

Lower Edisto River Basin and Marine Resources Monitoring

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An aerial photograph of a coastal town. A large, vibrant green field dominates the left side of the frame. To the right, a body of water is visible, with a long pier extending into it. Several buildings, including a large multi-story structure, are scattered throughout the town. The overall scene is captured from a high angle, showing the layout of the town and its proximity to the water.

SCDNR Marine Resources Research Institute

Mission: Conduct research and monitoring programs to assess the condition of our coastal resources and provide data required to address policy and management issues related to those resources

Presentation Roadmap

Inshore Fisheries Research Section

Trammel Net Survey

COASTSPAN Survey

Electrofishing Survey

Adult Red Drum & Longline Survey

Crustacean & Mollusk Research Section

Oyster demographic project

Estuarine Trawl Survey

Environmental Research Section

South Carolina Estuarine and Coastal Assessment Program (SCECAP)





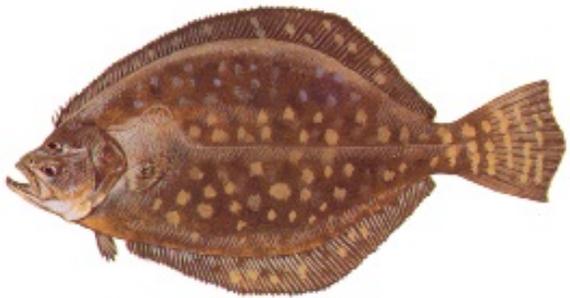
SCDNR Inshore Fisheries Research Section

Two Primary Species Interest Groups

Estuarine Finfish



Spotted Seatrout



Southern Flounder

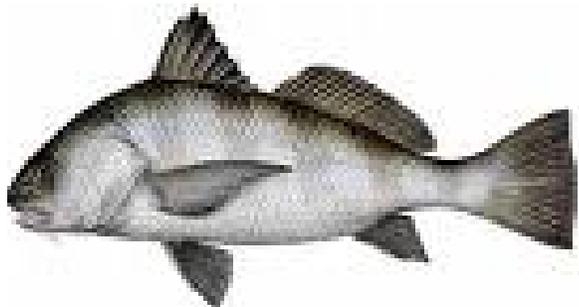


Two Primary Species Interest Groups

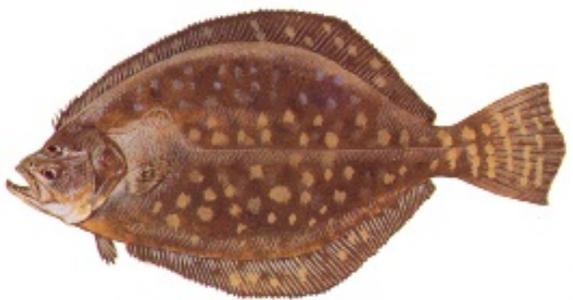
Estuarine Finfish



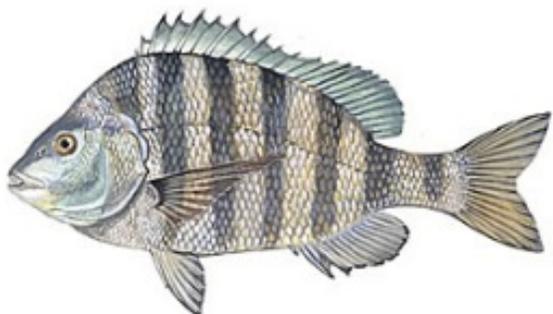
Spotted Seatrout



Black Drum



Southern Flounder



Sheepshead

Small and Large Coastal Sharks



Atlantic Sharpnose



Sand Tiger Shark



Scalloped/Carolina Hammerhead



Bull Shark



Tiger Shark



Trammel Net Survey

Sampling areas

Lower estuary, salt-marsh edge habitats

Five target estuarine systems – Port Royal Sound, **ACE Basin**, Charleston Harbor, Cape Romain, and Winyah Bay

Target species

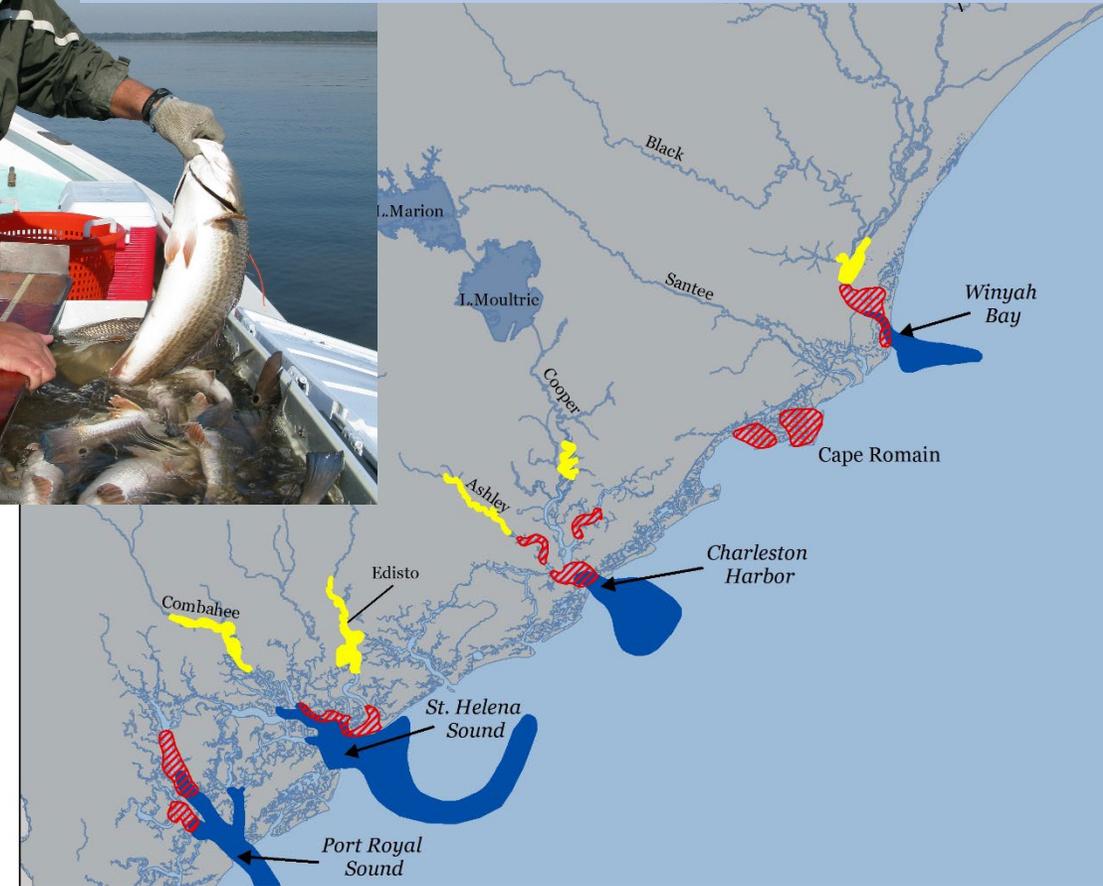
Red Drum, Spotted Seatrout, Spot, Southern Flounder, Atlantic Croaker, and Black Drum

>120 species encountered

>400,000 organisms encountered



Measuring, tagging and releasing red drum caught by the trammel net survey in Port Royal Sound.



Trammel Net Survey

Quarterly sampling in PRS since 2010

Monthly sampling in other strata to as early as 1991

Coastal Shark Survey (COASTSPAN)

Sampling gear

Monofilament gill net (755' x 10')

Longlines (1000', 50 hooks/set)

Drum lines (20/0 hooks)

Target Species are coastal sharks

Bonnethead, Scalloped Hammerhead, Atlantic Sharpnose, Finetooth, Sandbar, Blacktip, Lemon and Bull Sharks



After being measured and tagged, a bull shark is readied for release.



