

Fish and Fisheries of Narragansett Bay: Where We've Been and Where We're Headed

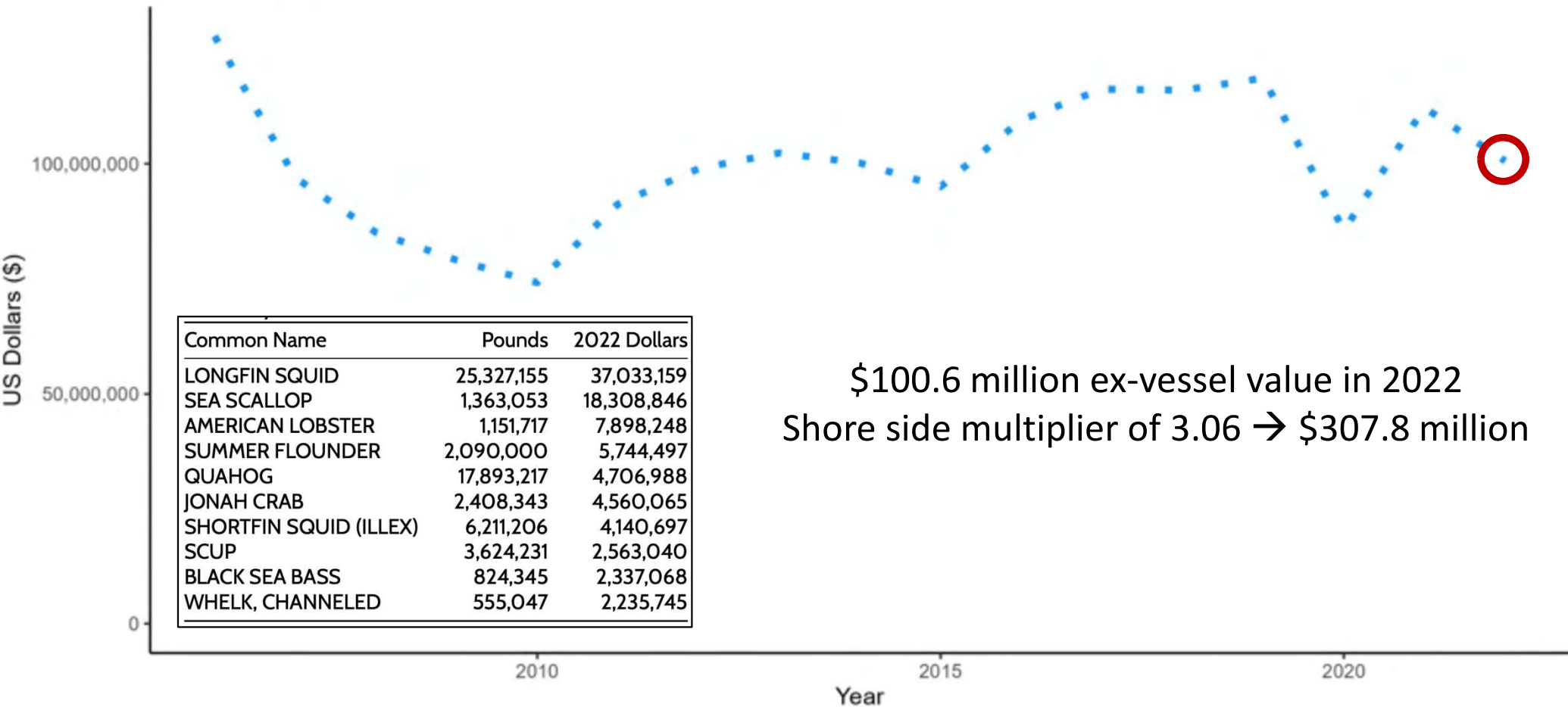
M. Conor McManus
October 6, 2023



Importance of Fisheries to Rhode Island

Commercial fisheries represent a significant component of Rhode Island's economy.

Total Landings Value



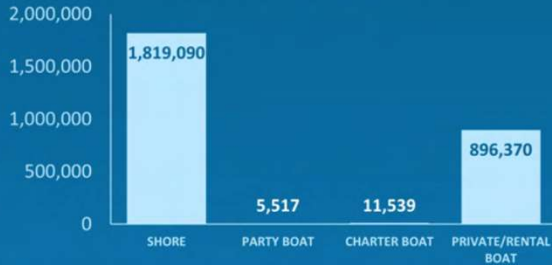
\$100.6 million ex-vessel value in 2022
 Shore side multiplier of 3.06 → \$307.8 million

All dollar values discounted to 2022 dollars to account for inflation

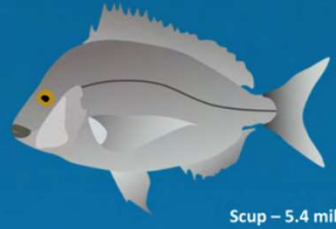
Importance of Fisheries to Rhode Island

2022 RECREATIONAL FISHING AT A GLANCE

TRIPS BY MODE



SPECIES OF INTEREST BY CATCH*



Scup – 5.4 mil



Black Sea Bass – 3.2 mil



Tautog – 2.2 mil



Striped Bass – 1.0 mil



Fluke – 417k



Bluefish – 342k



Cod – 31k

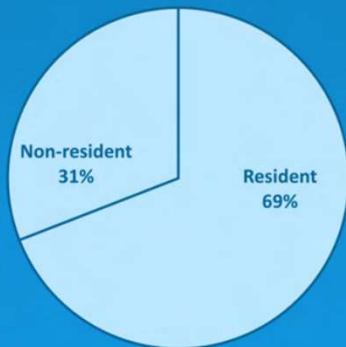


Winter Flounder – 782

TOTAL 2022 TRIPS

2,732,516

2022 LICENSES
TOTAL: 53,623

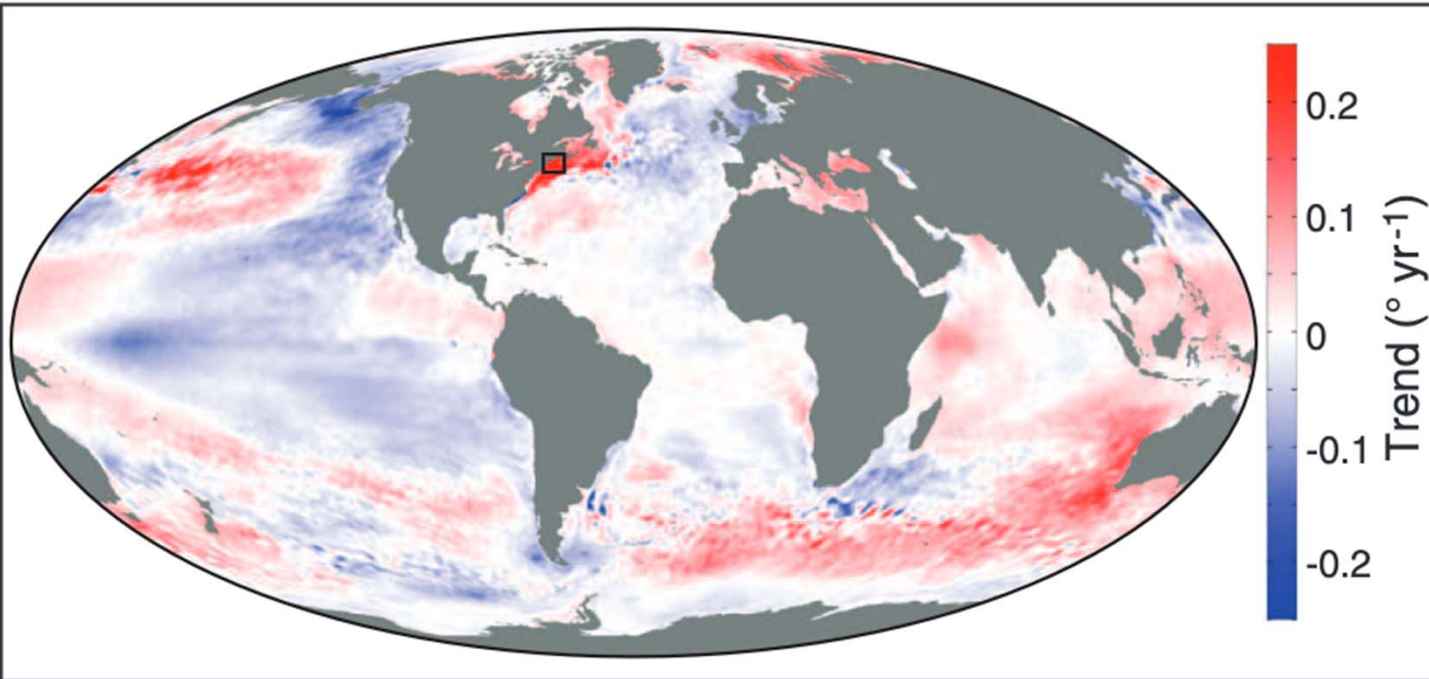


* Total catch in number of fish (including released fish)

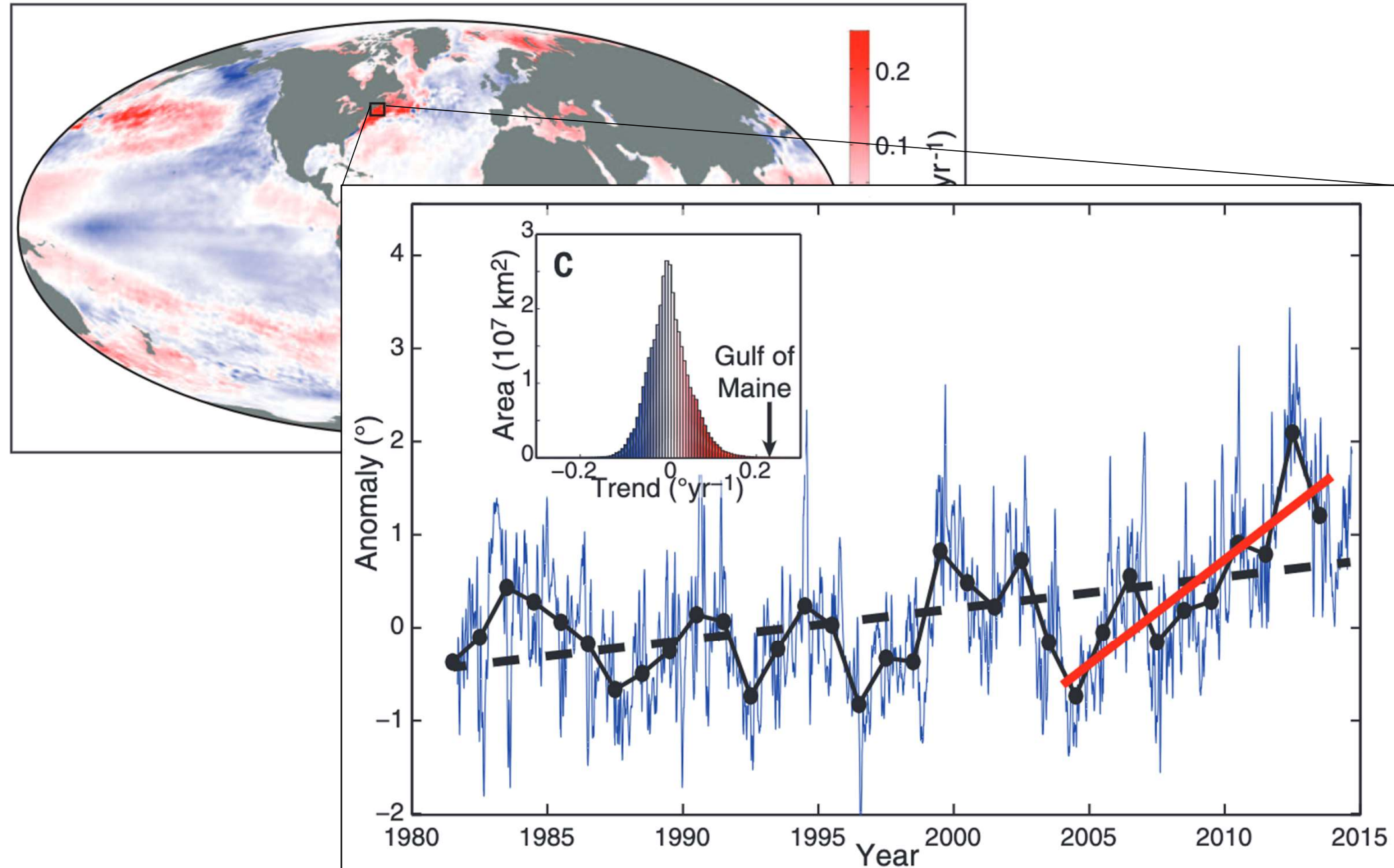
Illustrations courtesy of Integration and Application Network (ian.umces.edu/media-library).

