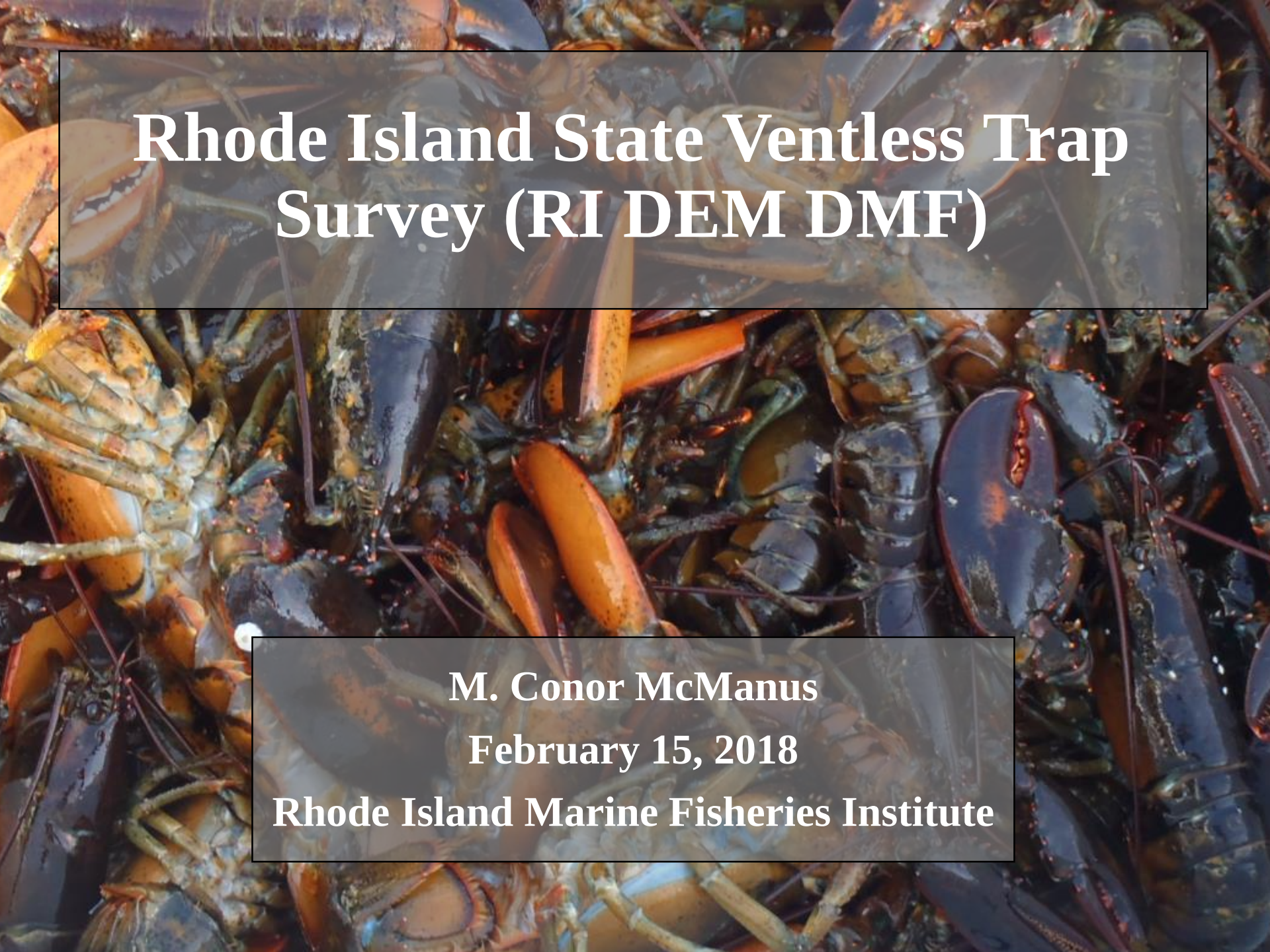


Rhode Island State Ventless Trap Survey (RI DEM DMF)

M. Conor McManus

February 15, 2018

Rhode Island Marine Fisheries Institute

Ventless Trap Survey Initiative

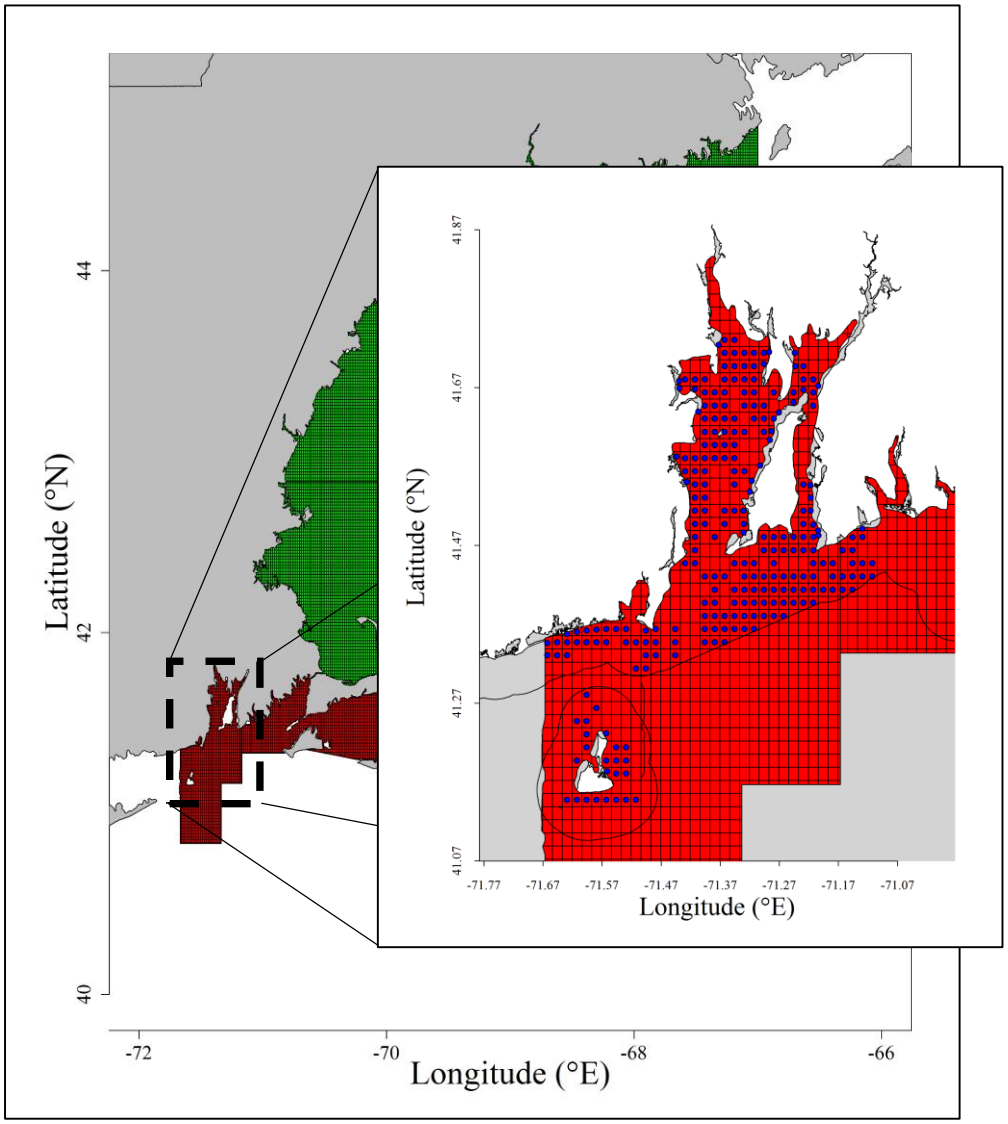
For many years, trawl surveys were the primary fisheries-independent data source to assess lobster populations.

However, trawl surveys typically:

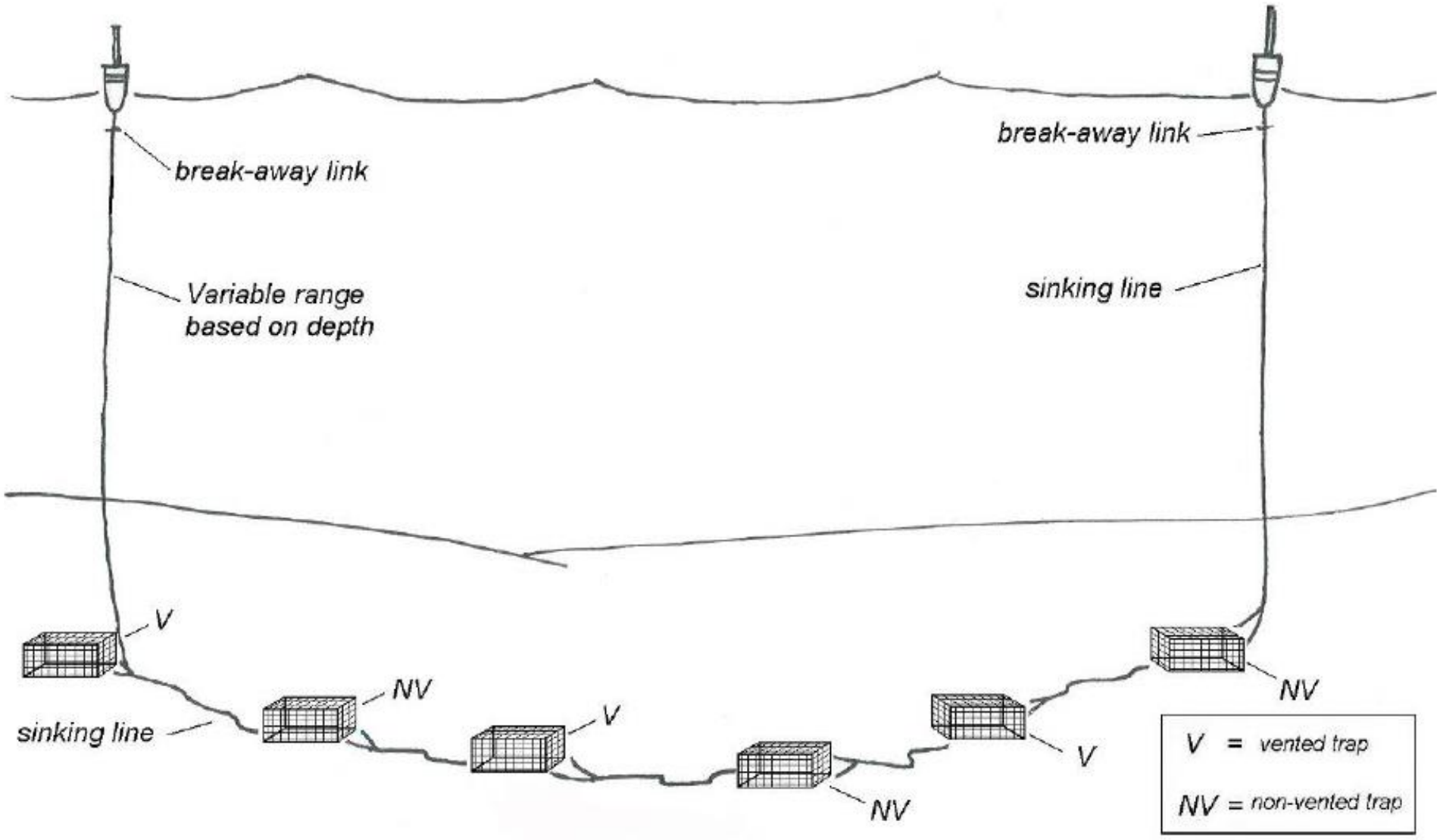
- Can't access preferred lobster habitat (rocky and ledge areas).
- Can't operate in areas with static gear present.