Seasonally (April-Sept.) from 1998-present

Electrofishing Survey

Sampling areas

Brackish (salinity < 8 ppt) upper estuarine creeks and riverbanks

Five target rivers

Combahee, **Edisto**, Ashley, Cooper and Sampit/Waccamaw Rivers

Target species

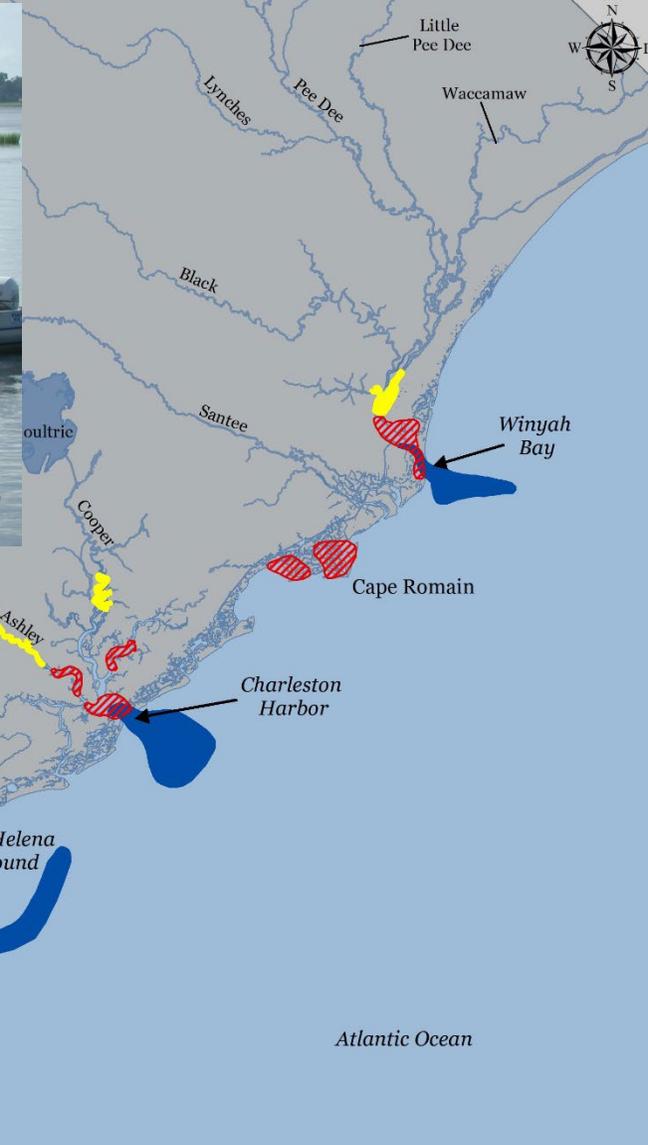
Red Drum, Southern Flounder, Spot, American Eel, Atlantic Croaker, and Spotted Seatrout

>100 species encountered

~ 450,000 organisms encountered



Electrofishing in the Ashley River



Electrofishing

Monthly sampling since May 2001

5-6 sites/mo/stratum

Adult Red Drum & Shark Longline Survey

Sampling gear:

1/3 mile monofilament longlines,
40 hooks/set

Habitat:

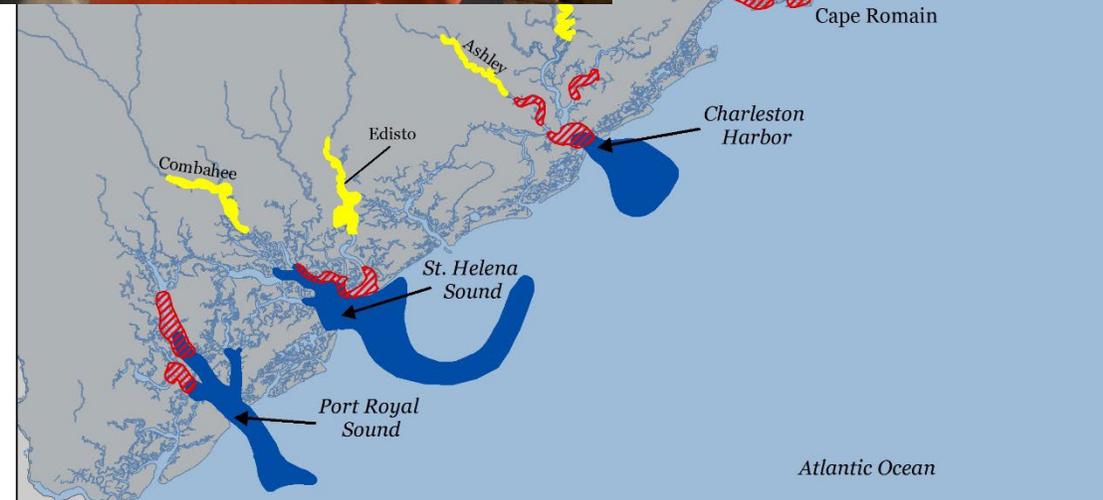
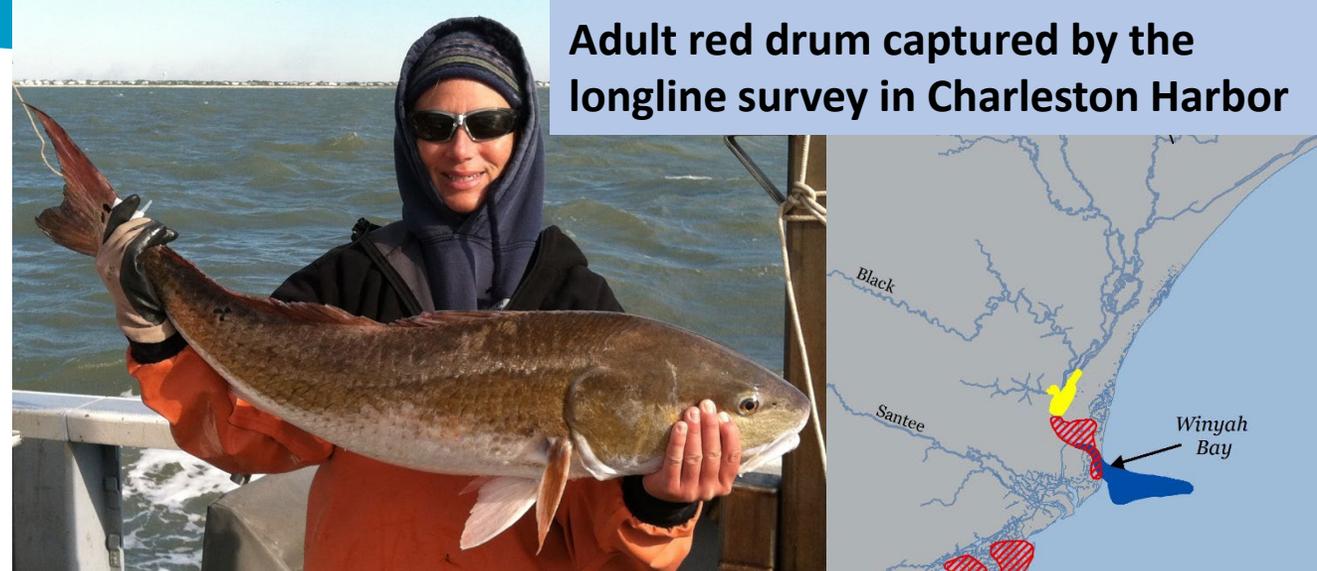
Channels at the entrances of estuaries and adjacent near-shore waters