Recreational fisheries also represent a significant portion of harvest and support both recreation and the economy.

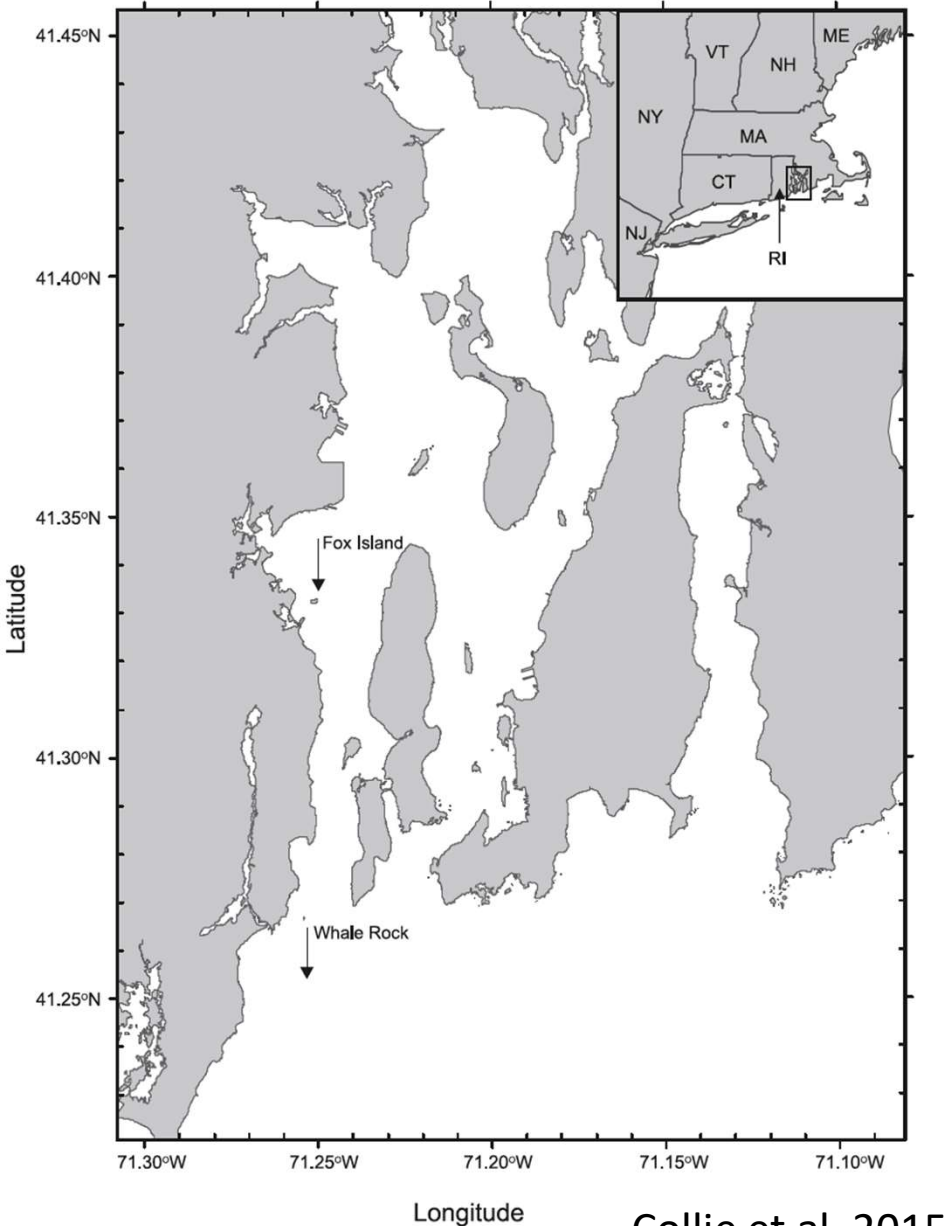
A Warming Northeast United States



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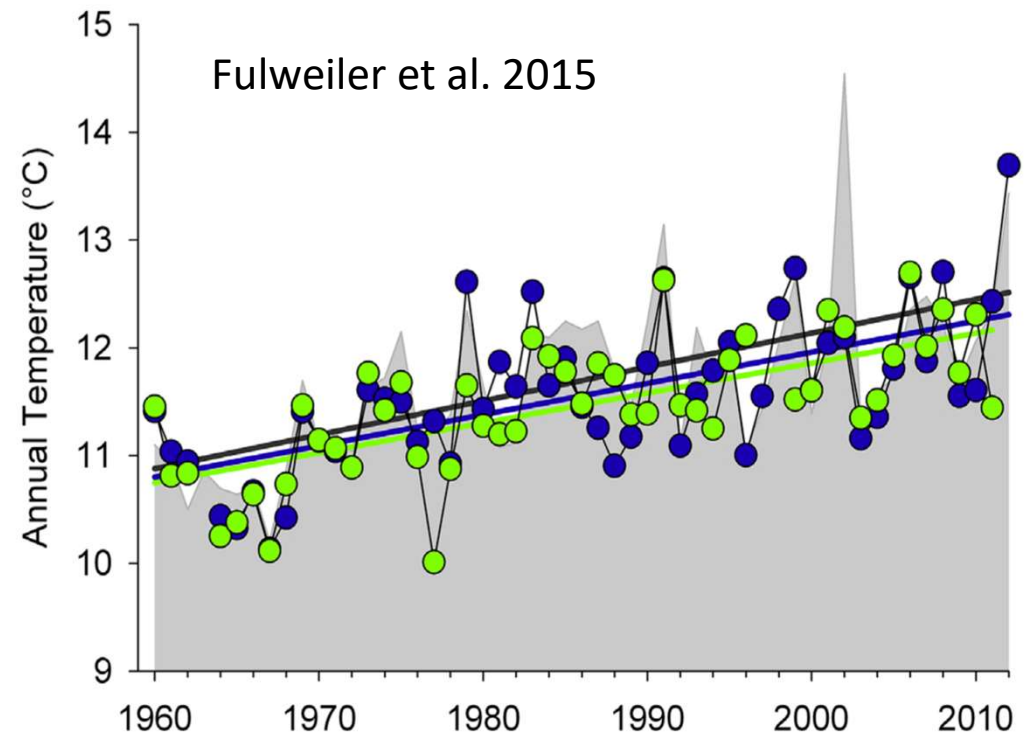


Changing Narragansett Bay Ecosystem



Collie et al. 2015

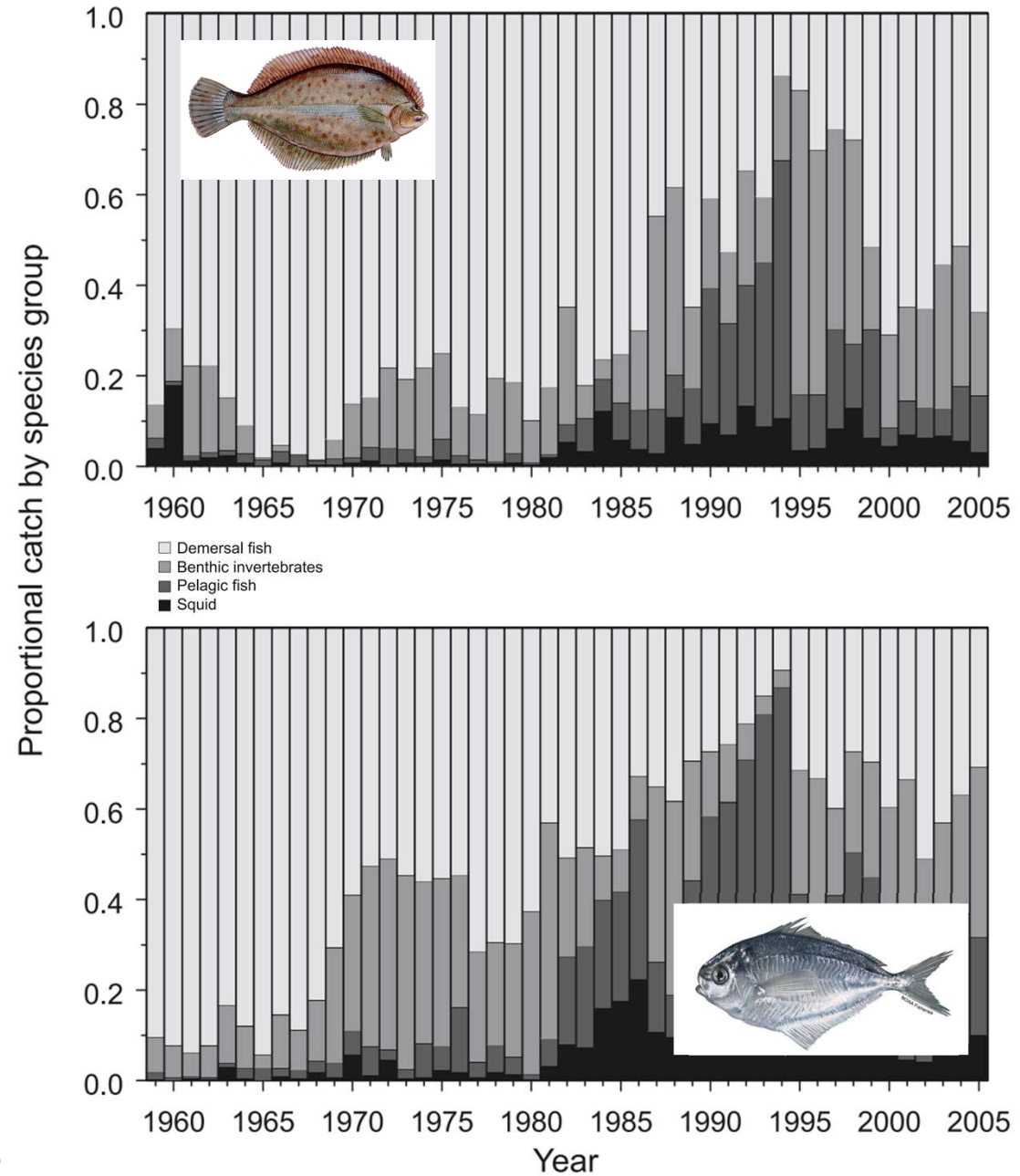
Sea surface temperature has increased in the Bay over time.