Ventless Trap Surveys can sample productive habitats and better assess sub-legal lobster populations. State programs in:

- Maine
- New Hampshire
- Massachusetts
- Rhode Island

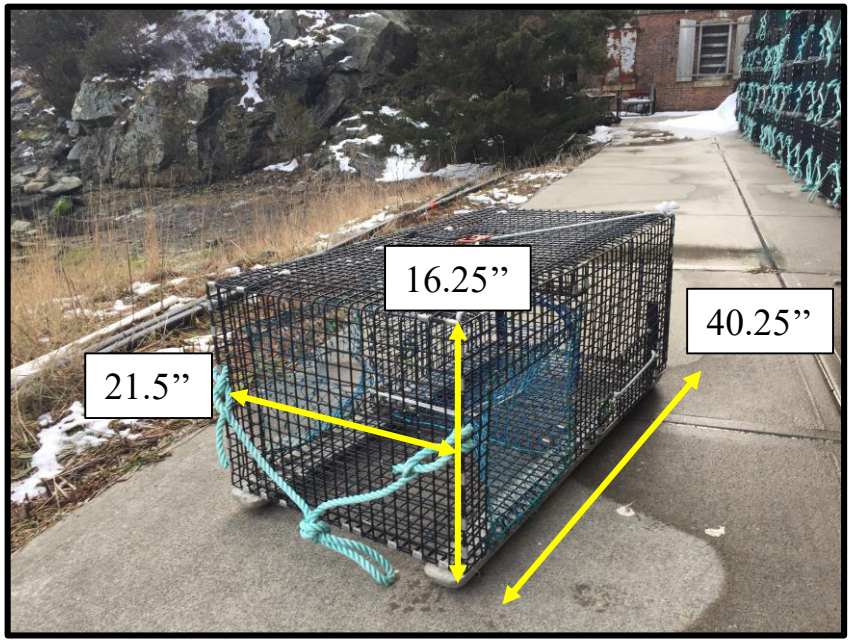


Trap Haul Design

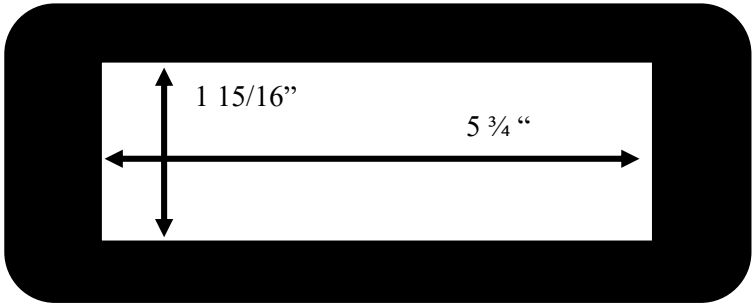


Glenn and Pugh, 2009

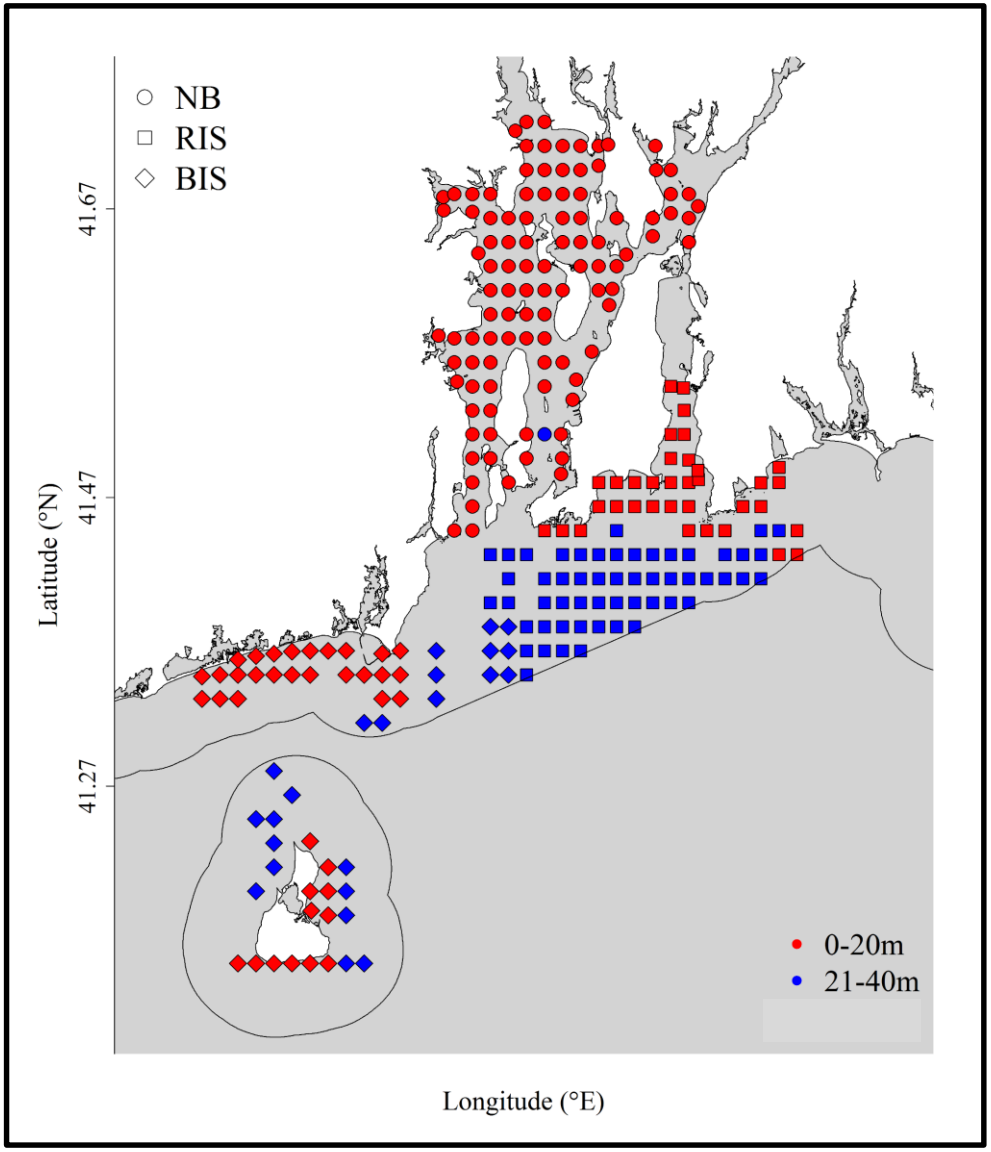
Trap Dimensions



Vent Size



Station Selection



Stations sampled from three discrete regions:

- Narragansett Bay (7, circles).
- Block Island Sound (8, diamonds).
- Rhode Island Sound (9, squares).