Port Royal Sound, St. Helena Sound, Charleston Harbor, and Winyah Bay

Target species: Adult Red Drum and coastal sharks

> 50 species encountered

> 1,500 animals caught per year



Adult Red Drum & Shark Longline Survey

Seasonal (late-summer/fall) since 2007

~360 sets/year

Processing of Captured Fish

Fish brought on board and when possible placed in live well

All fish identified and counted

Most fish measured to nearest mm

Some fish tagged

Red drum, black drum, sheepshead, southern flounder

Water conditions recorded

Tidal stage, water temp., salinity, dissolved oxygen

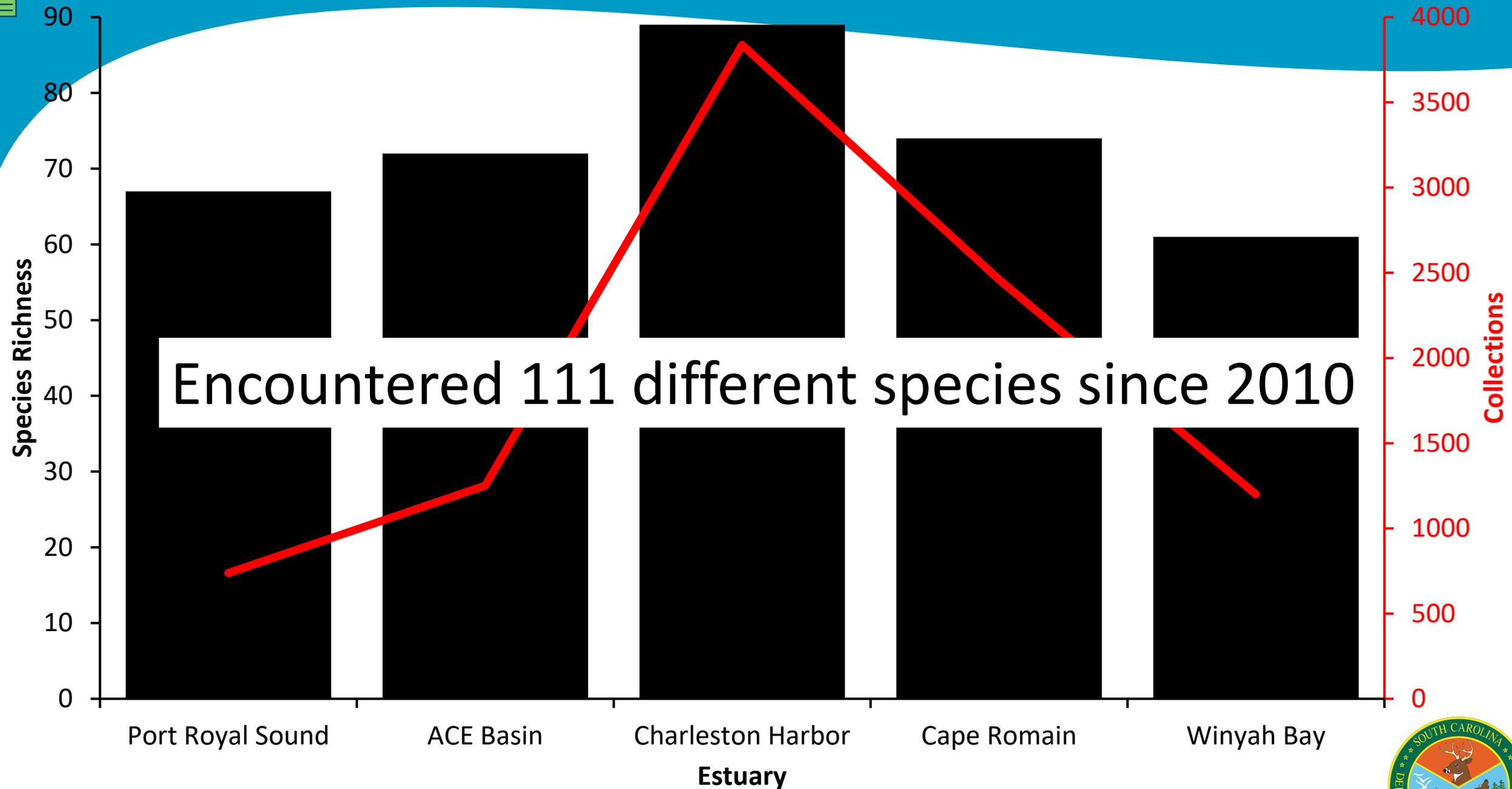


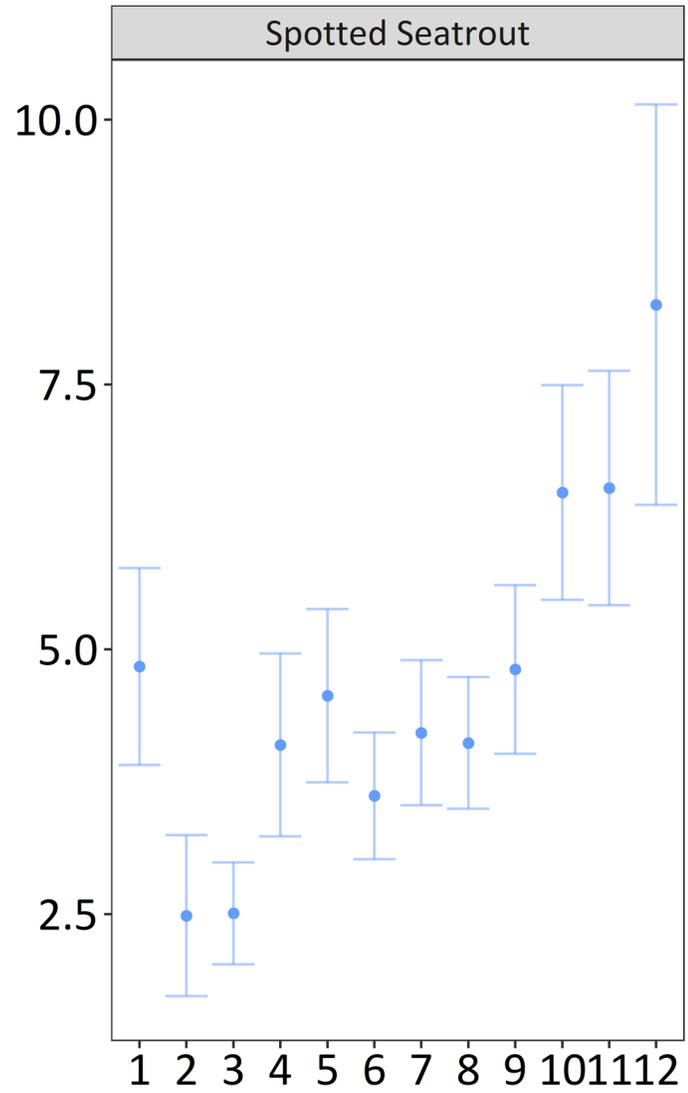
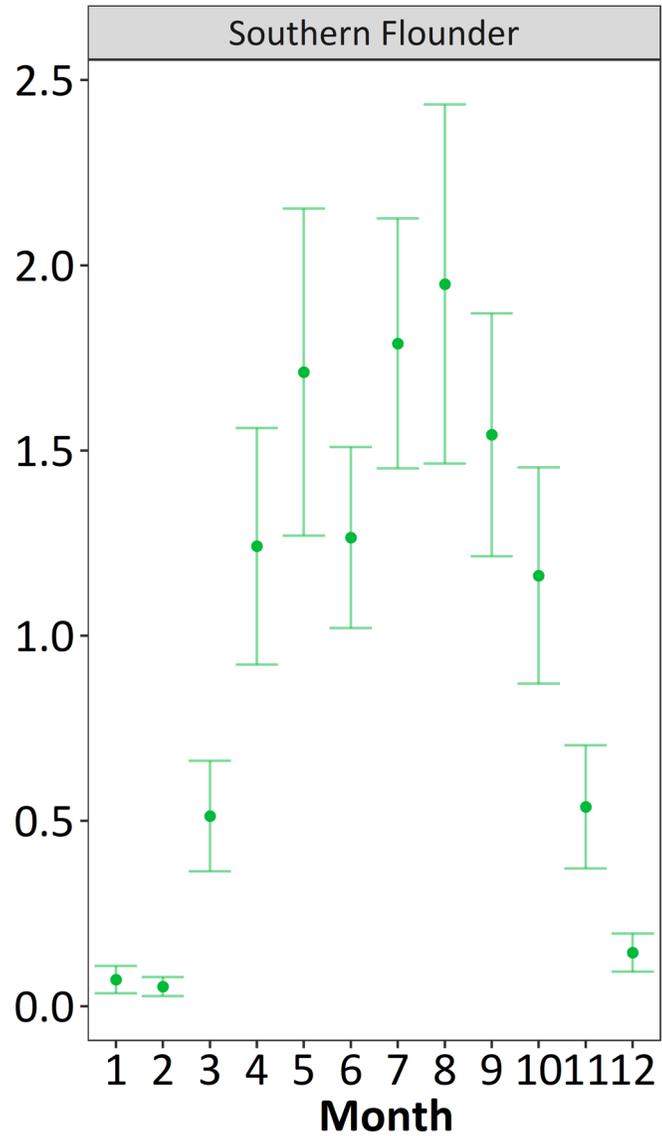
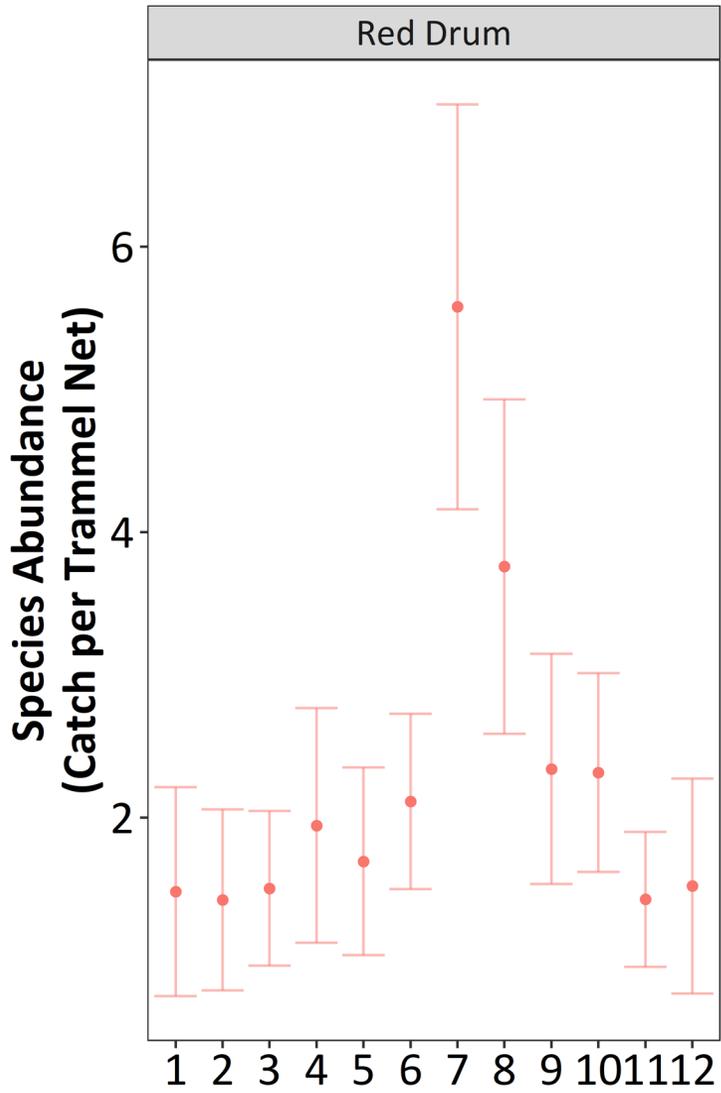