Changing Narragansett Bay Ecosystem

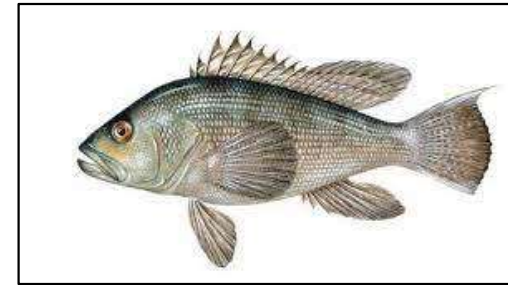
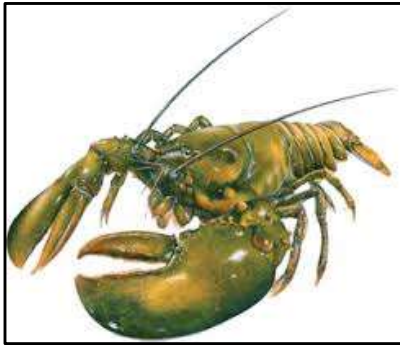


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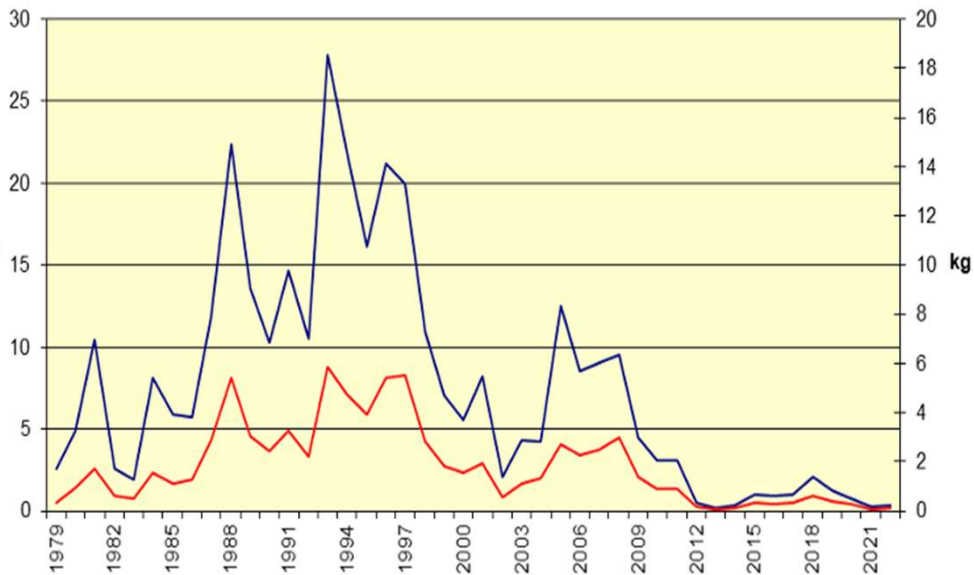
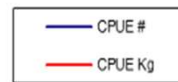


Winners and Losers of Climate Change

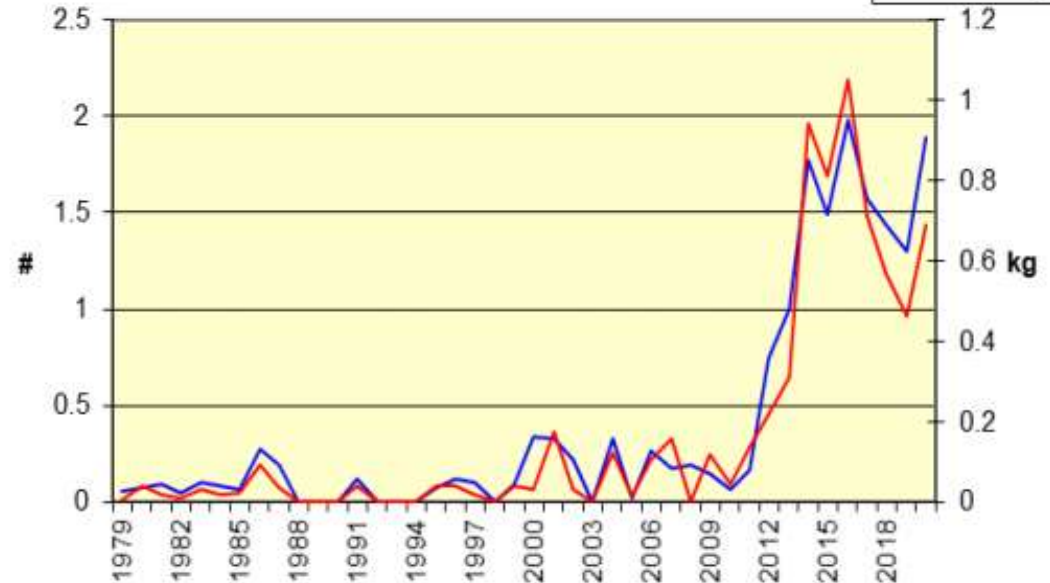
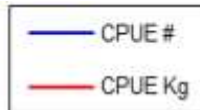
As Narragansett Bay waters warm, there will be climate change 'winner' and 'loser' species.



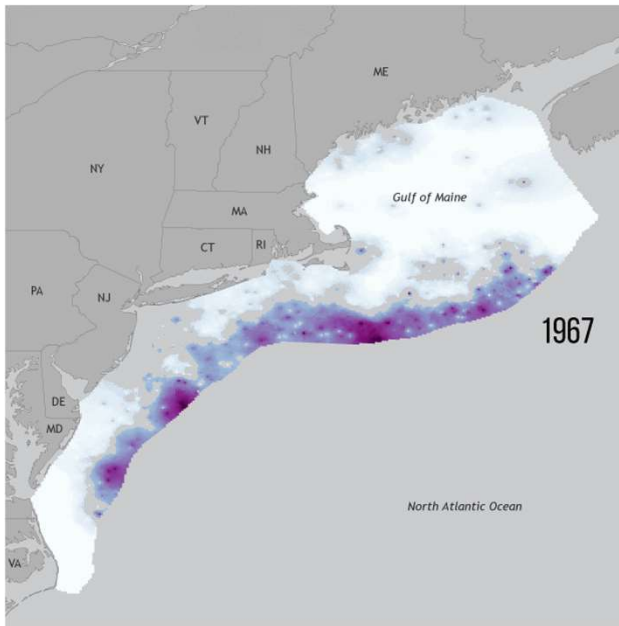
American Lobster Fall Survey



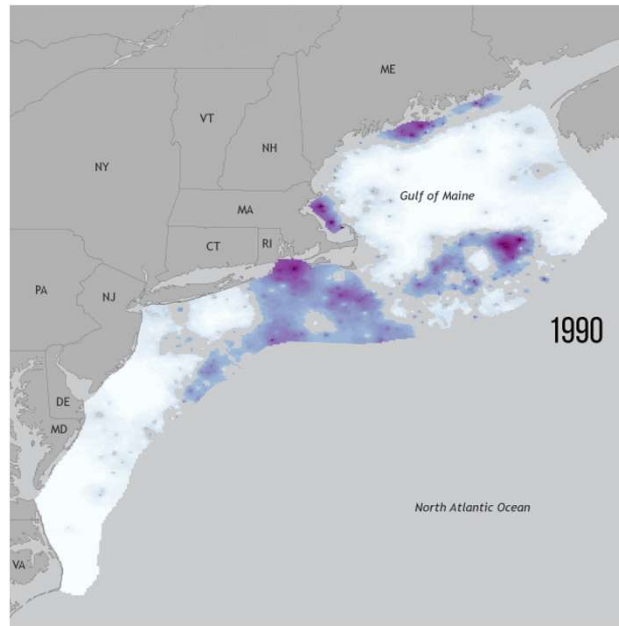
Black Sea Bass Spring Survey



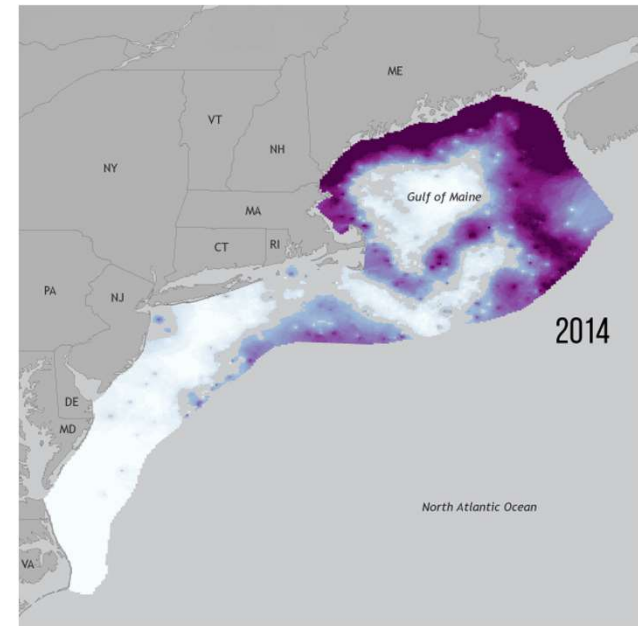
Lobster Biomass Shift North



Pre-Lobster Boom



SNE Boom

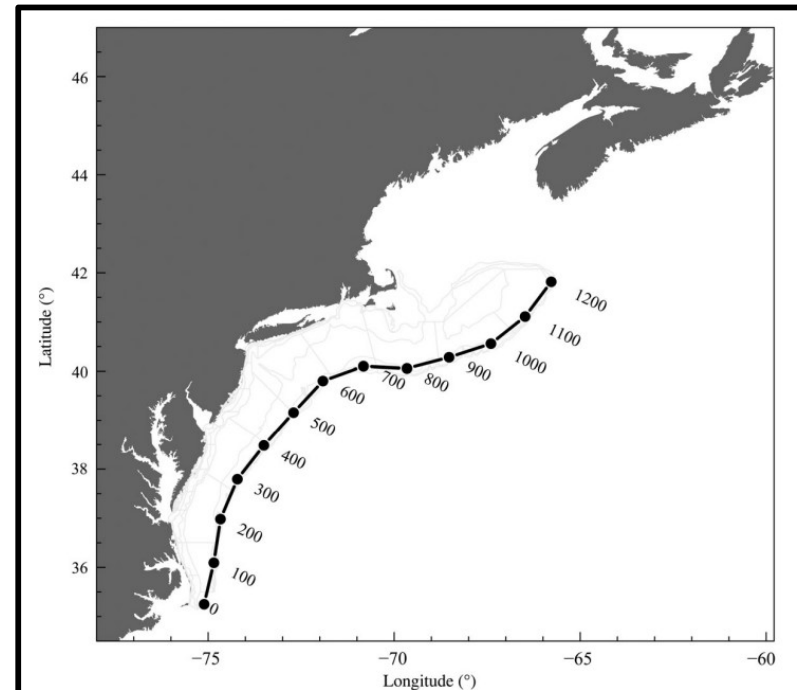
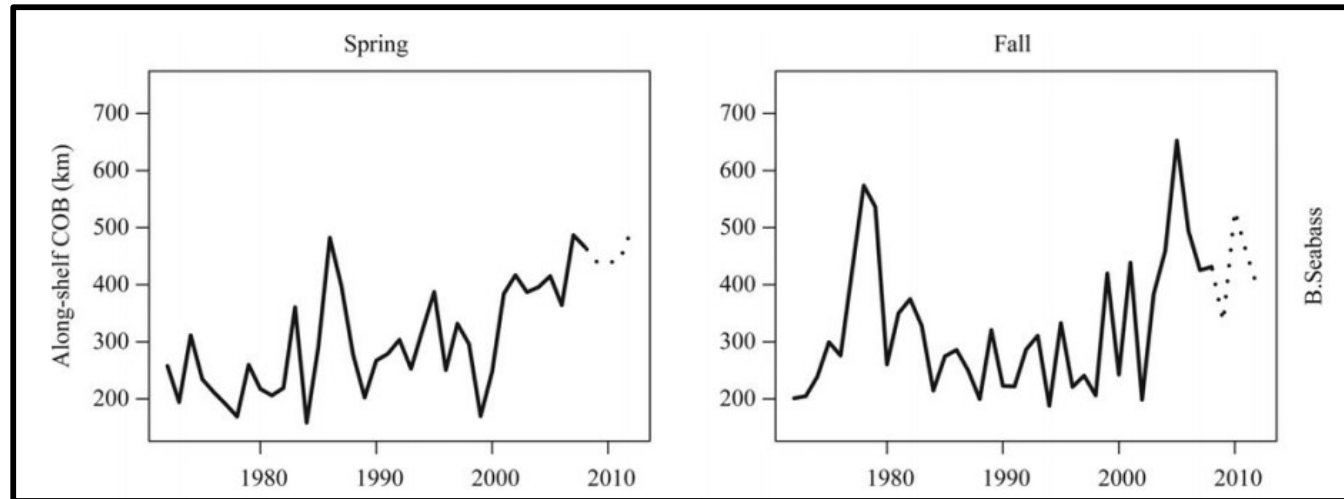


