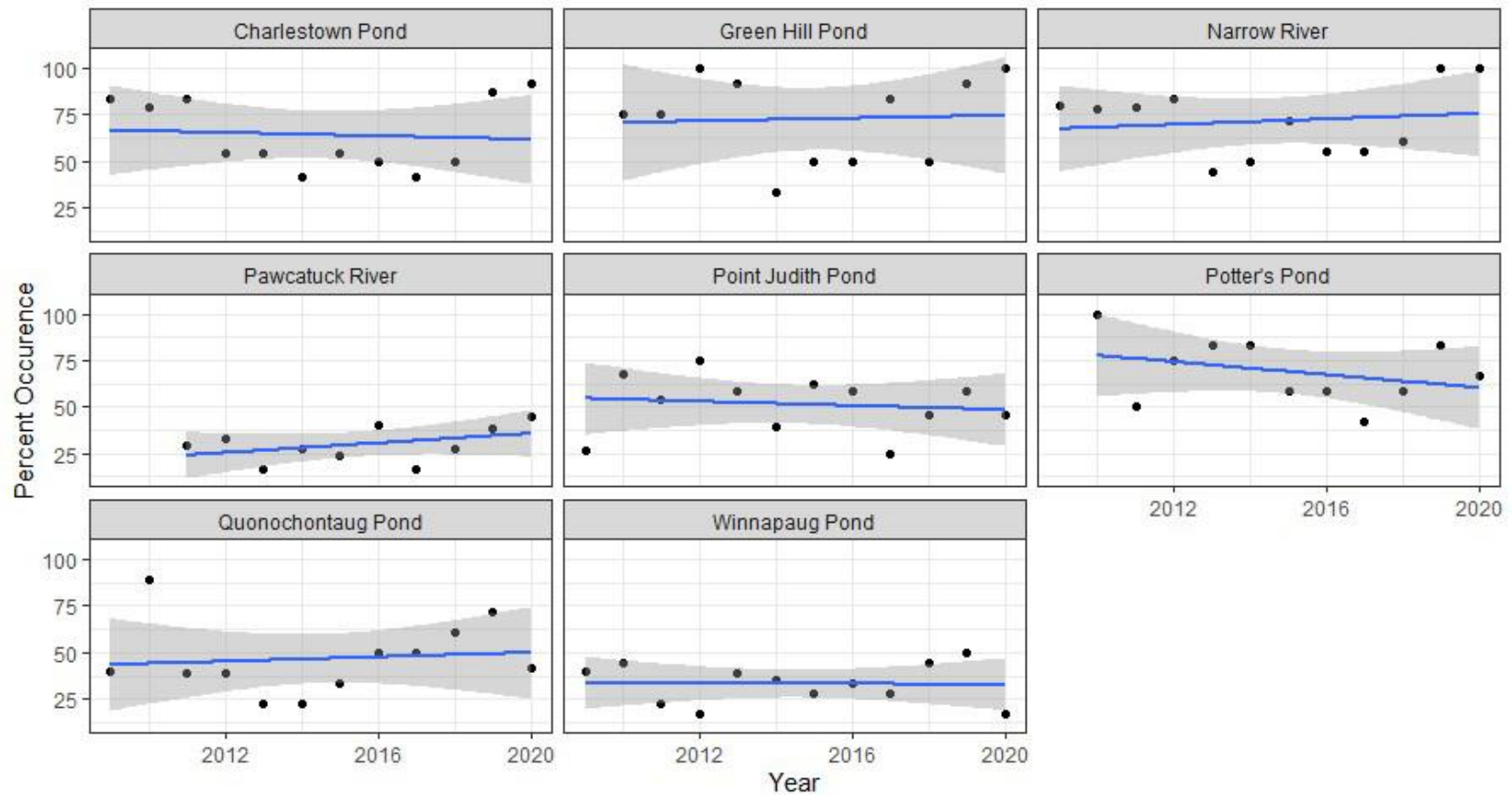
1. Analysis of blue crab data from various RI DEM/URI/TNC monitoring surveys
2. Establishment of an annual winter dredge survey