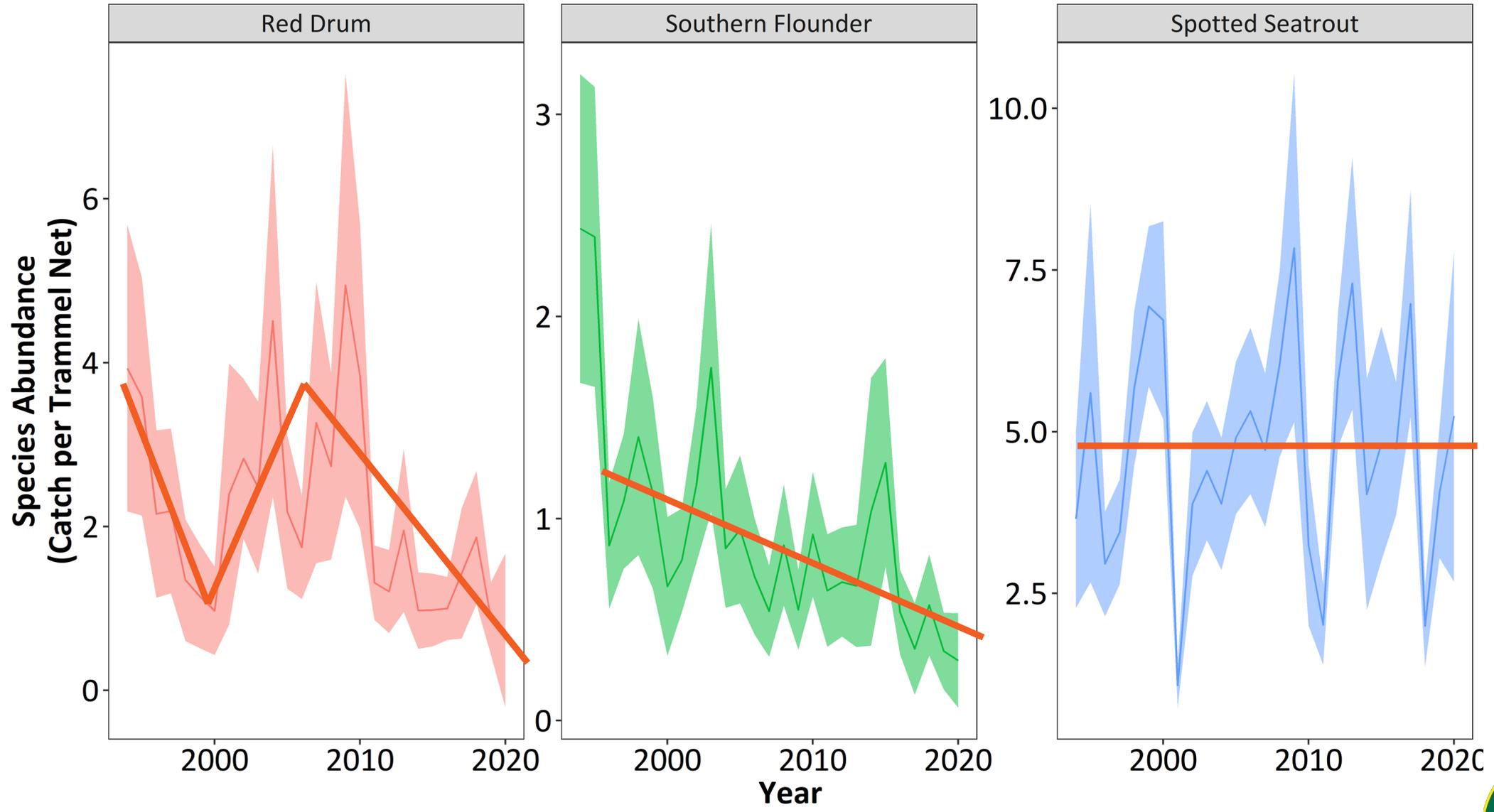
Some example data products

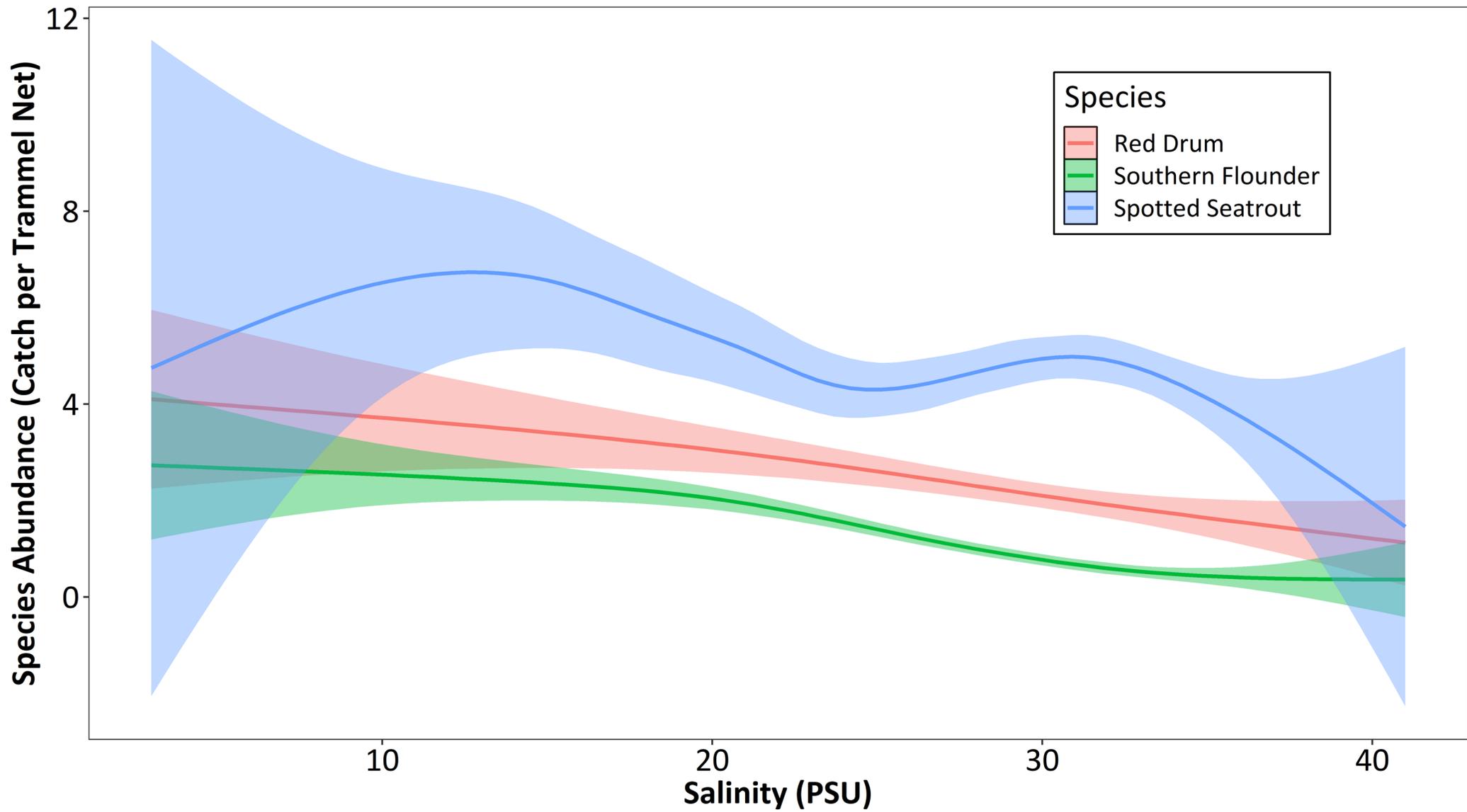
Trammel Net Survey and Longline Survey











Abundance of Data

Inshore fisheries has an abundance of data useful for looking at relationship between estuarine communities and environmental variables

Just provided a snapshot of the type of questions that could be investigated here, using some examples from the trammel net survey

Not fully investigated the relationship between survey abundance and environmental conditions to date