GOM Boom

Black Sea Bass Expansion North

Warm waters have led to northern expansion.

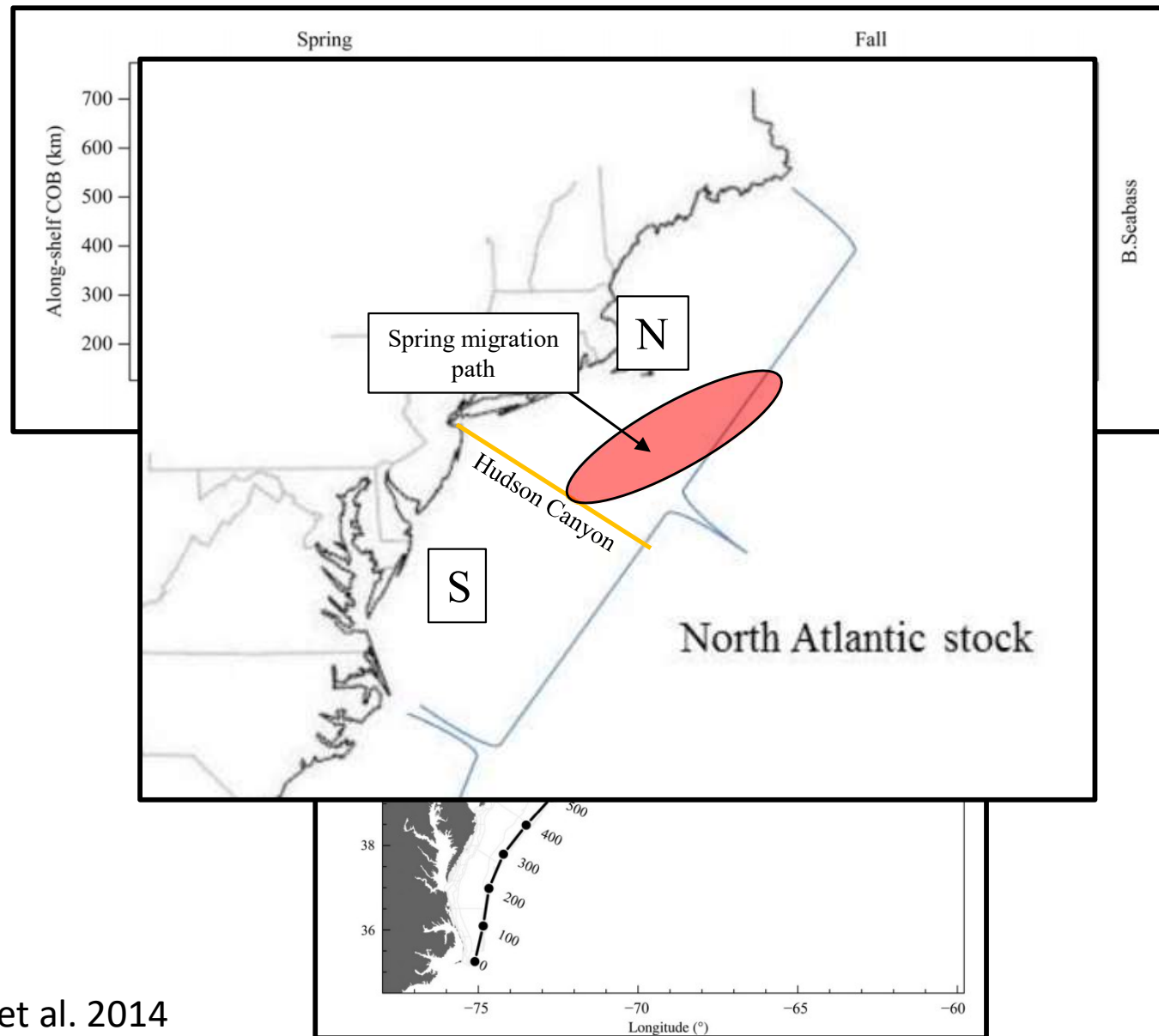
Better overwinter survival offshore.



Black Sea Bass Expansion North

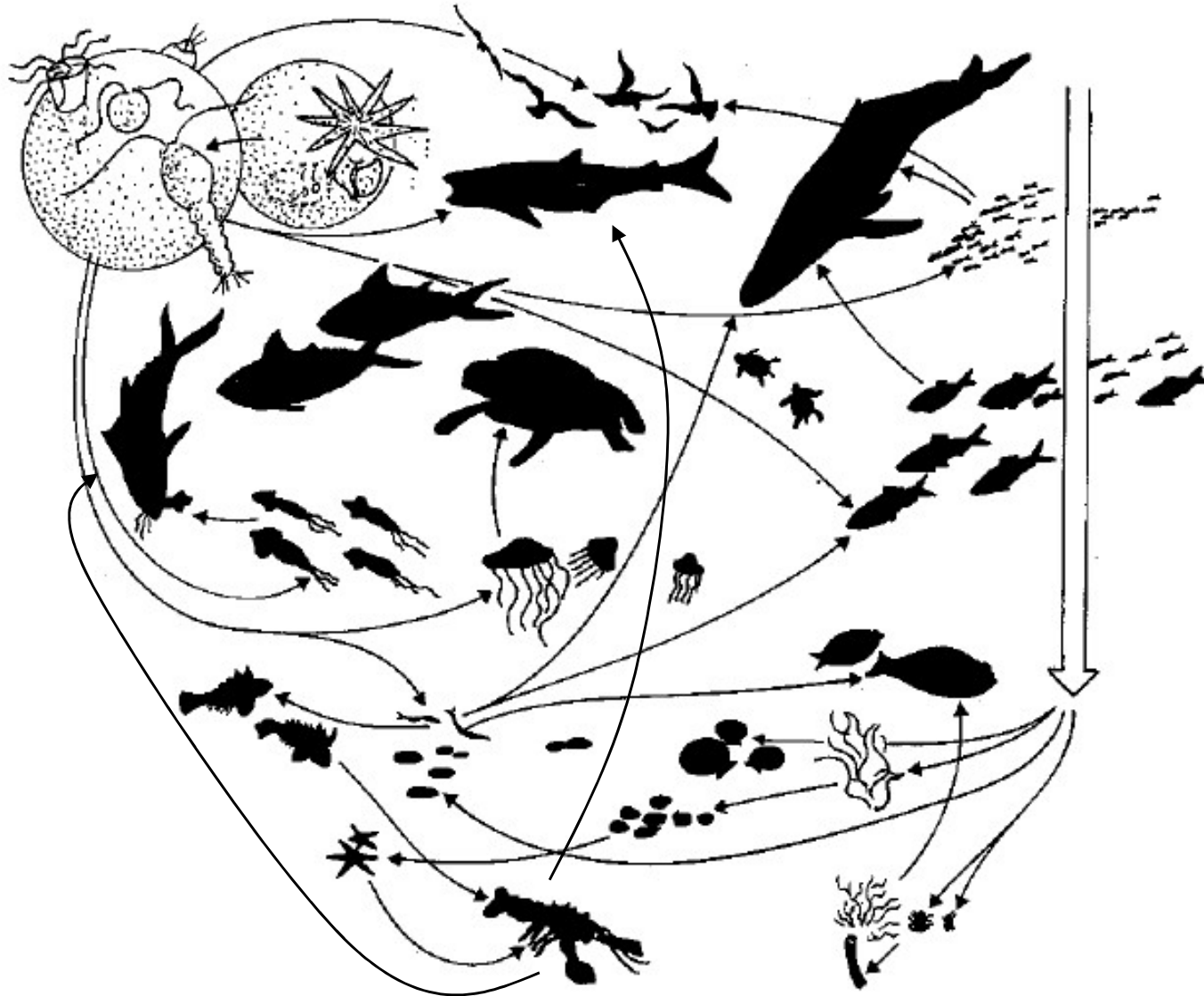
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As the players change, how do the ecosystems?

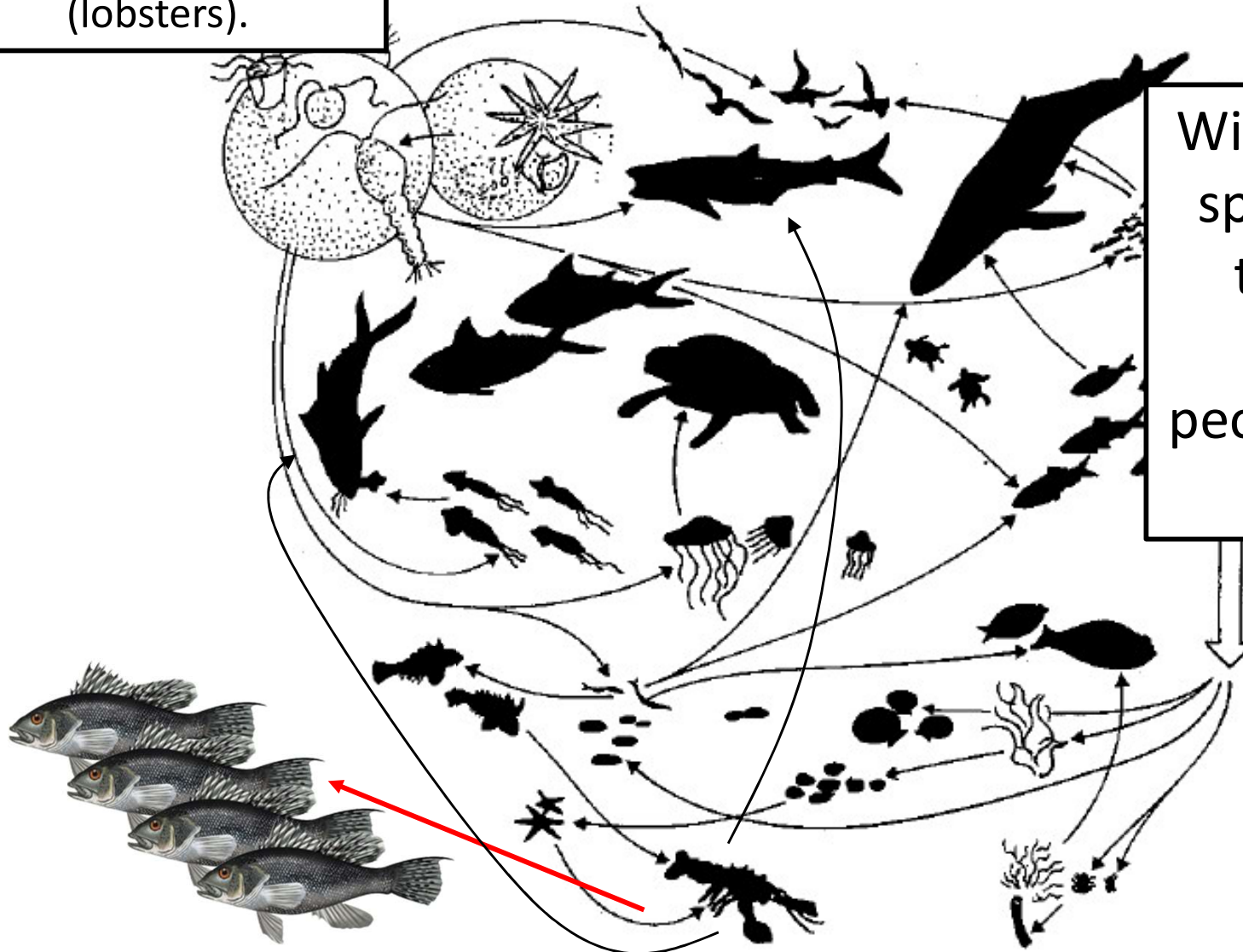
Narragansett Bay / Rhode Island
Ecosystem