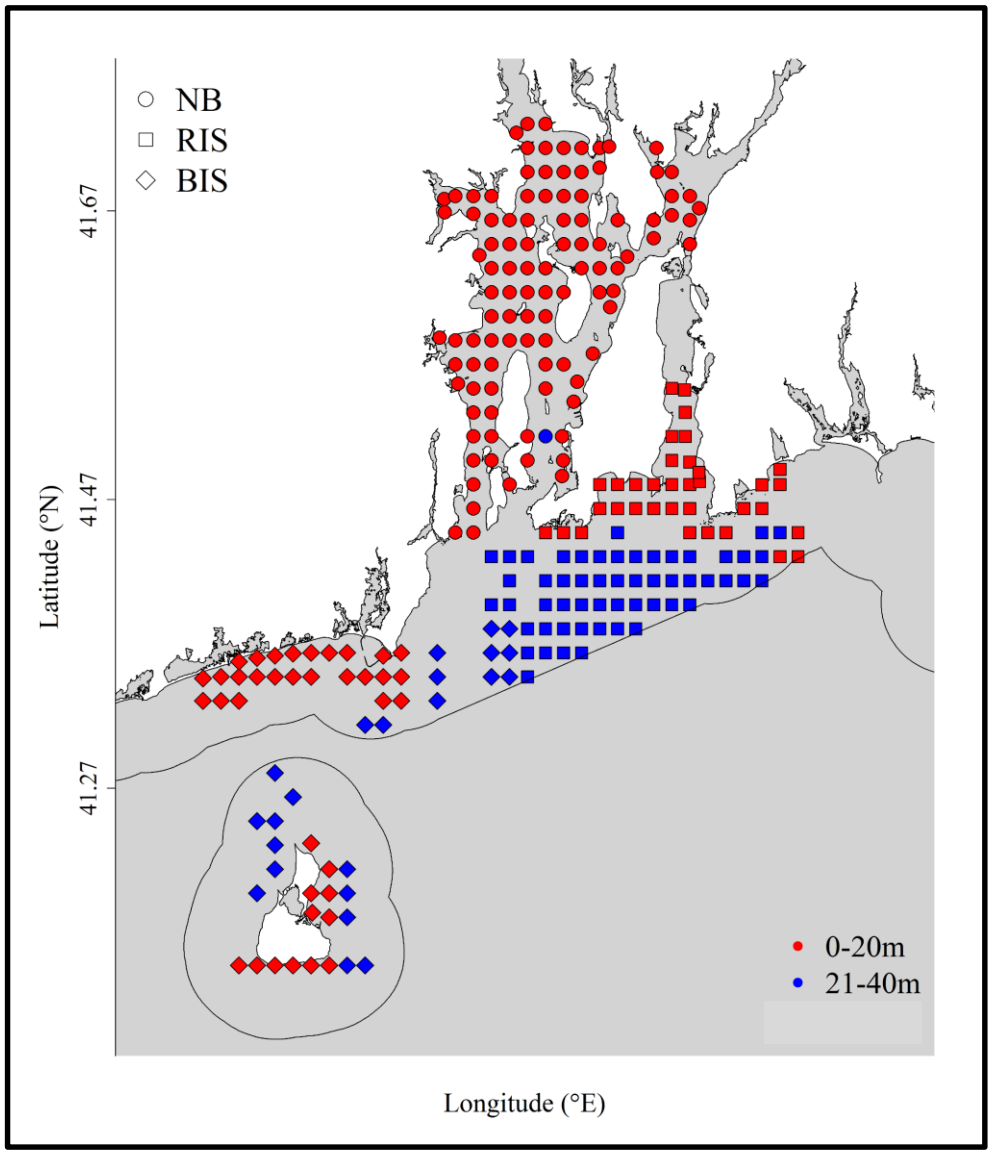
Stations are limited to state waters only (within 3 nautical miles).

Stations selected randomly.

- Alternative sites randomly selected if there are site conflicts (e.g. drag grounds, shipping lanes).

Each station is sampled twice per month on a 3 night soak.

Station Selection



Number of Traps Sampled By Year

Year	June	July	August	September
2006		276	288	288
2007	278	288	282	
2008	288	288	288	
2009		264	276	264
2010		288	282	288
2011		288	288	282
2012	275	275	283	
2013	280	281	275	
2014	282	261	285	
2015	283	286	278	
2016	286	270	269	
2017	262	273	288	

Data Collection

Haul:

- Lat/Lon
- Soak Time
- Depth
- Bait Type
- Sediment Type
- *Temperature*

Traps:

- Trap Configuration
- Lobster and Bycatch Count

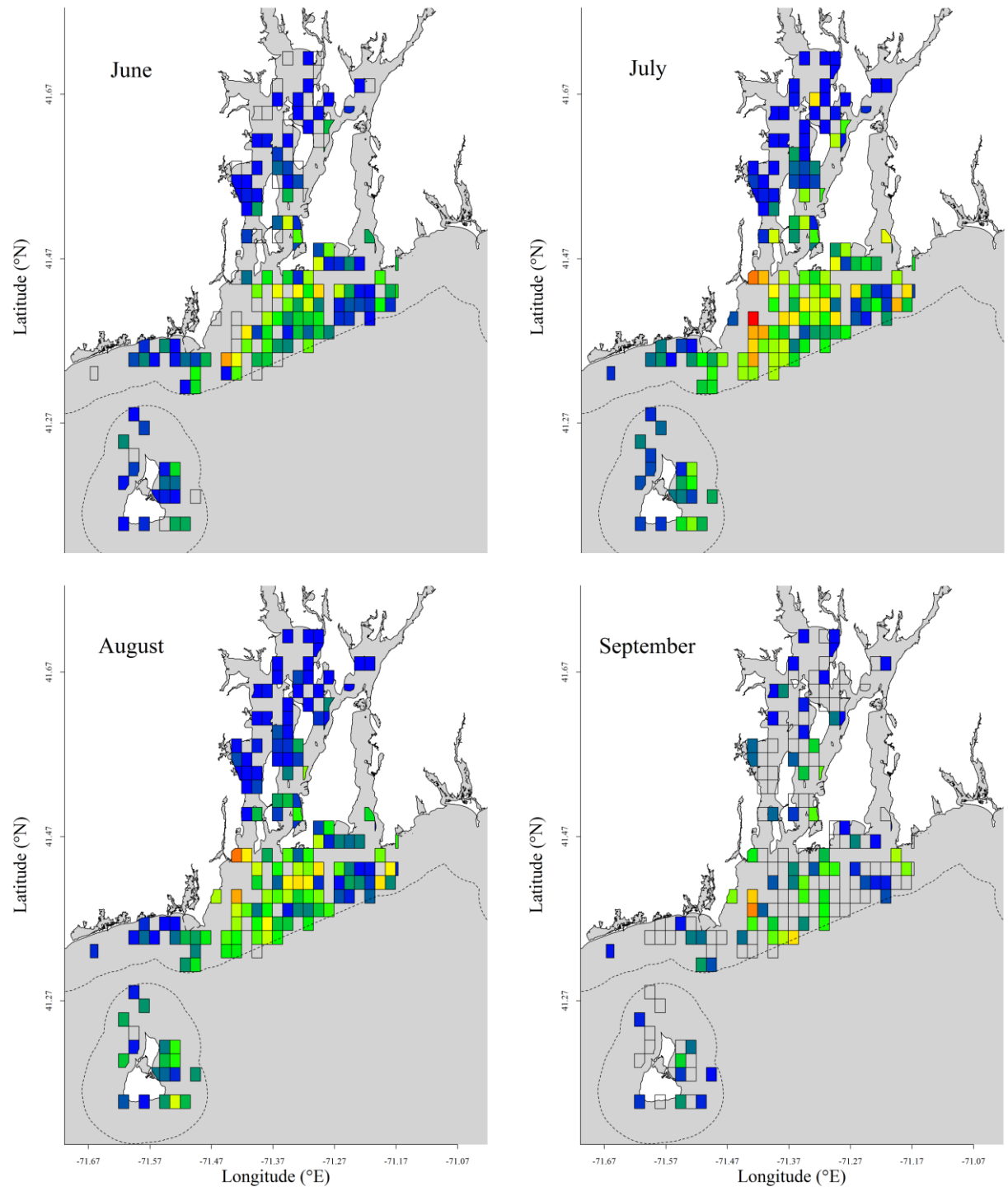
Data Collection

Individuals:

- Lobster
  - Size
  - Sex
  - Egg Stage
  - Shell Disease
  - Cull
  - Shell Hardness
  - V-Notch
- Crabs
  - Size
  - Sex
- Fish
  - Size

http://mlcalliance.org

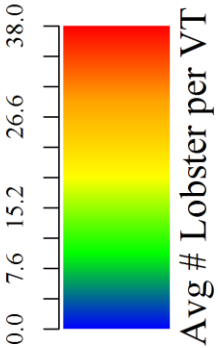
Barbara Somers



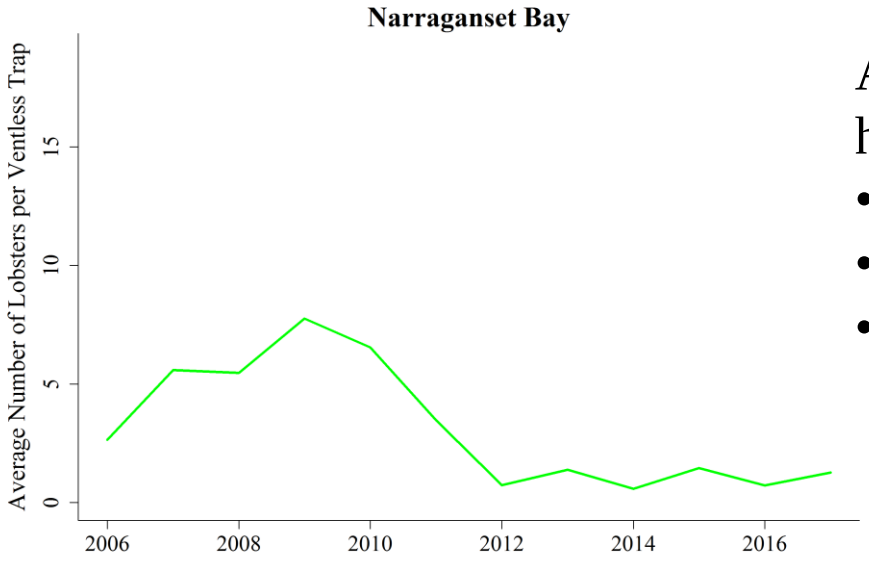
Average Catch per Ventless Trap

Abundances generally greater in July and August than June.

Highest abundances outside the mouth of Narragansett Bay.