If there are specific questions, we are happy to investigate further

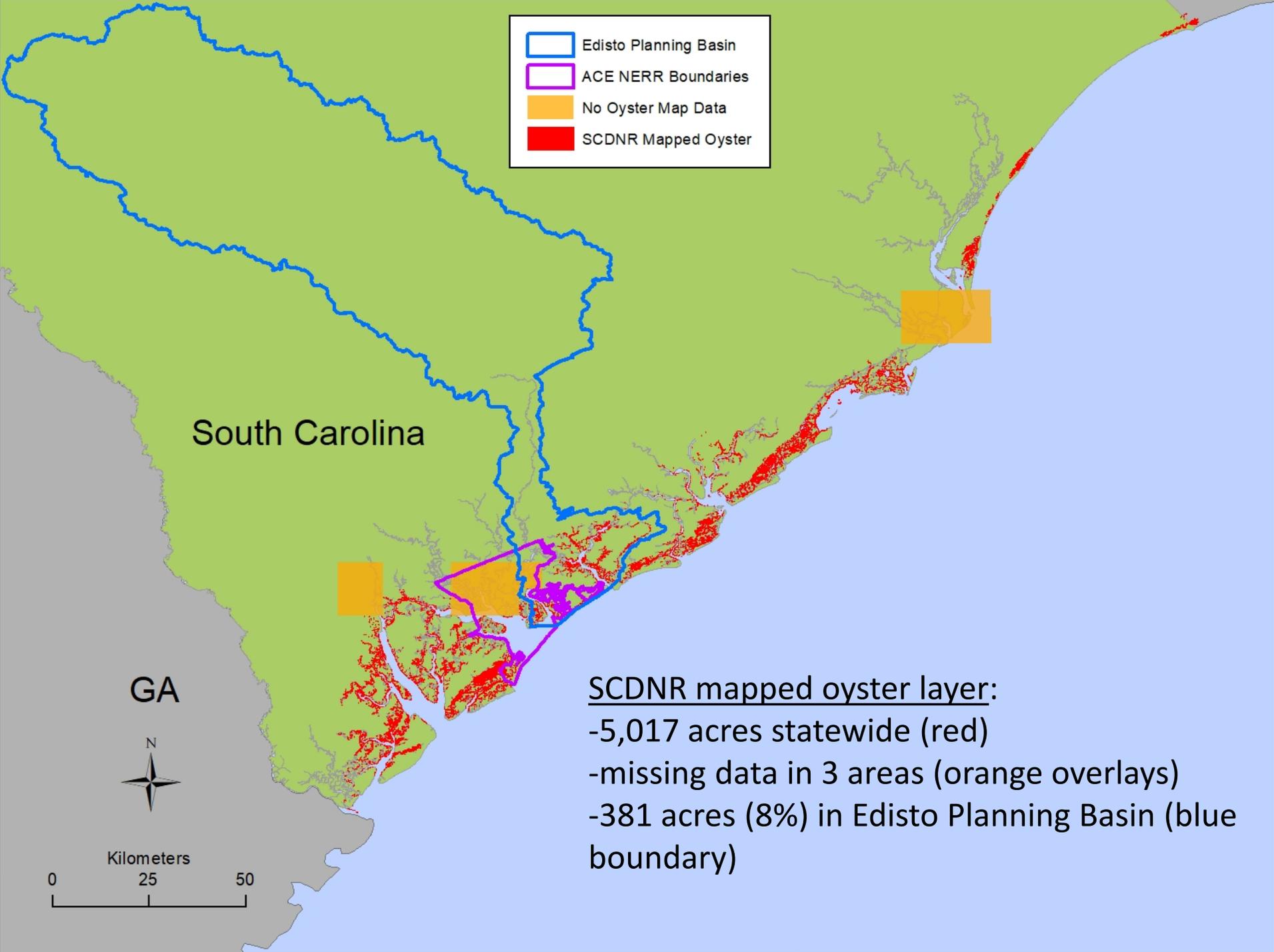


Crustacean & Mollusk Research Section

Oyster Demographics Project

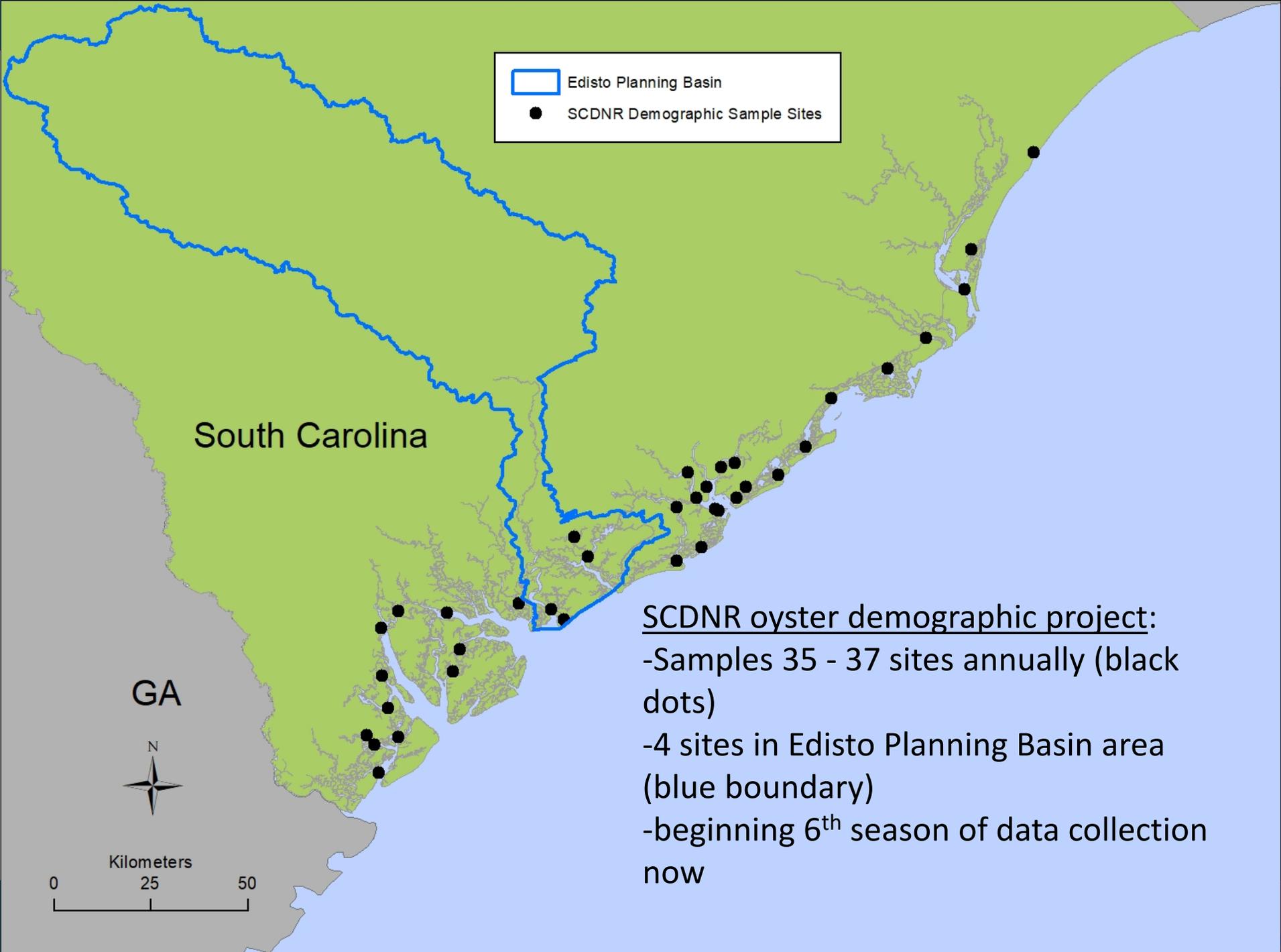


11/19/2020



SCDNR mapped oyster layer:
 -5,017 acres statewide (red)
 -missing data in 3 areas (orange overlays)
 -381 acres (8%) in Edisto Planning Basin (blue boundary)





SCDNR oyster demographic project:
-Samples 35 - 37 sites annually (black dots)
-4 sites in Edisto Planning Basin area (blue boundary)
-beginning 6th season of data collection now



Survey Methods

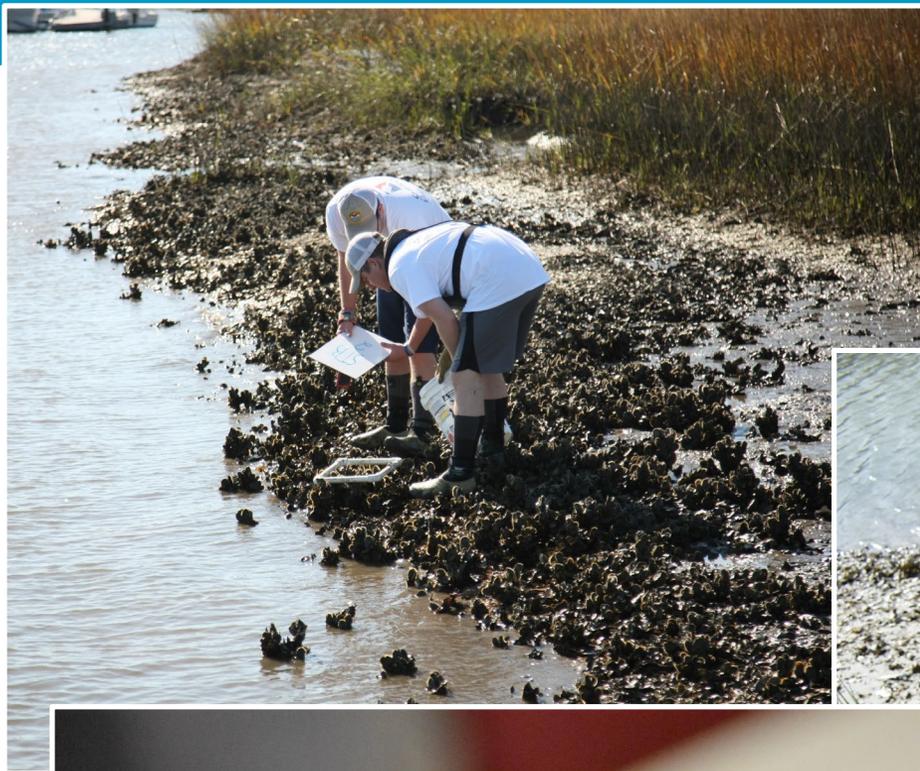
Collect representative oysters

Measure salinity, temperature, and dissolved oxygen

Assess oysters as living or “boxes”