As the players change, how do the ecosystems?

Increase in black sea bass could mean decreases in their prey (lobsters).

Narragansett Bay / Rhode Island Ecosystem



Will changes in Bay species alter how the ecosystem functions and people's interaction with it?

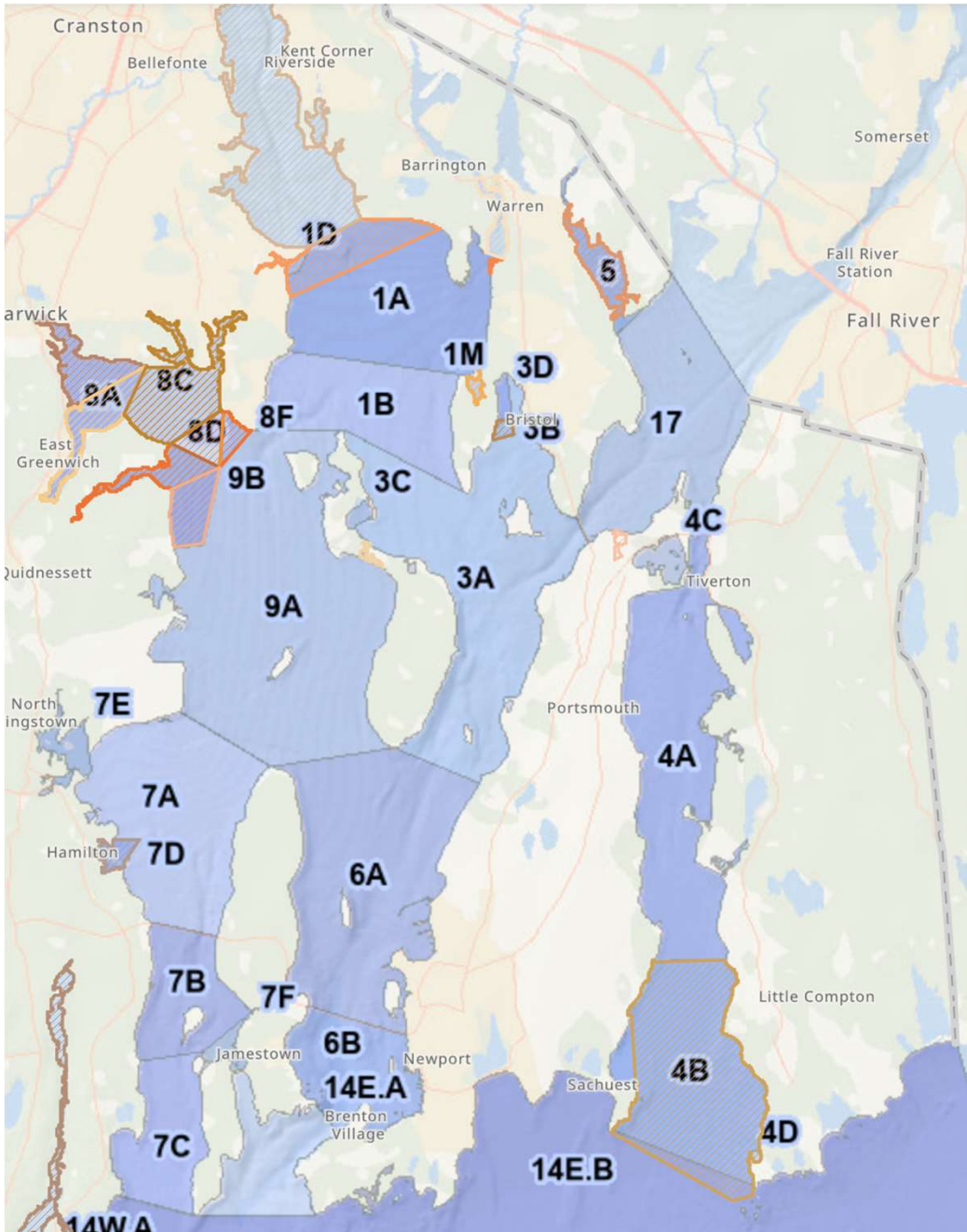
Hard clam, or Quahogs

- Filter-feeding bivalves
- Prefer complex-sandy substrate.
- Strong recreational, commercial, and cultural significance.
- Various market classes
 - Chowders
 - Cherry Stones
 - Top Necks
 - Little Necks

Increase in size



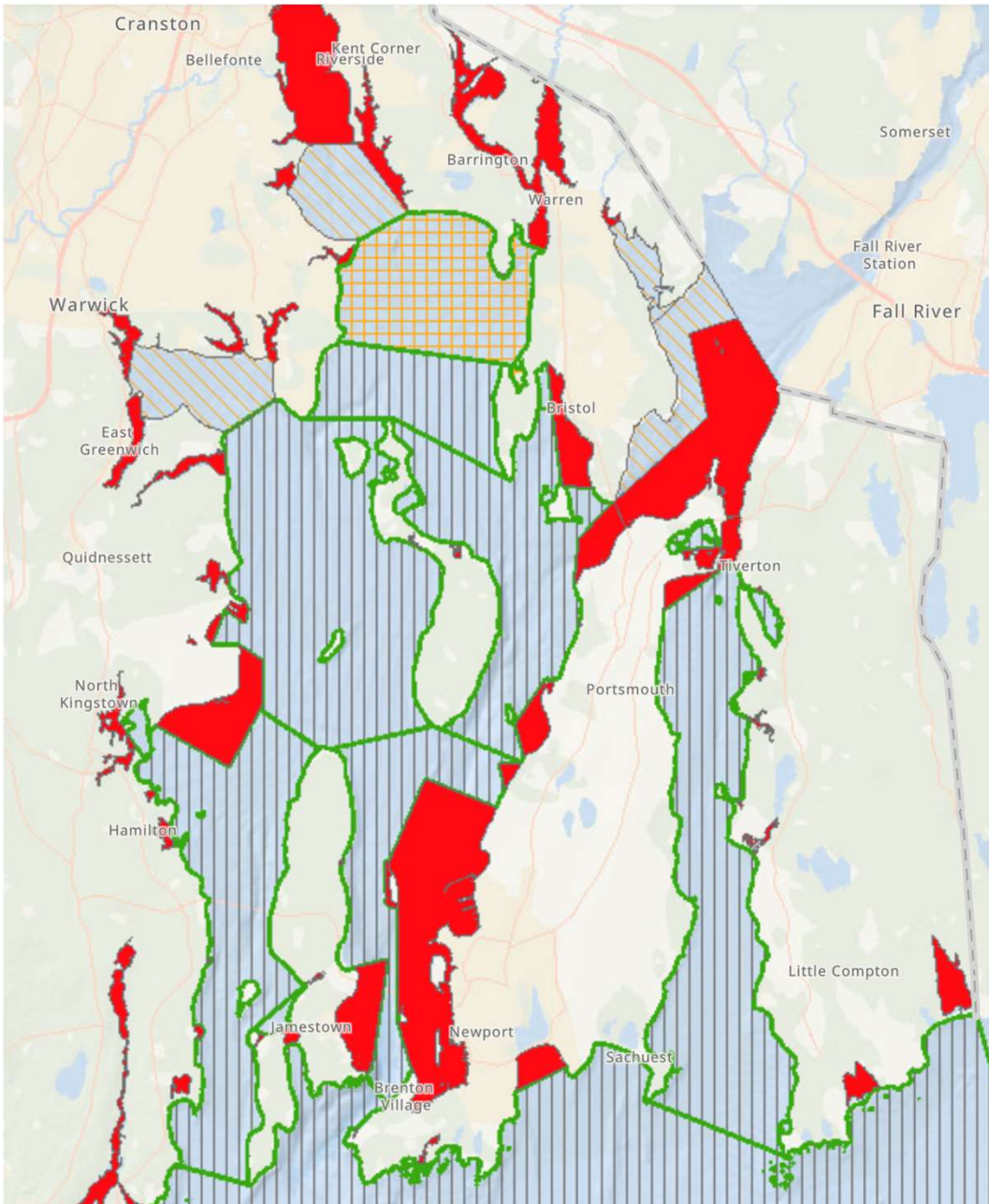
RI Shellfish Management



Shellfish Management Areas

- Implement regulations on harvesting quahogs.
 - Size (1" hinge width).
 - Possession limit (bushels).
 - Weekly and seasonal openings.
- Areas where shellfish are harvested are reported to dealers to track fishing effort spatially.