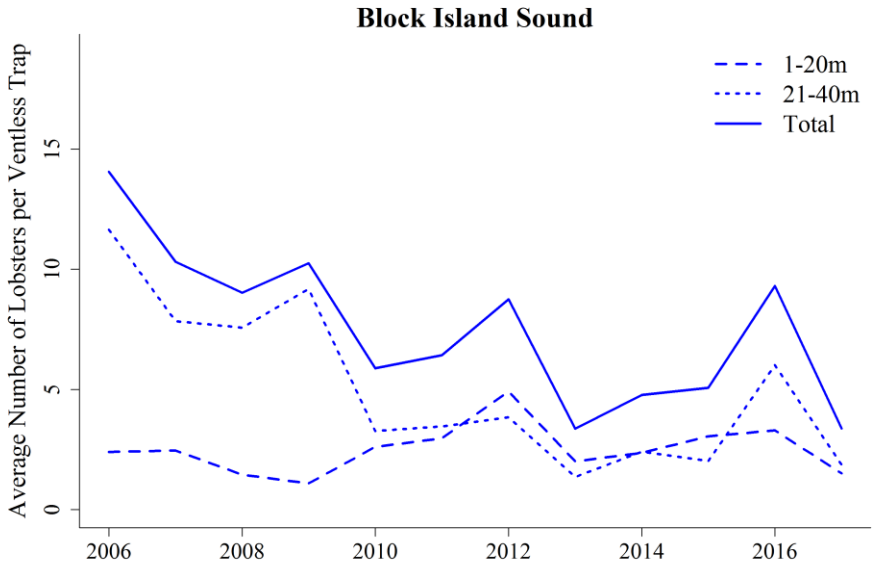


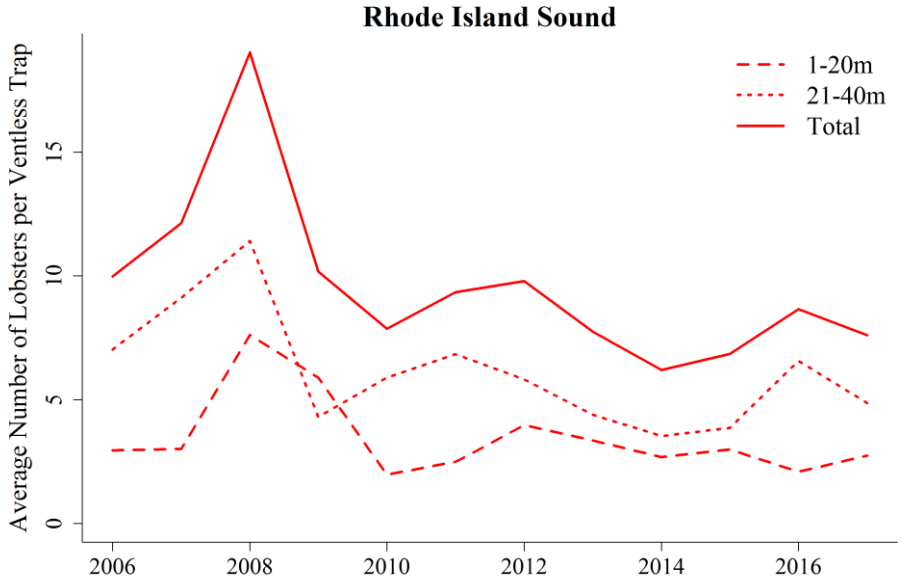
Standardized Catch Per Unit Effort and Trends



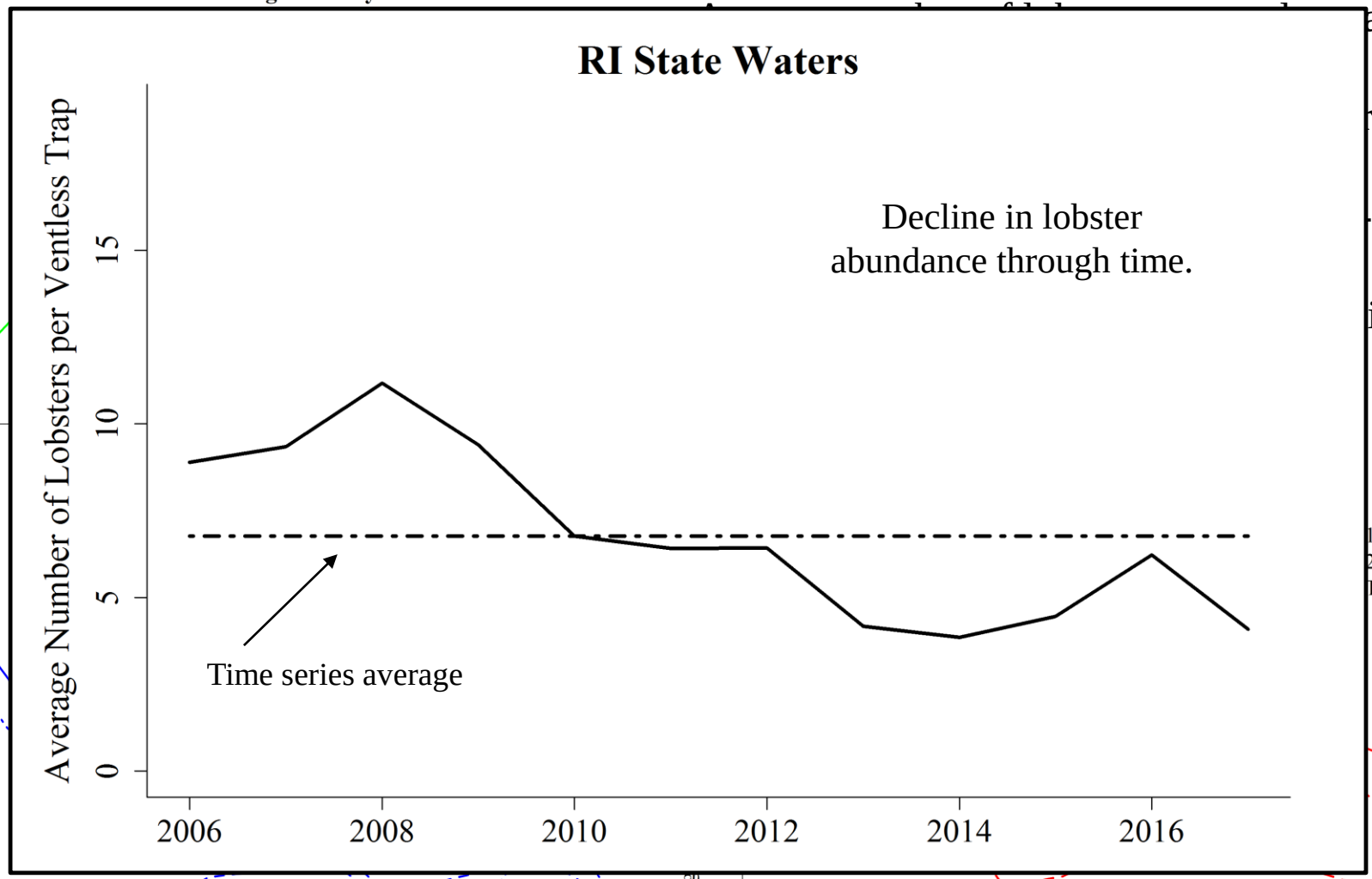
Average number of lobster per ventless trap have declined since 2006:

- NB decline from 2010-2012
- BIS and RIS declines in 21-40m strata
- Lobster abundance greatest currently in RIS