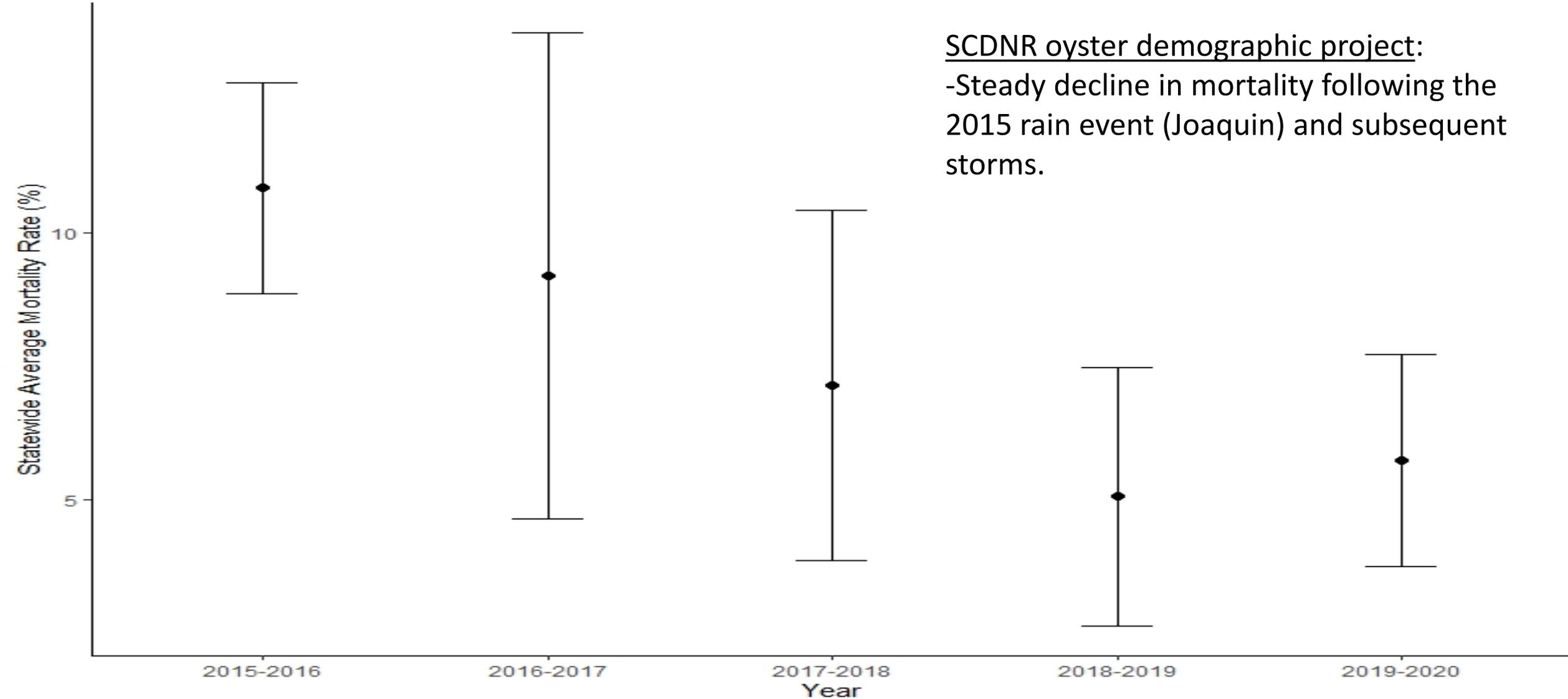
Measure all live oysters and boxes

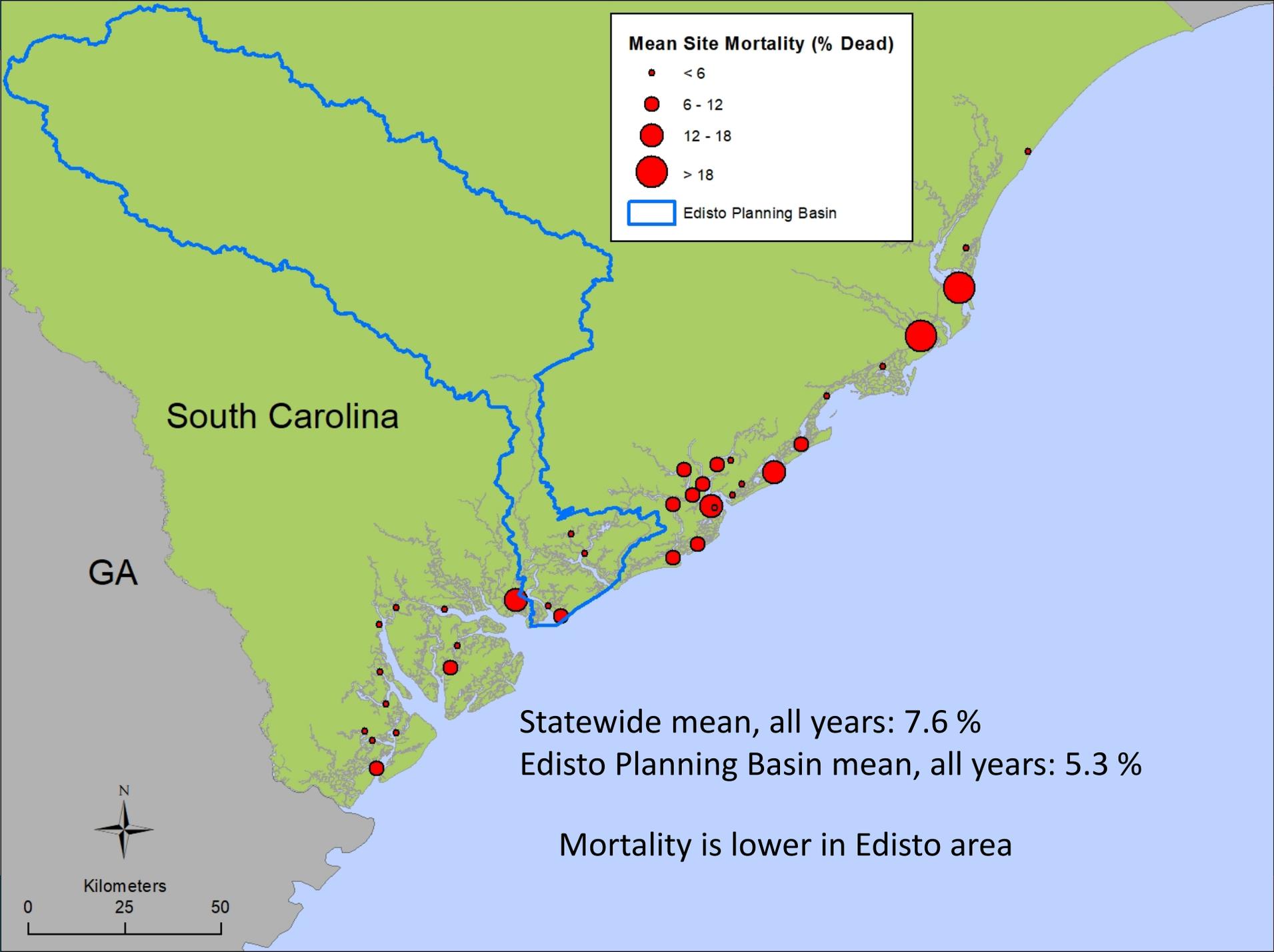


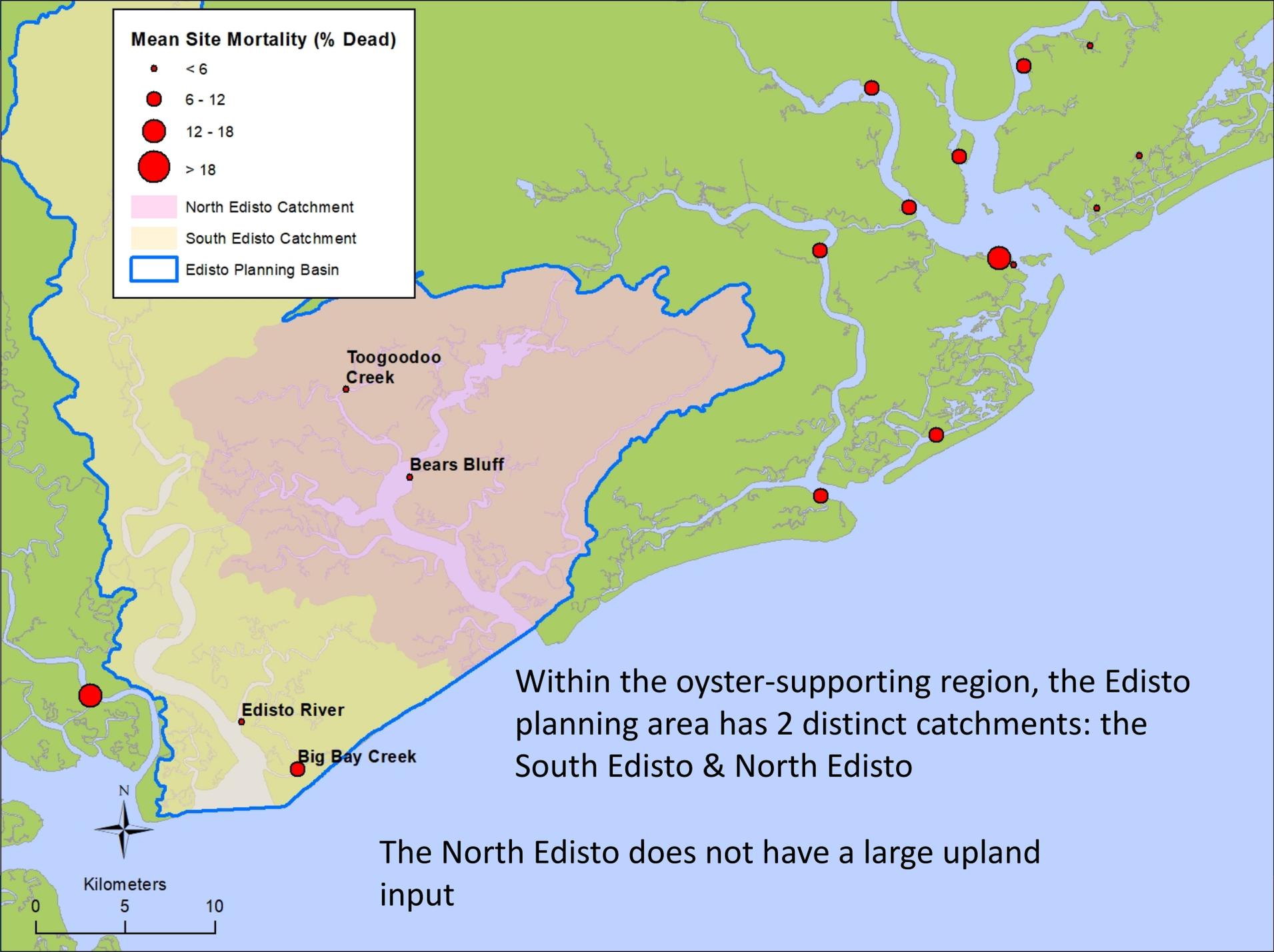


Statewide Average Natural Mortality