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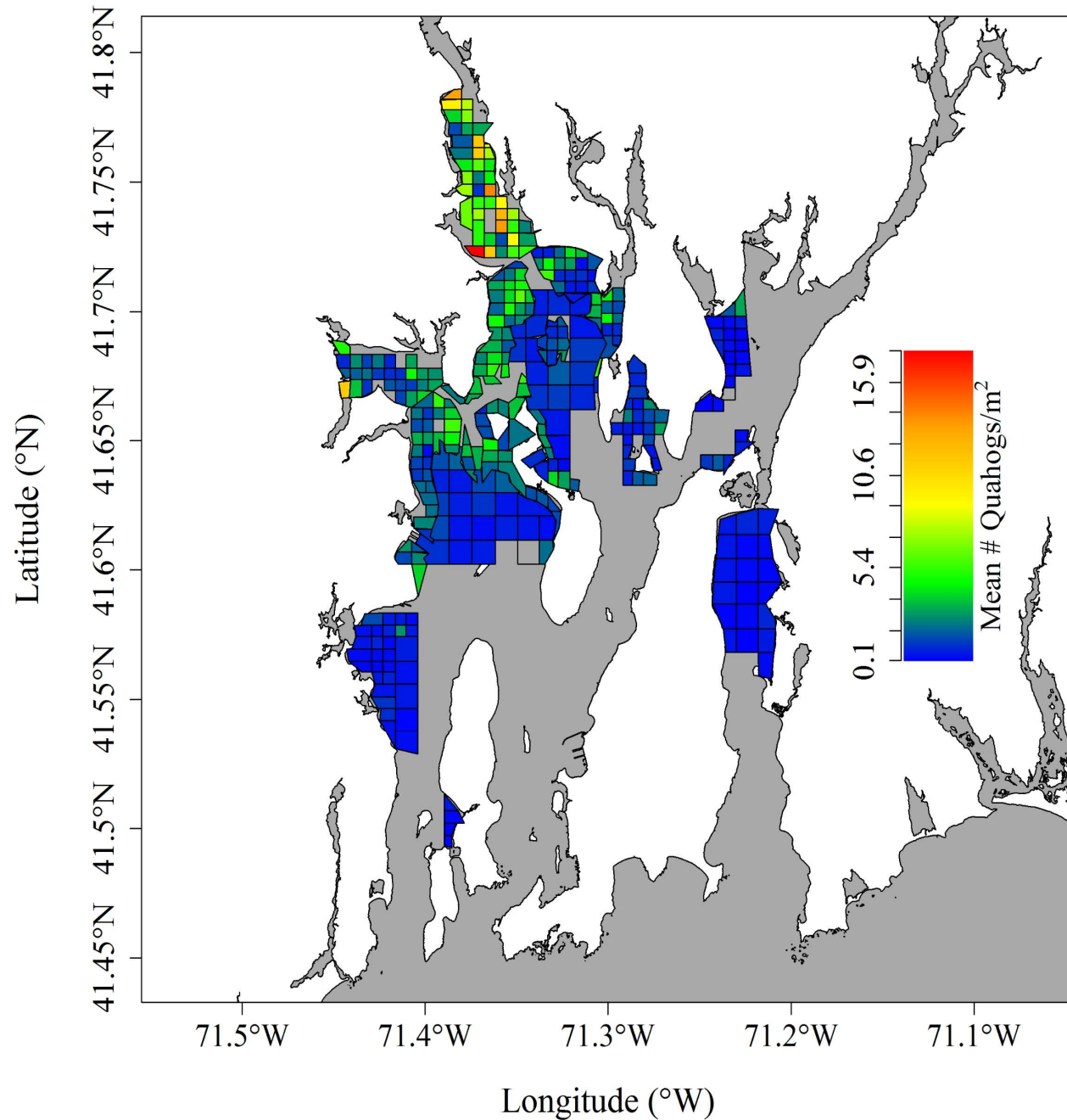
Water Quality

- Areas permanently closed to shellfish harvest due to effluent runoff. (Greenwich Bay Coves).
- Conditionally closed during high rainfall events and increased effluent loading (Lower Providence River, Upper Narragansett Bay).

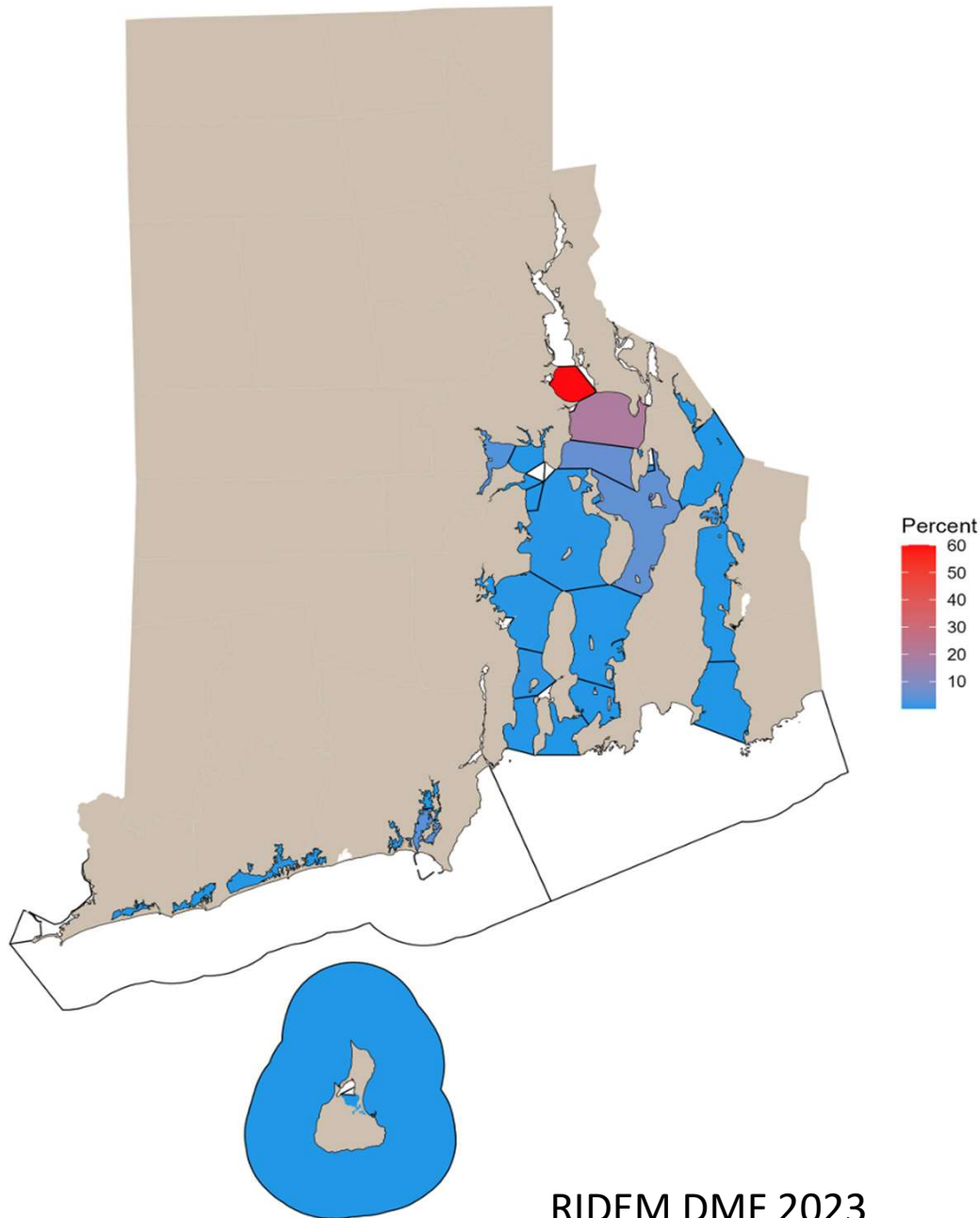
Quahog Abundance Data

Dredge surveys used to monitor the population.

Greatest densities have been in northern or inner regions of the Bay (often tied with water quality closures).



Quahog Landings Spatially



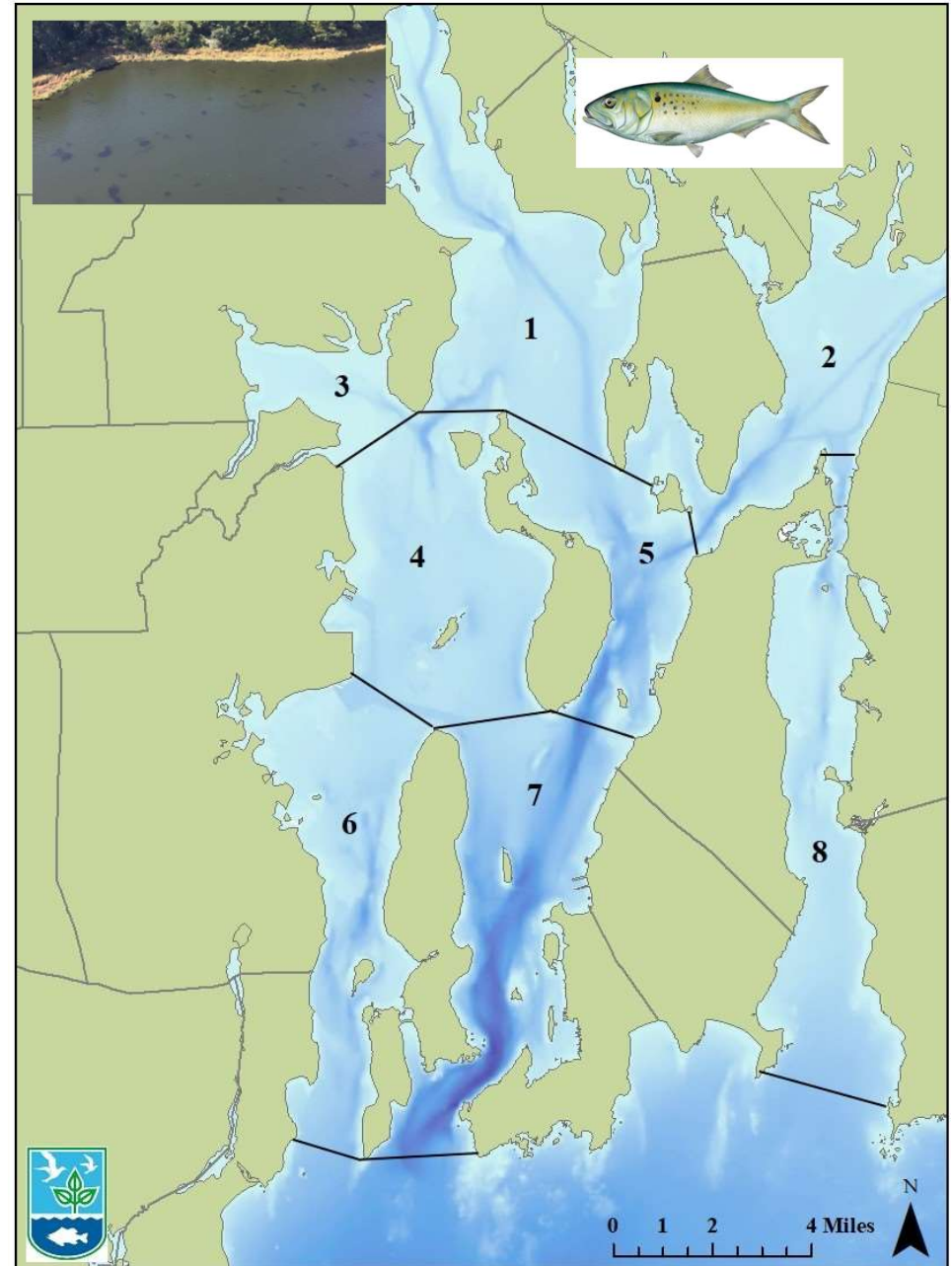
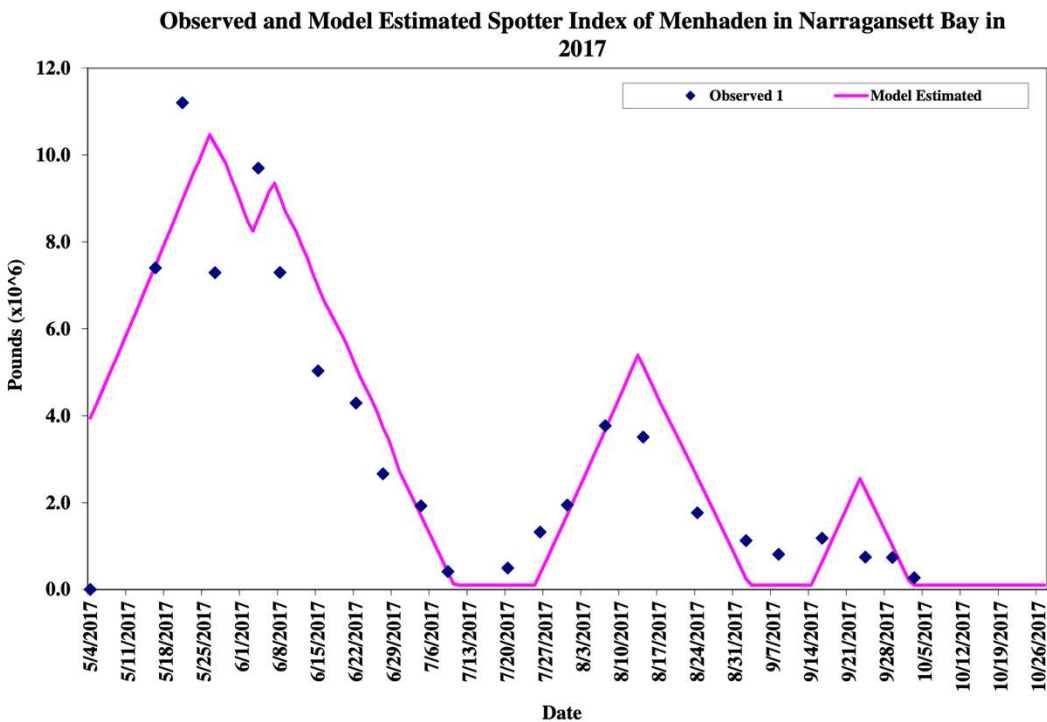
Greenwich Bay and Upper Narragansett Bay have long been major harvest areas.