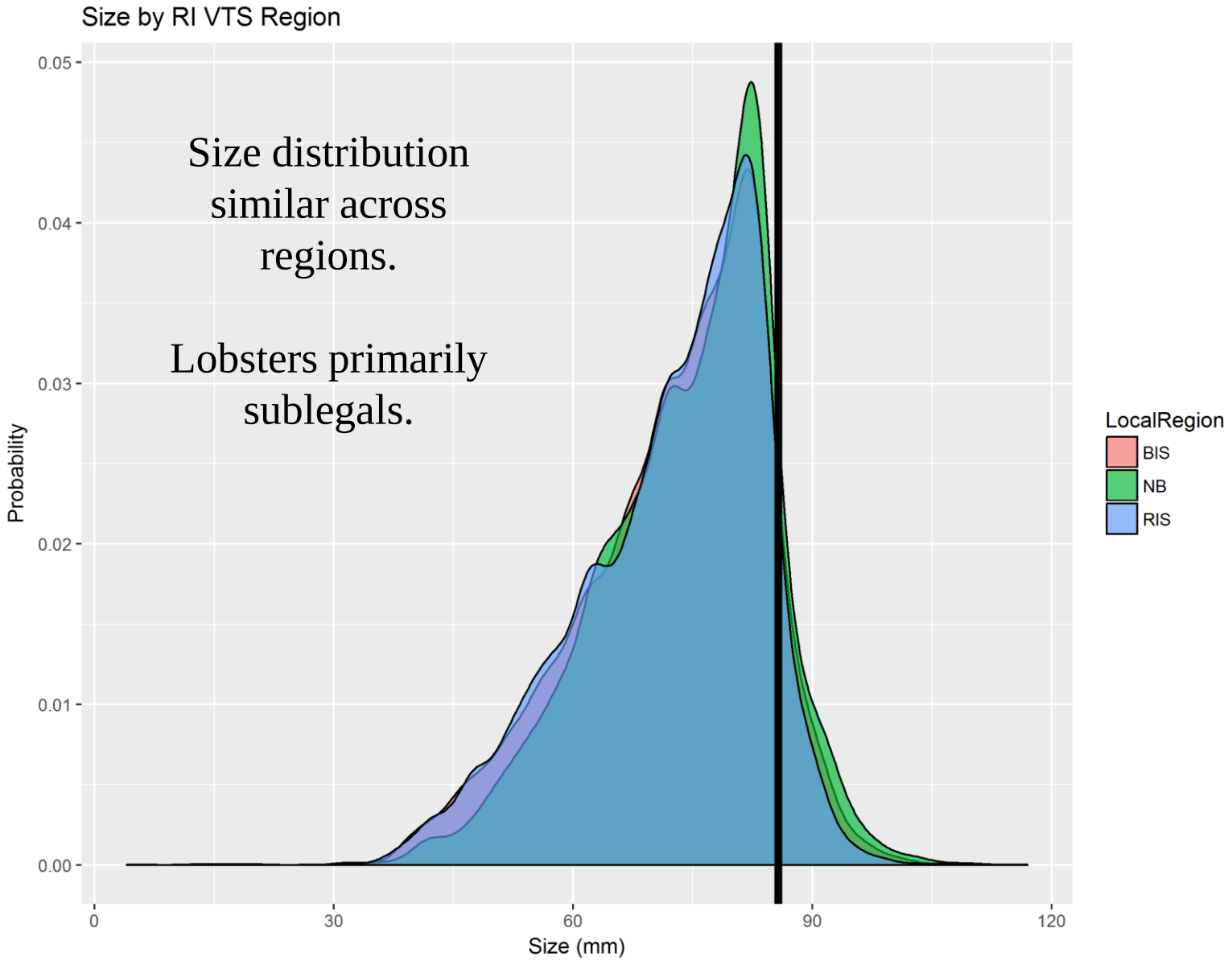




Lobster Abundance Trends



Lobster Condition: Size

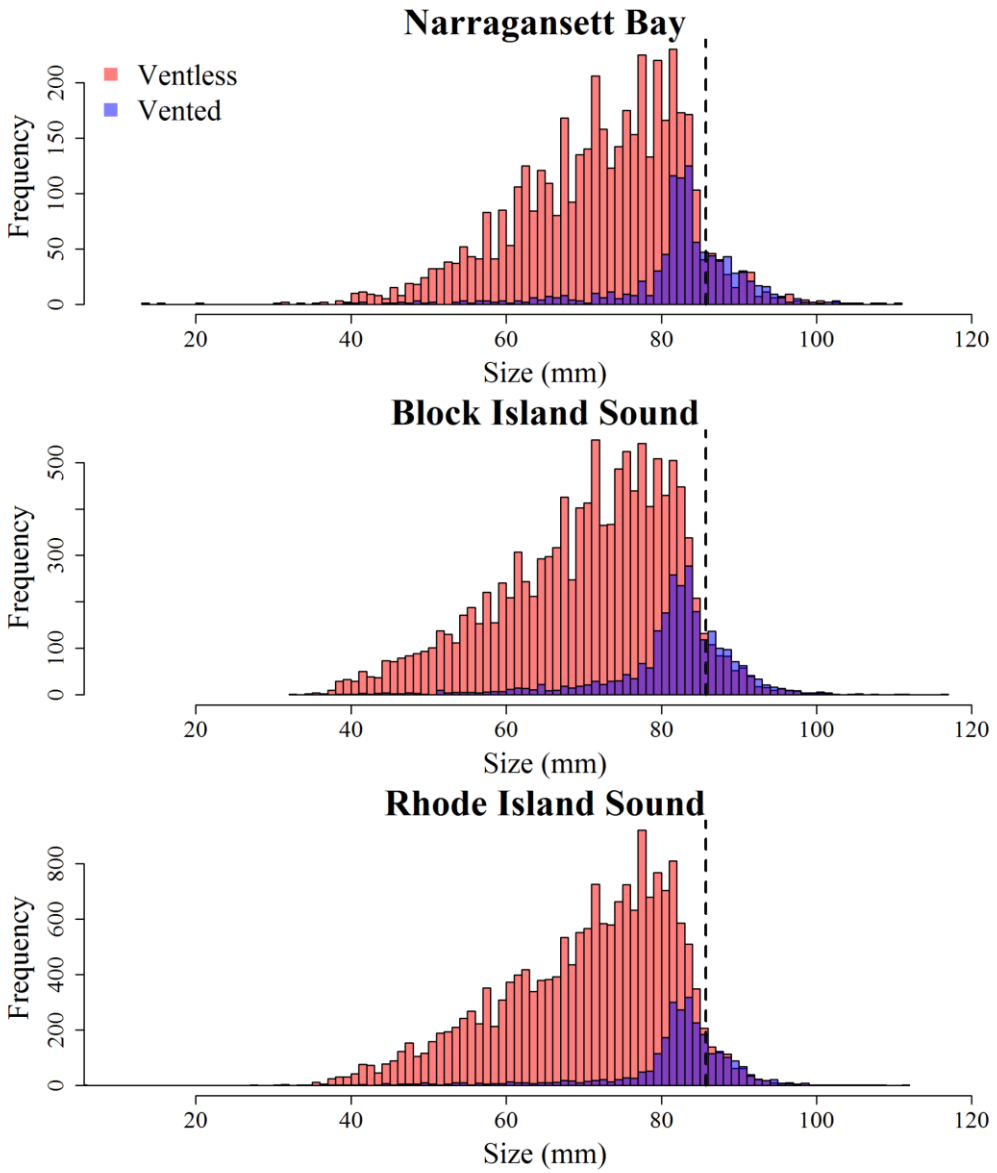


Vented vs. Ventless Traps: Size

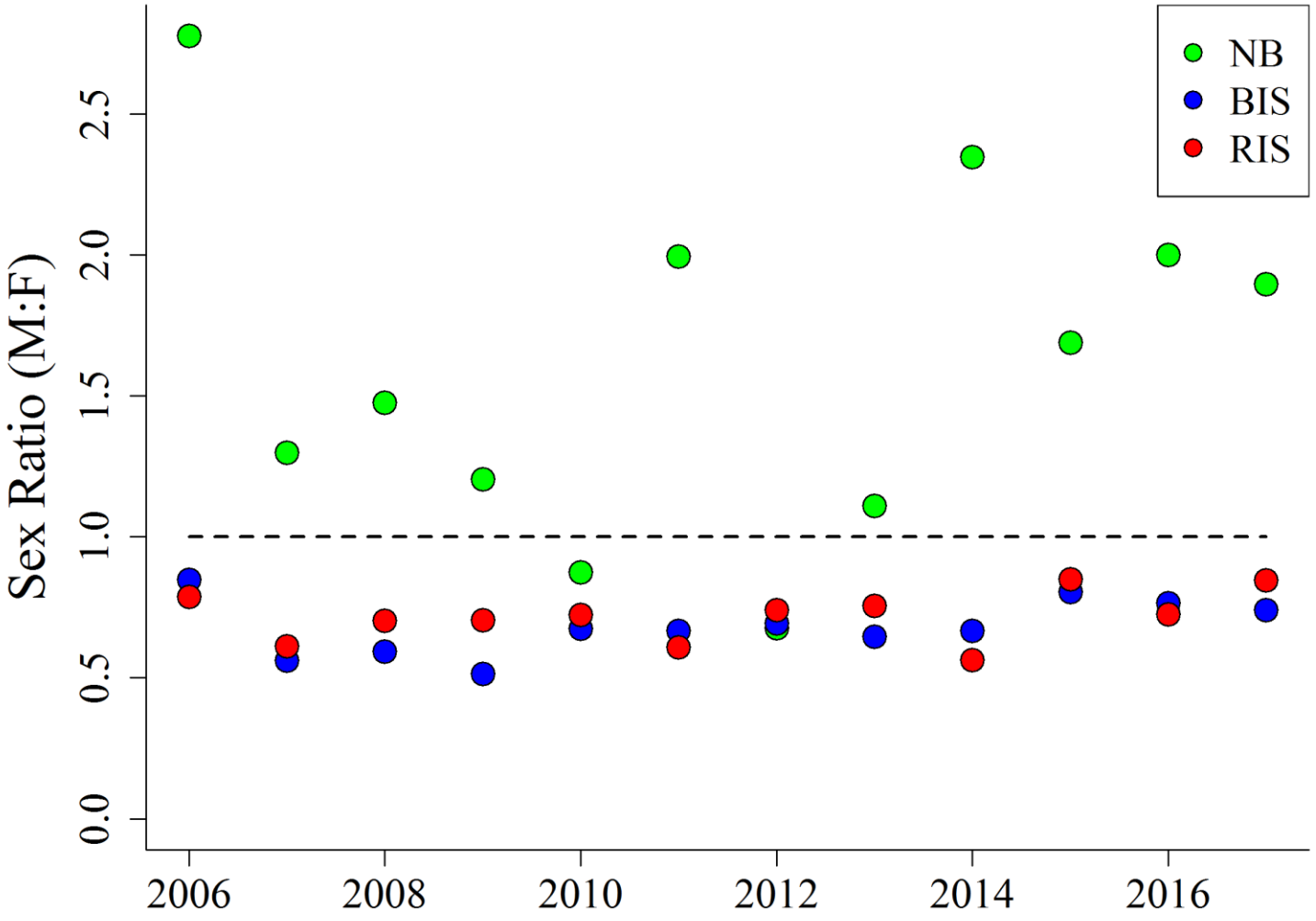
As expected, the vented traps catch far-fewer sublegal lobsters than vented traps.

Ventless and vented traps appear to catch similar size ranges of legal lobsters.

Distributions of ventless size ranges are similar across regions.