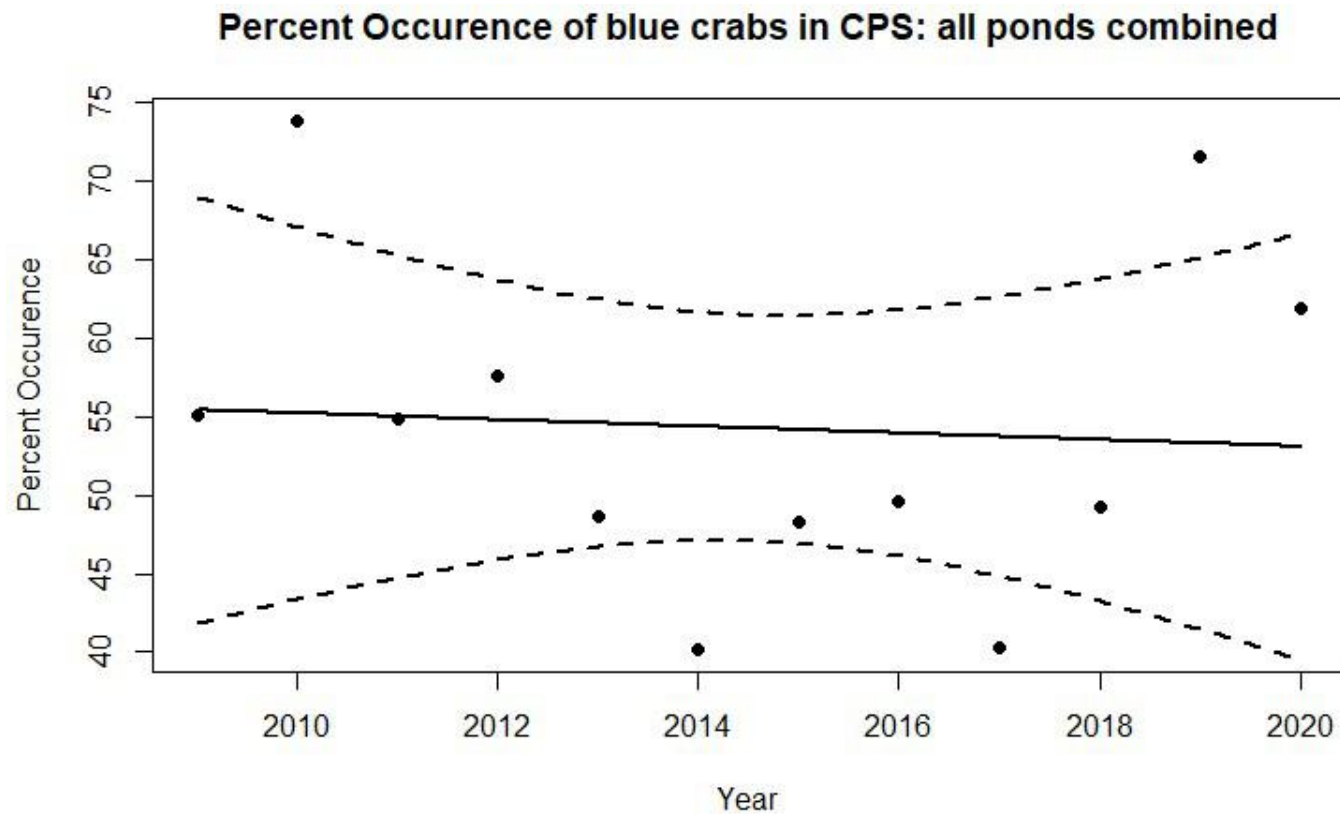
Part 1 Preliminary Analysis: GSO Trawl



Part 1 Preliminary Analysis: Coastal Ponds



Part 1 Preliminary Analysis: Coastal Ponds

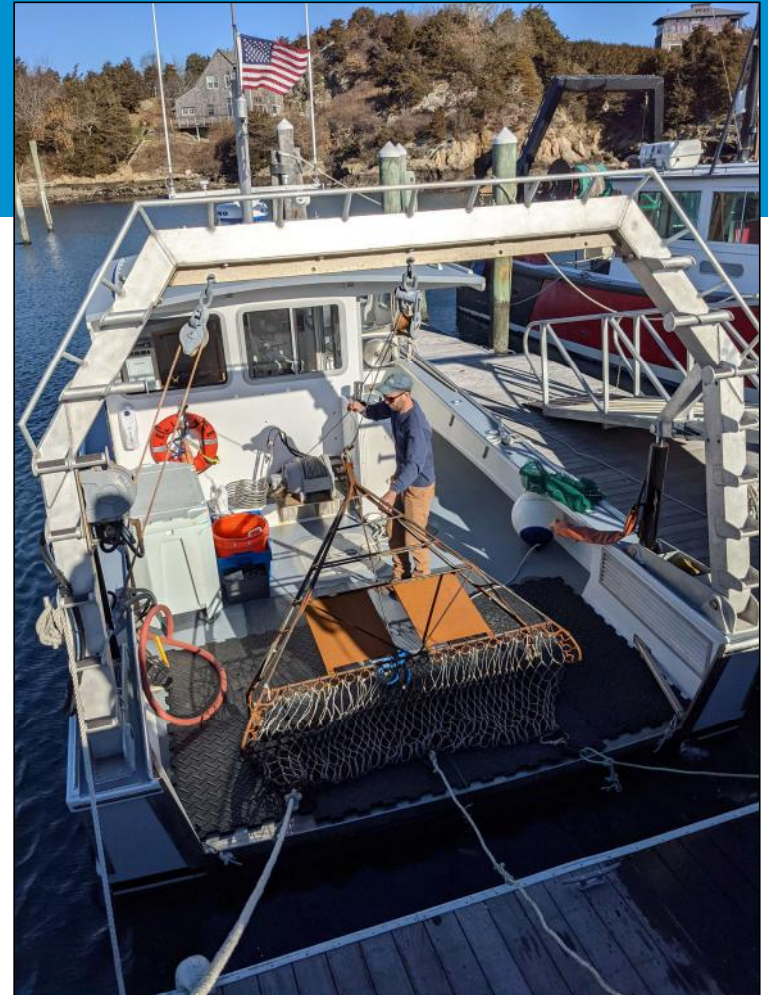


Part 1: Next steps

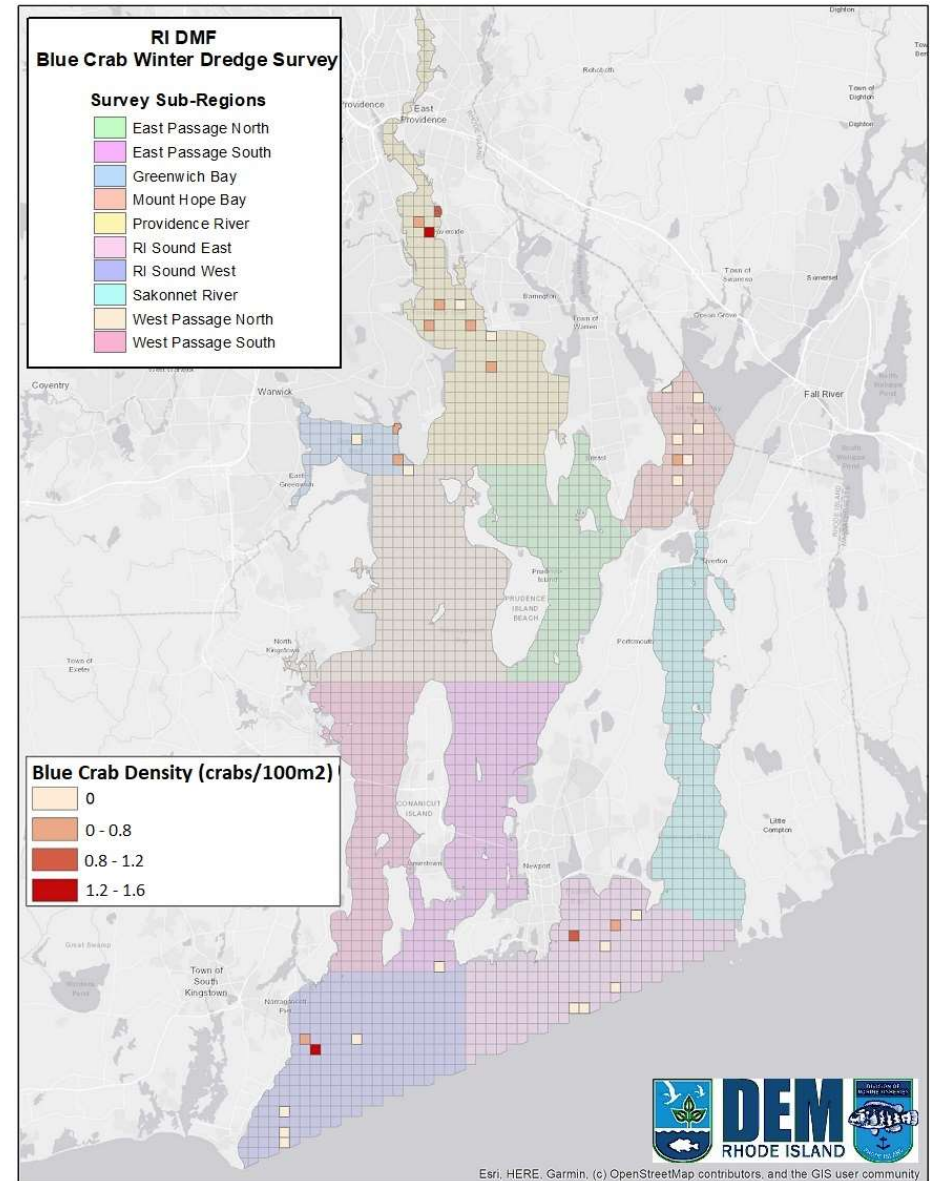
- Continue to investigate spatial and temporal differences in population
 - Abiotic conditions (region, habitat/sediment type, temp, sal, depth)
- Hierarchical analysis to combine into single index (Conn 2010)
- Size-based catch curves
- Assess seasonal growth, movement patterns, recruitment, how size limit regulations relate to population size structure
- Sex ratio/egg production to estimate SSB
- Seasonality of molting

Part 2 - Winter dredge survey

- Based on Chesapeake Bay methodology
- Stratified-random sampling
 - Strata = region/waterbody
- December – March
- Narragansett Bay and RI Sound



- Piloted in winter 2021-2022
- Blue crabs caught in Providence River, Greenwich Bay, RI Sound West, RI Sound East
 - 39 tows completed
 - Maximum density 1 crab per 62 m²
 - Highest densities in Providence River and off Bonnet Shores
- Spatially segregated by sex
 - Males/juveniles in upper bay
 - Females in lower bay



Part 2: Next steps

- Continue winter dredge survey
- Increase sampling intensity (goal of 80 tows/season)
- Determine efficacy of survey as long-term monitoring tool

Thank you!

- Dr. Conor McManus, Pat Brown, Chris Parkins, Sean Fitzgerald, John Lake, Scott Olszewski, Corinne Truesdale, Rich Balouskus, many more (RIDEM DMF)
- Dr. Austin Humphries, Dr. Candace Oviatt (URI)
- USFWS State Wildlife Grant