Since opening the lower Providence River, the area can now constitute for up to 60% of landings annually (2022).

Opening of this area highlights the changing fishery dynamics based on the interactions between water quality and marine fisheries

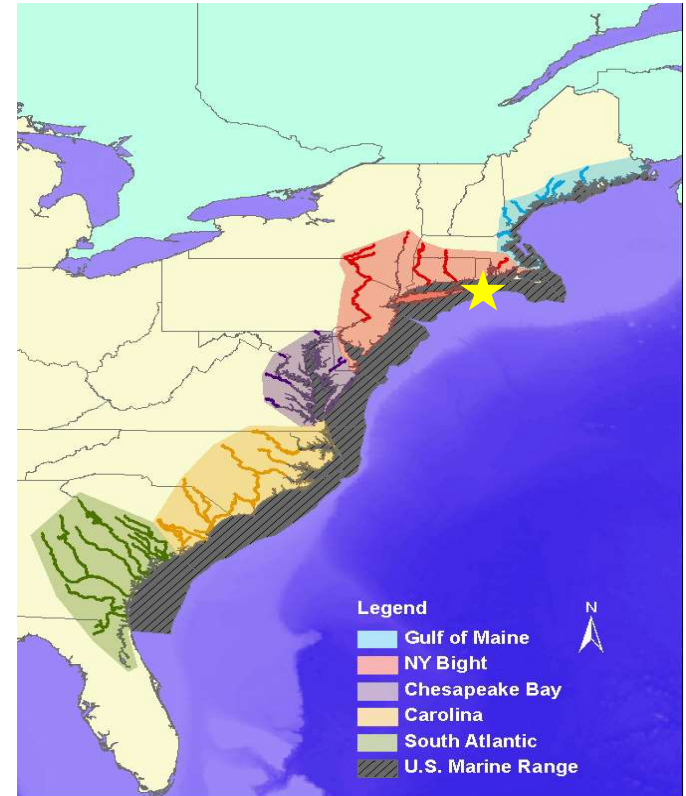
Narragansett Bay Menhaden

- Menhaden support a range of uses for the Narragansett Bay ecosystem (e.g. commercial fisheries and prey species).
- Spotter pilot survey data used to estimate menhaden biomass in the Bay and inform commercial harvest management.
- Biomass moving into the Bay each year is highly variable - what drives this variability?



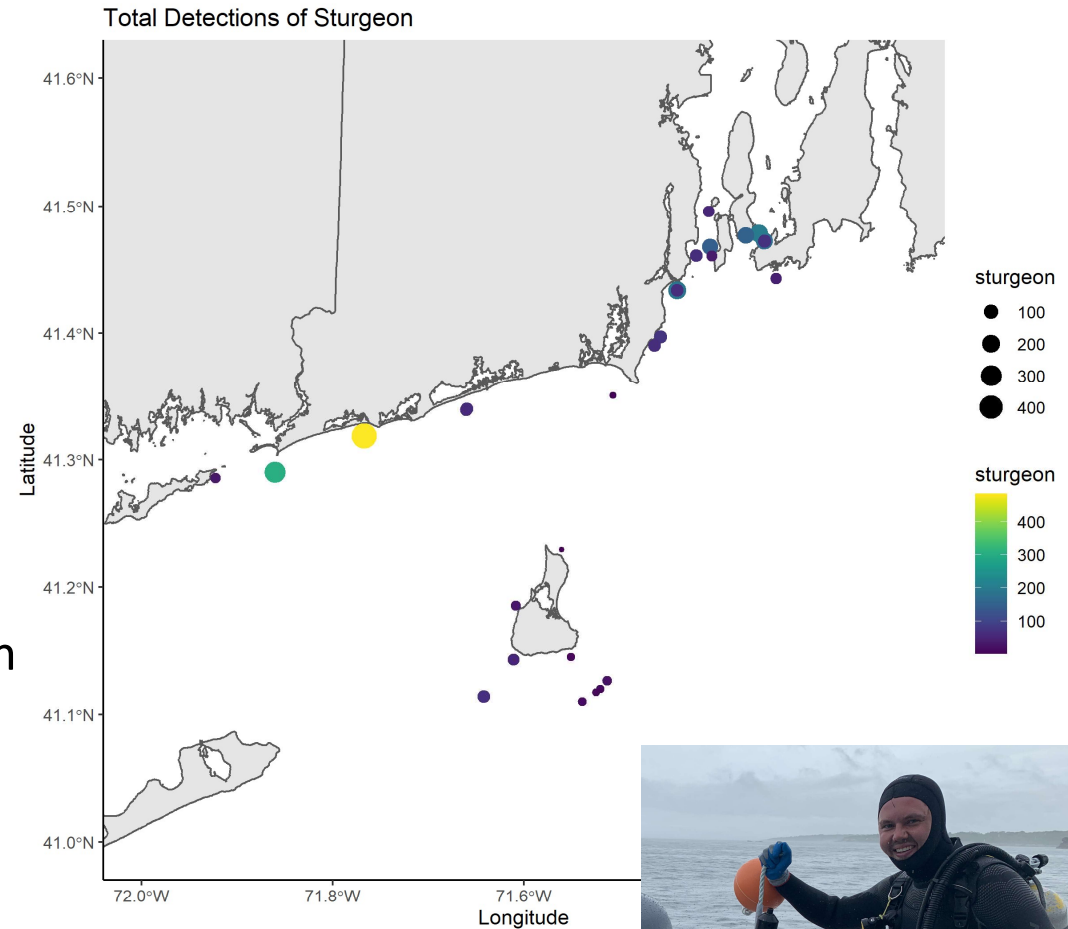
Atlantic Sturgeon

- Historically Atlantic sturgeon spawned in the Taunton River, which is connected to the Atlantic by RI waters (e.g. Mt. Hope Bay, Narragansett Bay, Sakonnet River).
- No evidence of spawning of Atlantic in the Taunton River in the last 20 years.
- Sturgeon continue to use habitats within the Taunton River, Narragansett Bay and Sakonnet River, as well as RI's coastal waters as part of their overall marine range.



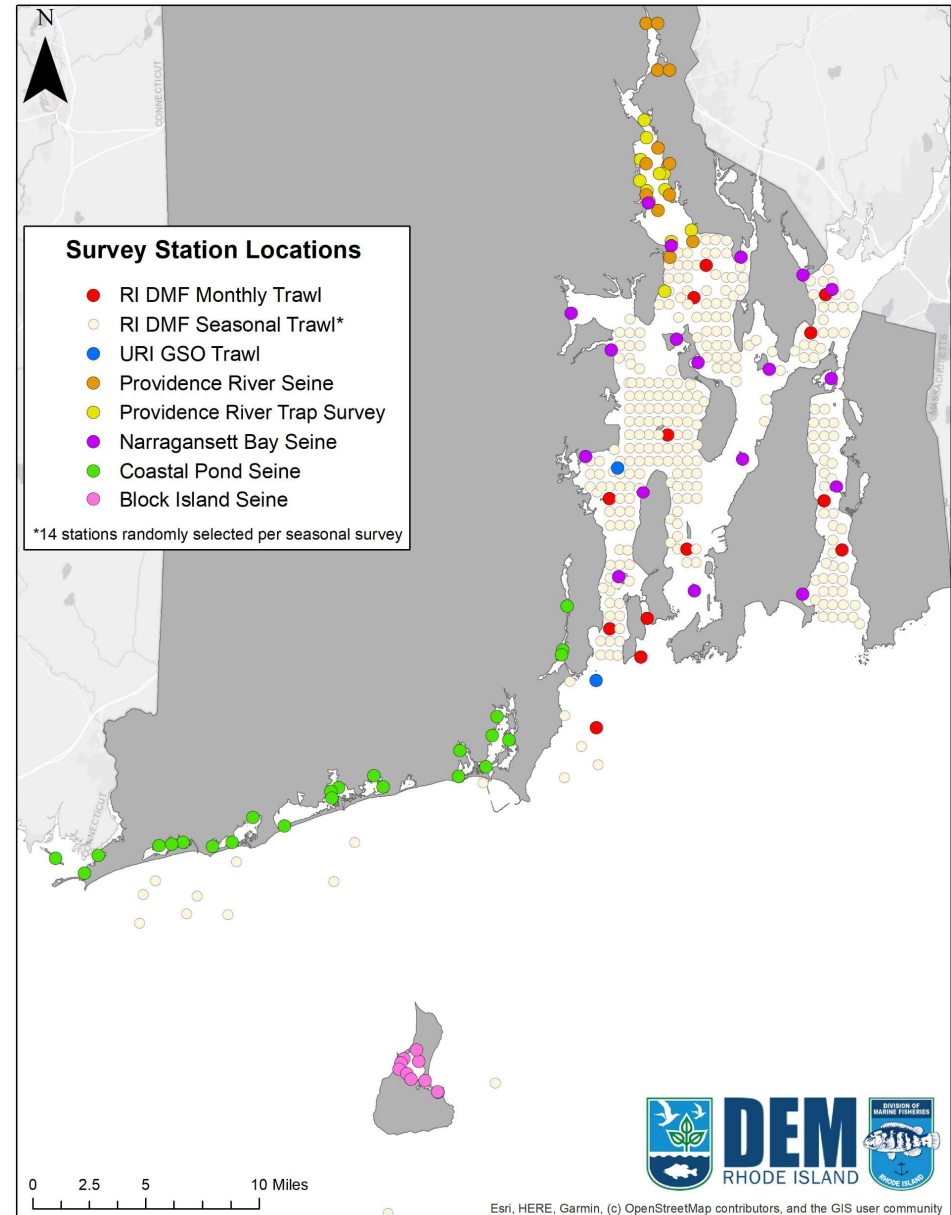
Atlantic Sturgeon

- Prior to 2018, very little information regarding if/when/where Atlantic sturgeon are using Rhode Island waters.
- In 2019, RIDMF and the Atlantic Shark Institute developed an acoustic receiver network that “listens” for acoustically-tagged fish.
- Through partnerships and data sharing with other scientists, new insights on how fish utilize Rhode Island waters and Narragansett Bay are available.