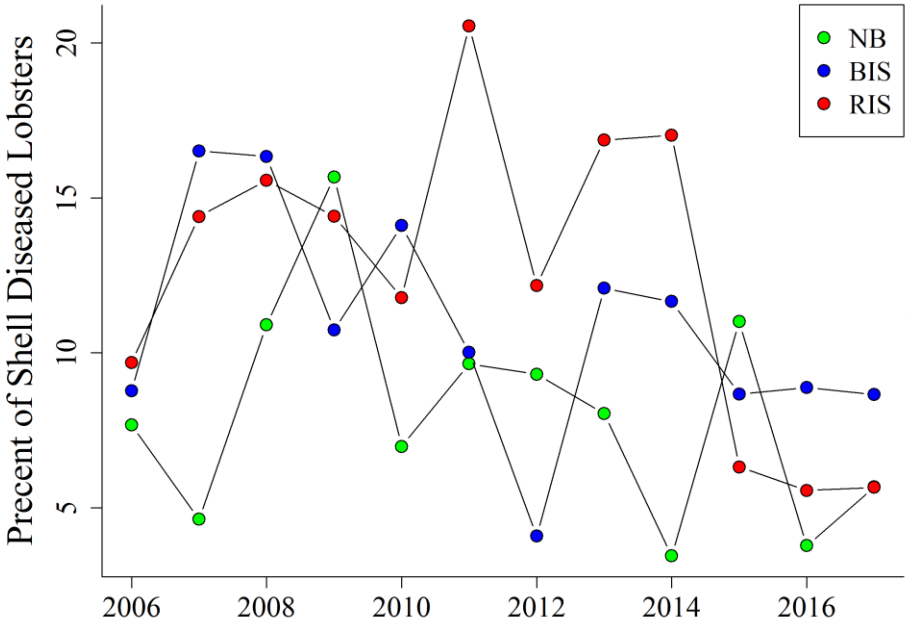
Lobster Condition: Sex Ratio

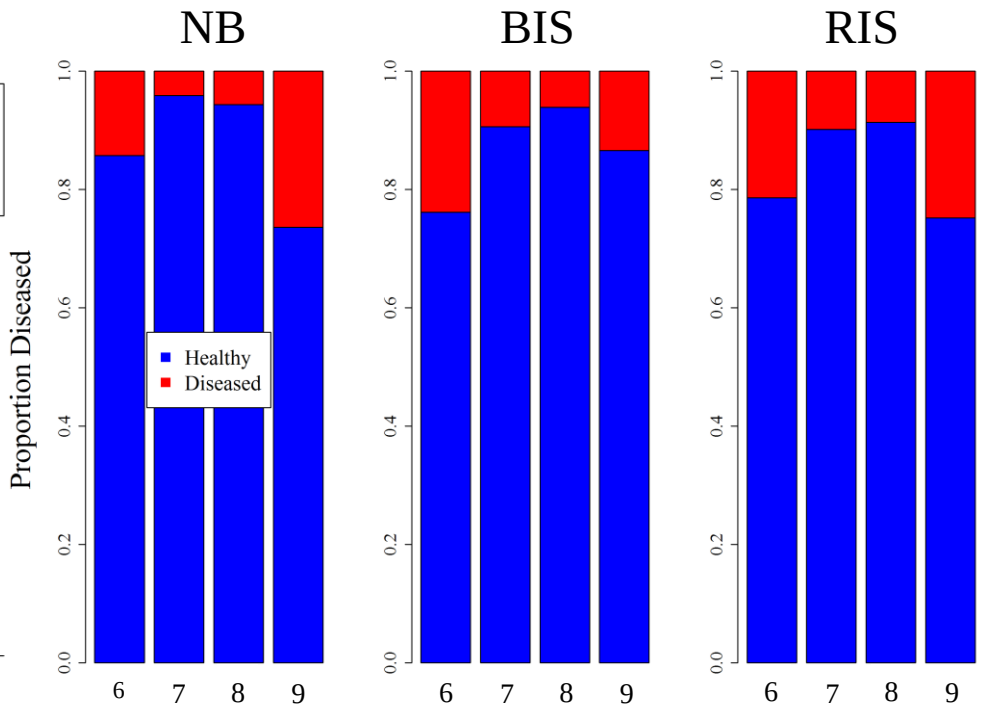


More males typically in in Narragansett Bay than females.

More females outside of the Bay than there are males.

Lobster Condition: Shell Disease Prevalence

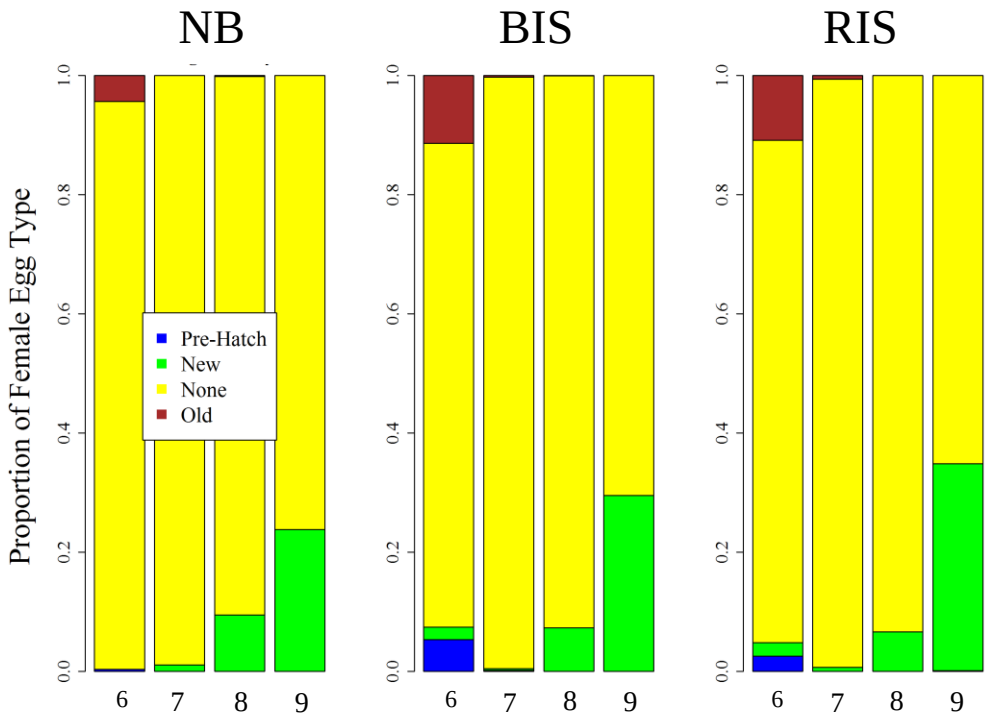


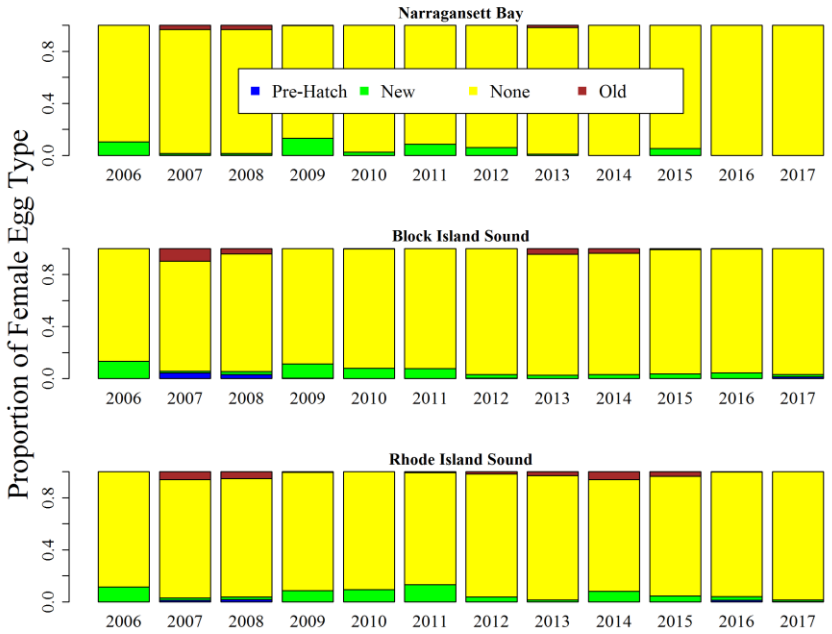


Disease variable through time and region (at most just over 20%).

Disease greatest in June and September.

Lobster Condition: Egg Stage





June is most common month to see old eggs or those soon to be released.

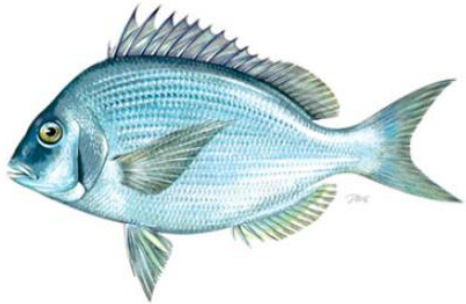
New egg prevalence then increases from July through September.

No discernable trends in specific egg stages through time.

Common Bycatch in VTS Survey

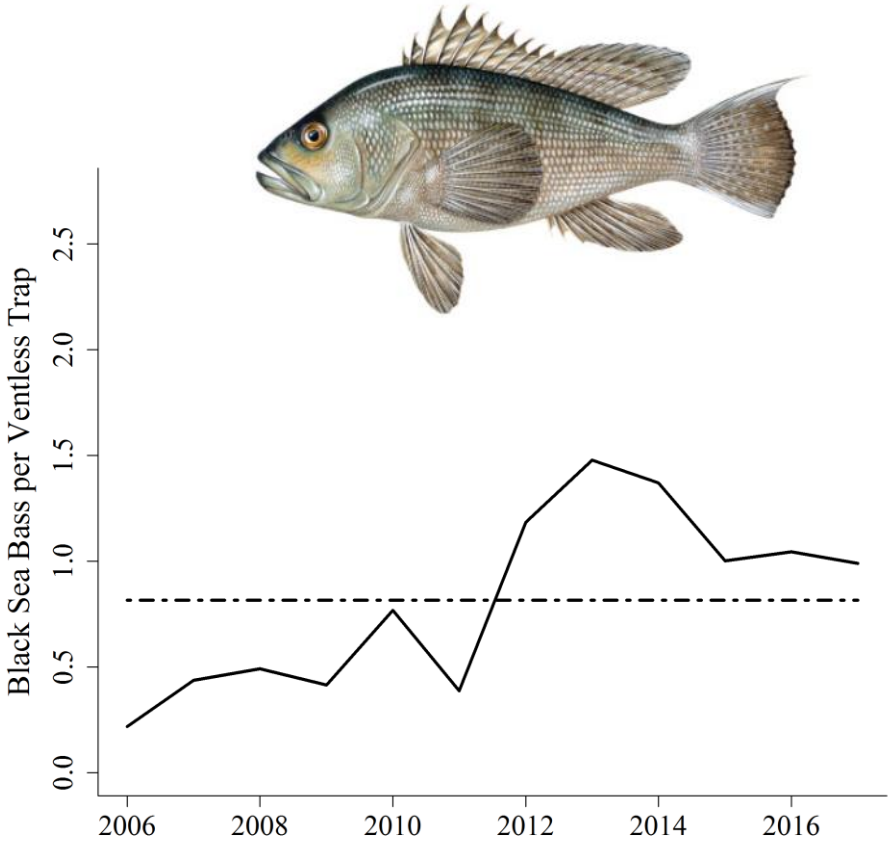
Top Species

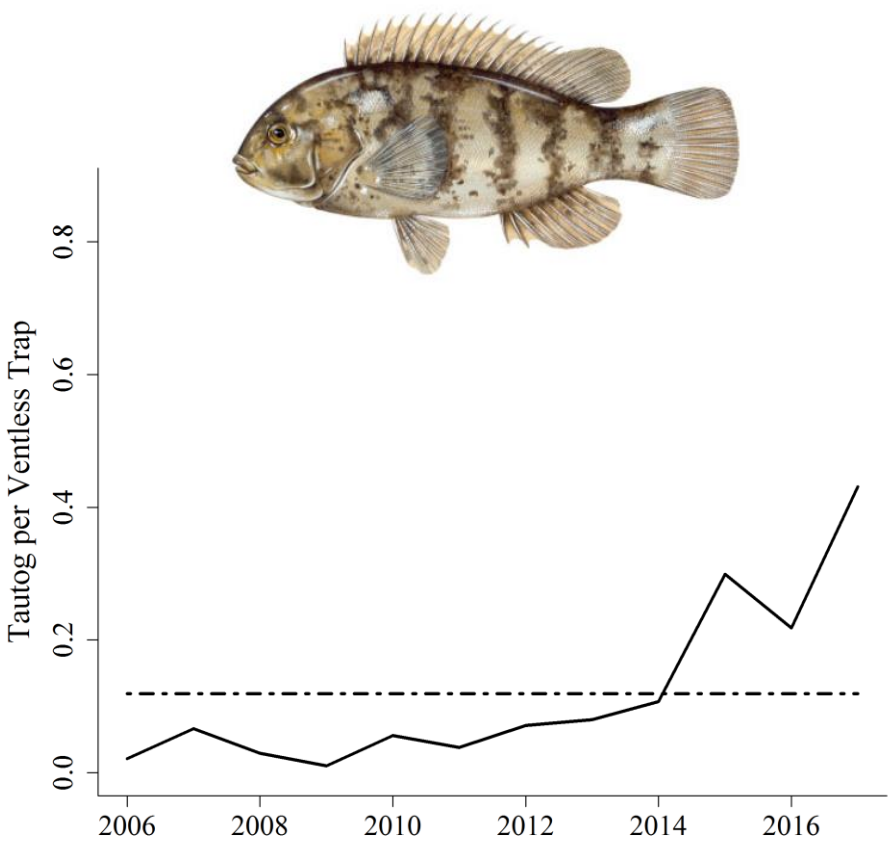
Black Sea Bass
Tautog
Scup
Jonah Crab
Rock Crab
Conger Eel
Cunner
Channeled Whelk
Oyster Toadfish
Sea Raven
Red Hake
Triggerfish



Animations: ASMFC, MA DMF

RI Black Sea Bass and Tautog Trends





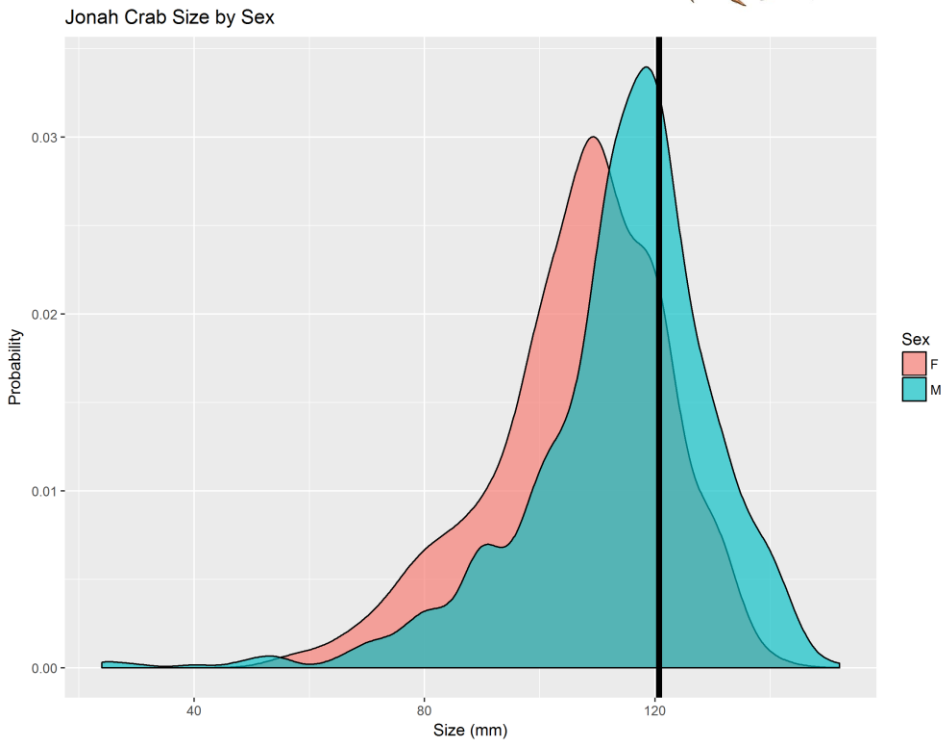
RI average abundances for Black Sea Bass and Tautog have increased recently.