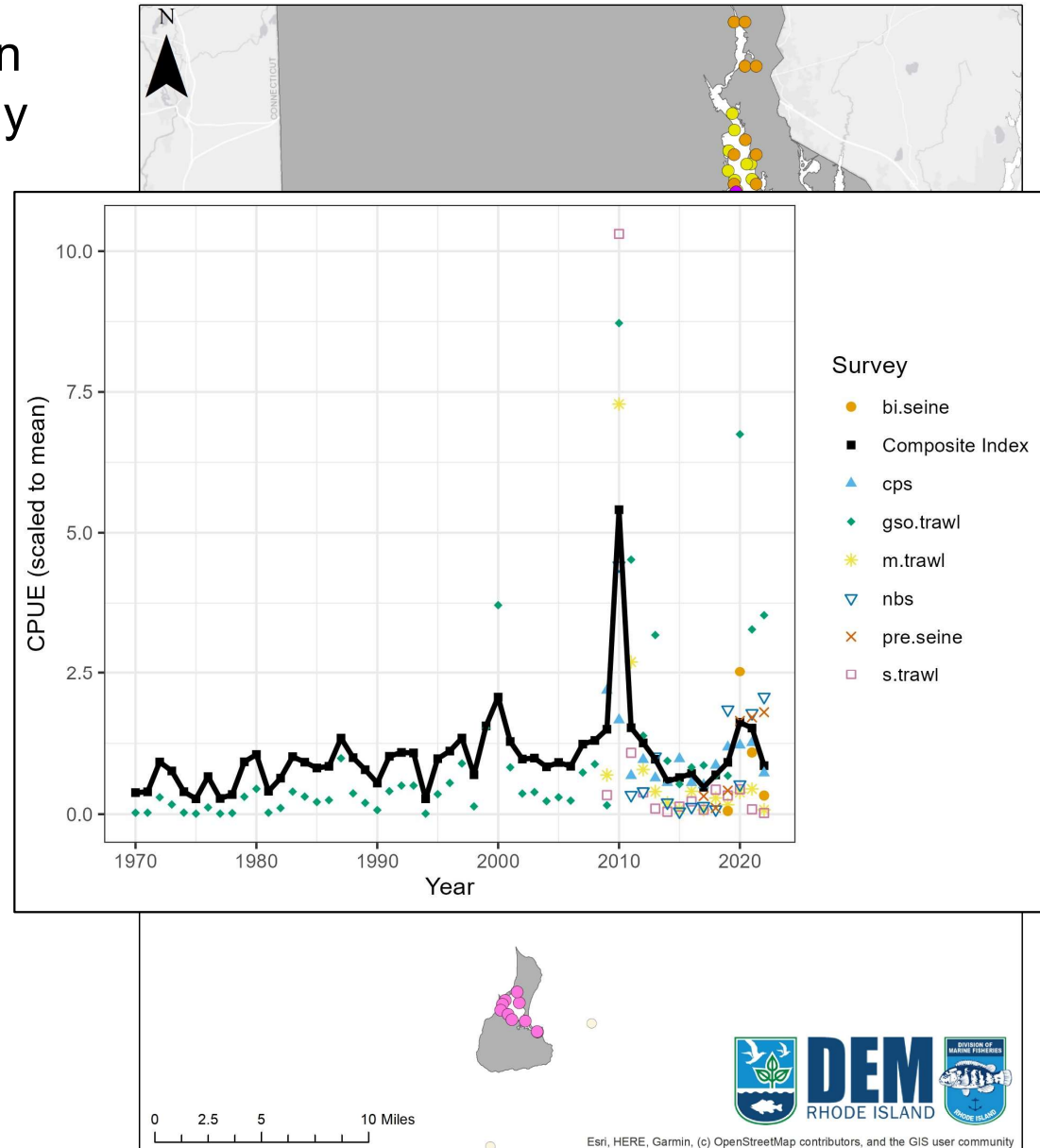
Blue Crab

- Blue crabs have historically been low in abundance in Rhode Island, particularly compared to southern areas like the Chesapeake Bay.
- Increased interest in trying to quantify how blue crabs populations have changed in Rhode Island over time.



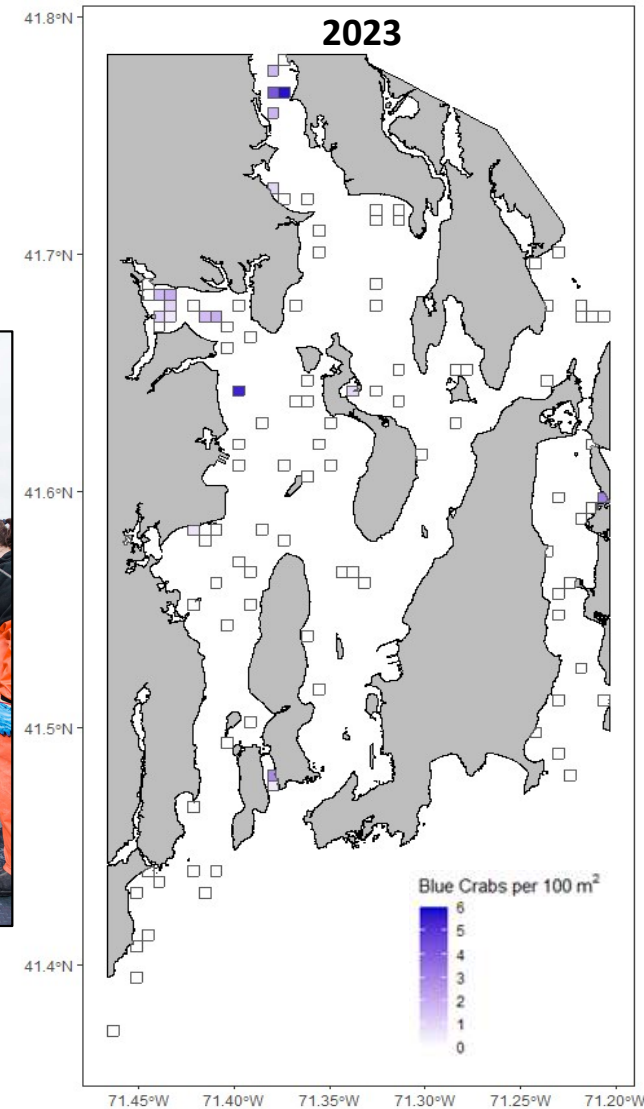
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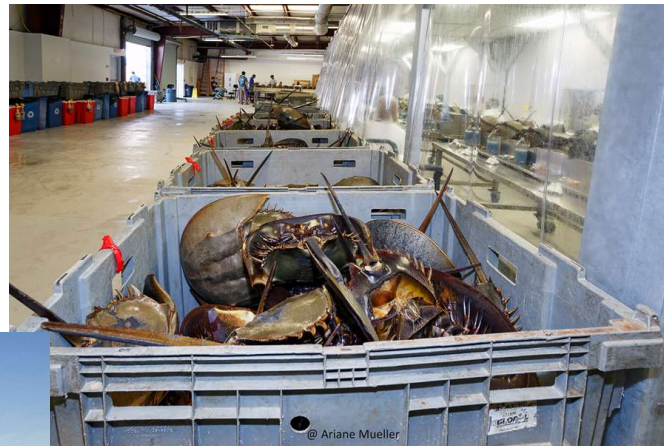
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The Future of Fisheries in Under Climate Change

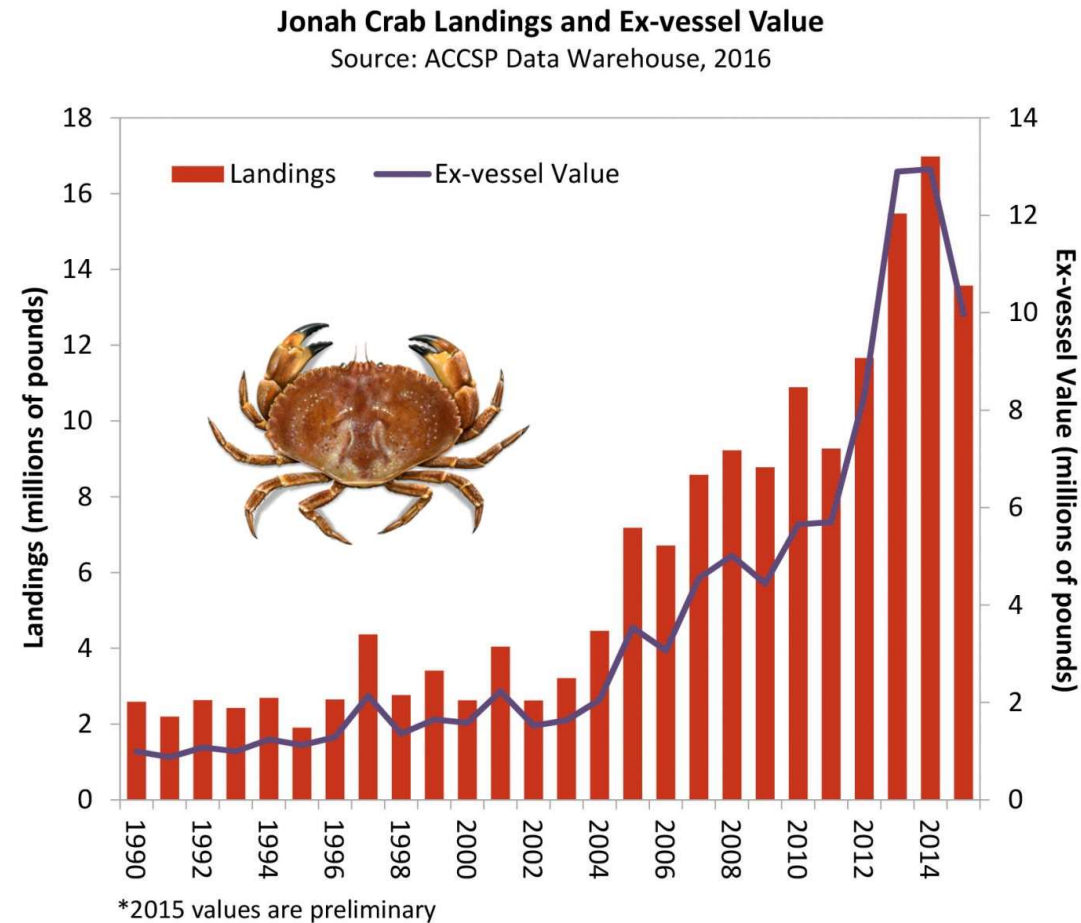
Decline in major, single fisheries has led to greater diversity in the fisheries that harvesters participate in → portfolio fishing.



Lobster Fishery Adaptation Under Climate Change

Jonah Crab Example

- A common bycatch species in lobster traps.
- Landings increased with:
 - Fewer lobsters in SNE.
 - Increase in prices and demand for other crab species.



A diver is shown underwater, wearing a black wetsuit, a blue diving mask, and a regulator. The diver's right hand is raised in a gesture of thanks. A white text box with the words "Thank You!" is overlaid on the left side of the image. The background is a clear, blue-green underwater environment. The diver's wetsuit has a patch that says "Liberatory" and "USA".

Thank You!

**With any questions or inquires,
please reach me at
conor.mcmanus@dem.ri.gov**

Harvesting History – Rhode Island Quahog Landings

Improved water quality opened waters to harvest.
Quahoggers responded by harvesting more.