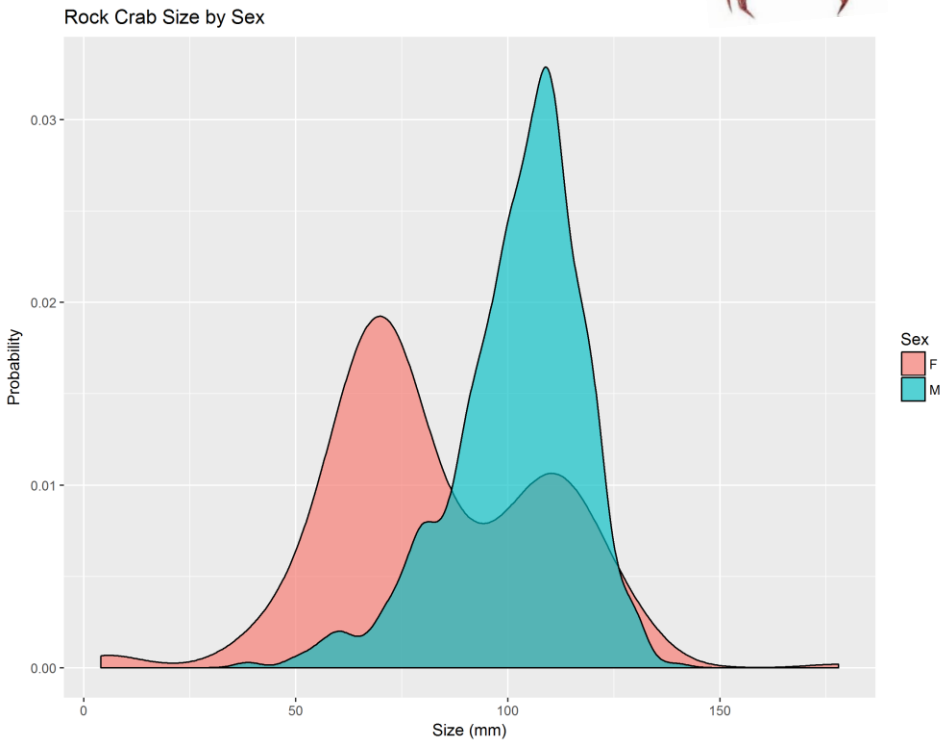
Animations: ASMFC

RI Crab Trends

Animations: ASMFC, MADMF

RI Crab Size Distributions



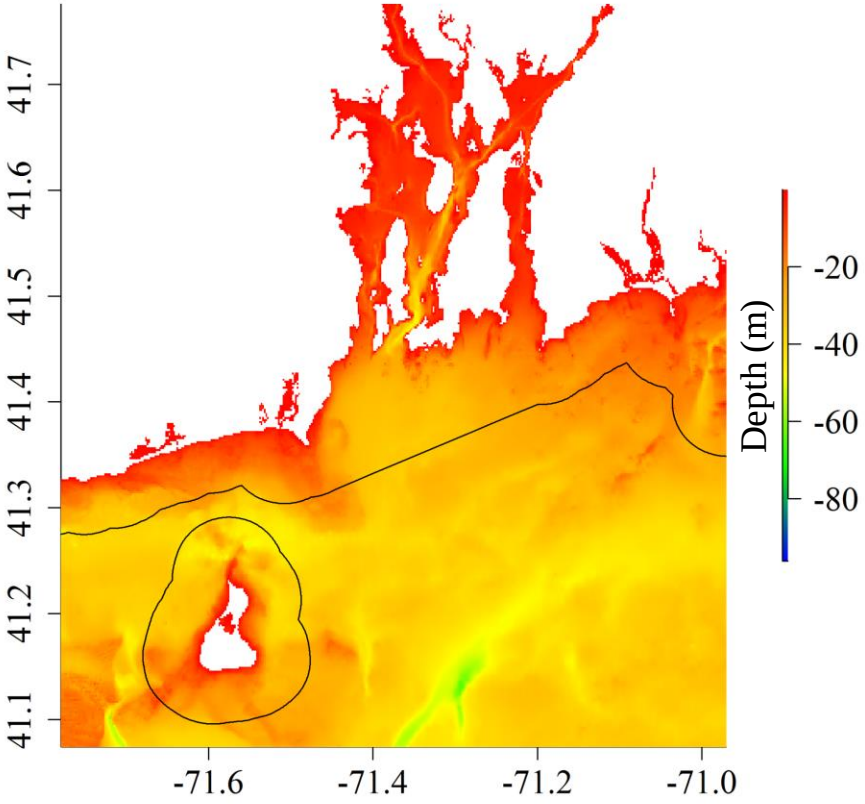


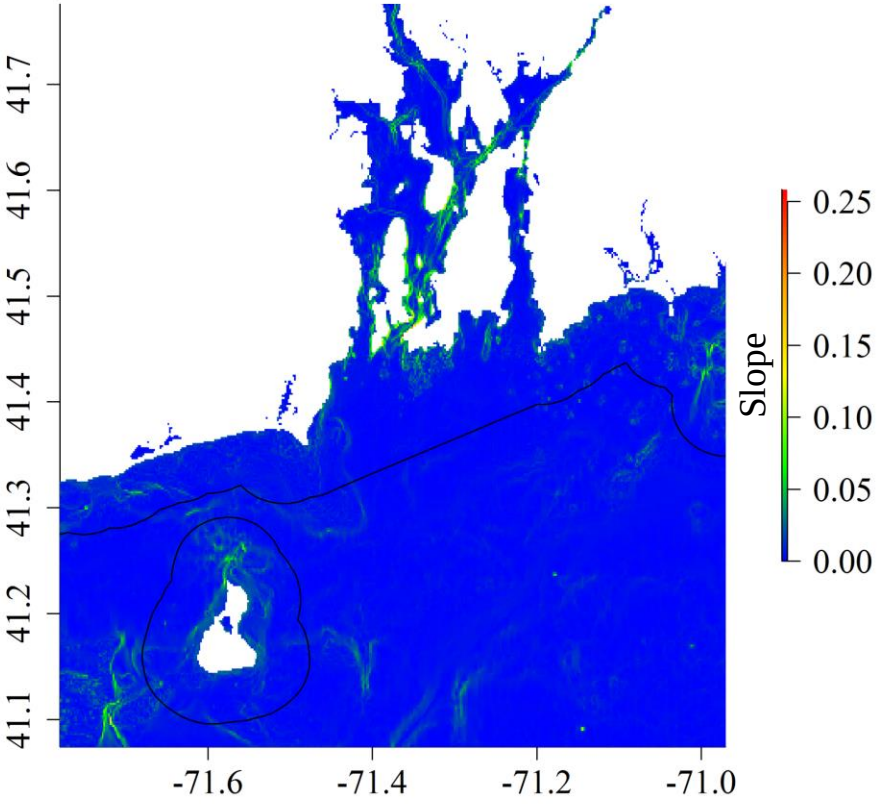
Jonah Crab size distributions similar by sex, but females are smaller. Majority of males and females caught are under the minimum size.

Stronger sexual dimorphic signal in size for Rock Crabs than Jonah Crabs from the RI VTS.

Coupling External and VTS Data

Combining VTS and other data sources can expand the application of the survey's use, such as species distribution modeling.

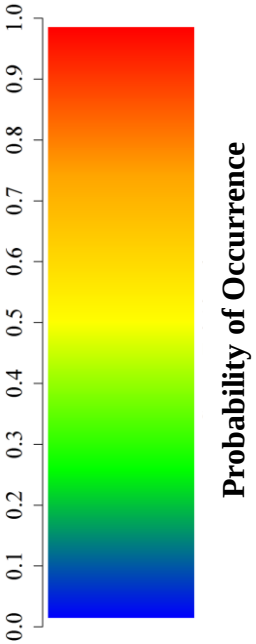


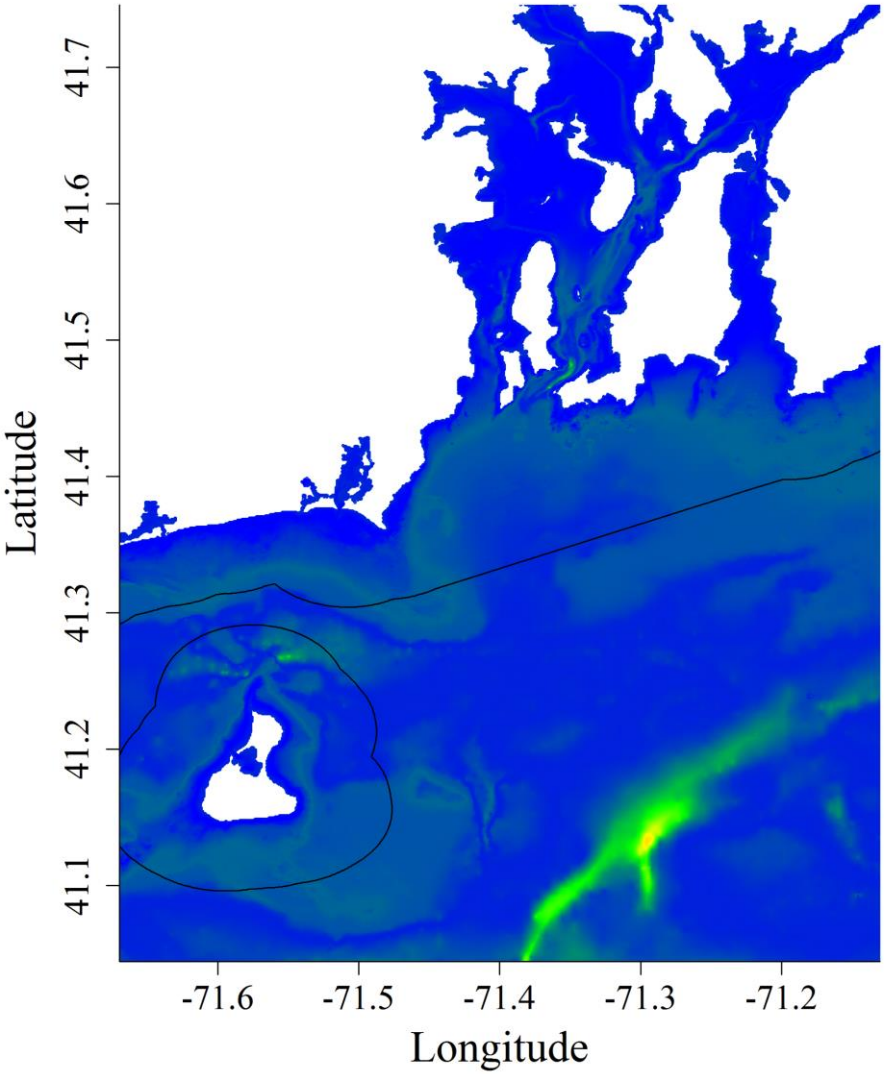


An Example: Predicting Conger Eel Presence

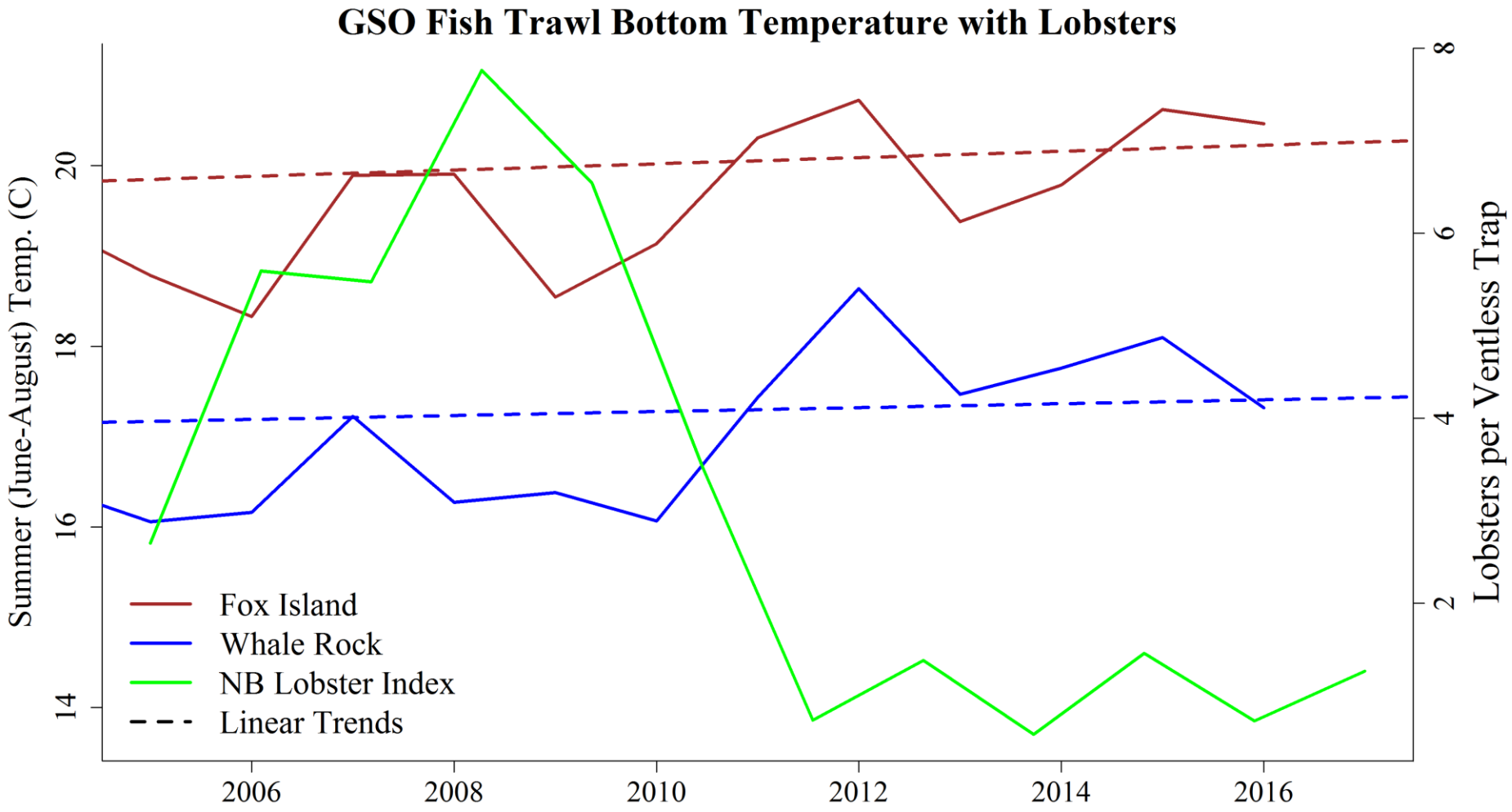
Ex: Binomial GAM

Conger Eel Presence ~ Depth + offset(Soak Time)





Correspondence Between Temperature and Lobsters?



Acknowledgements

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