SCDNR oyster demographic project:
-Steady decline in mortality following the 2015 rain event (Joaquin) and subsequent storms.



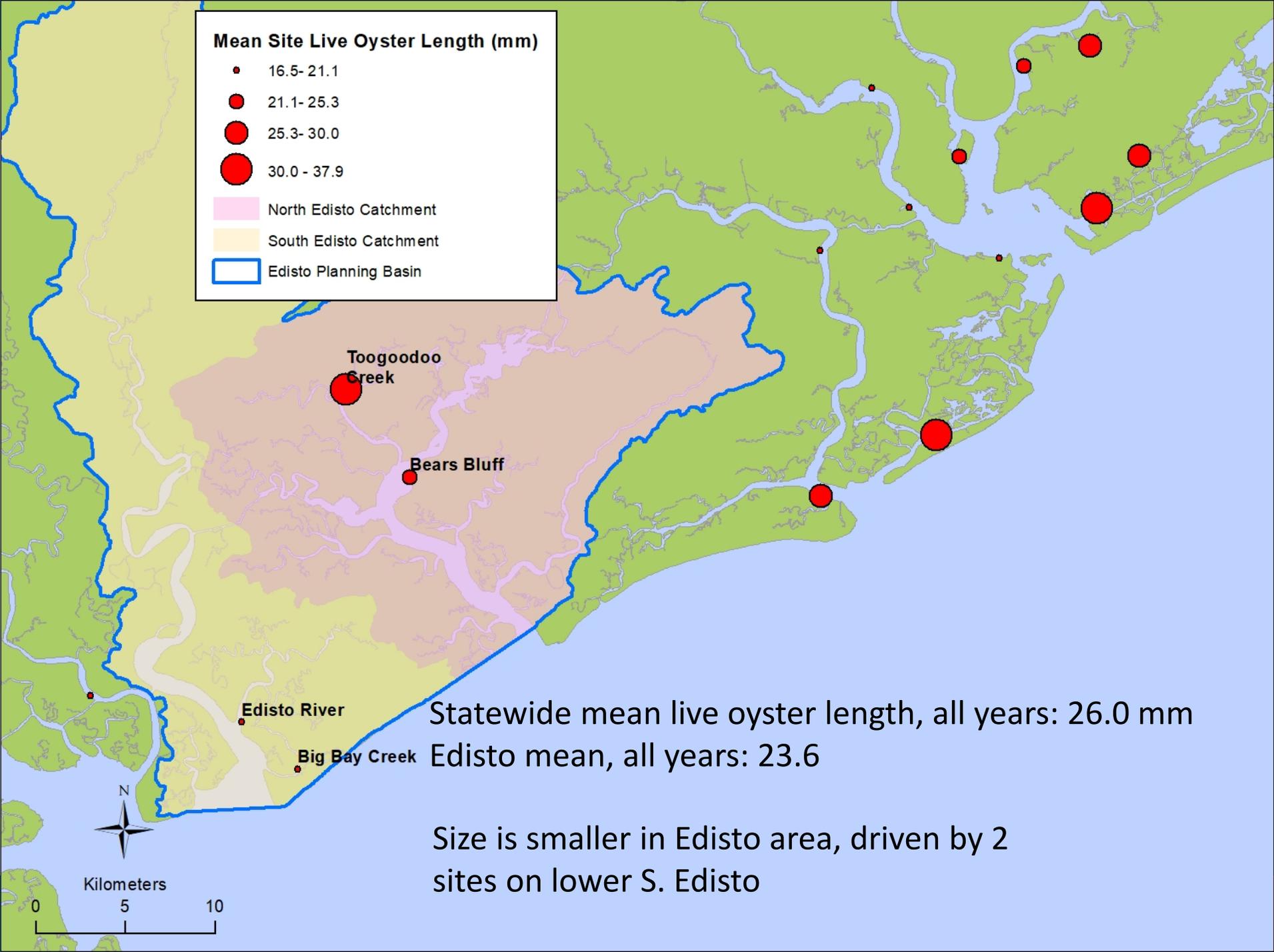


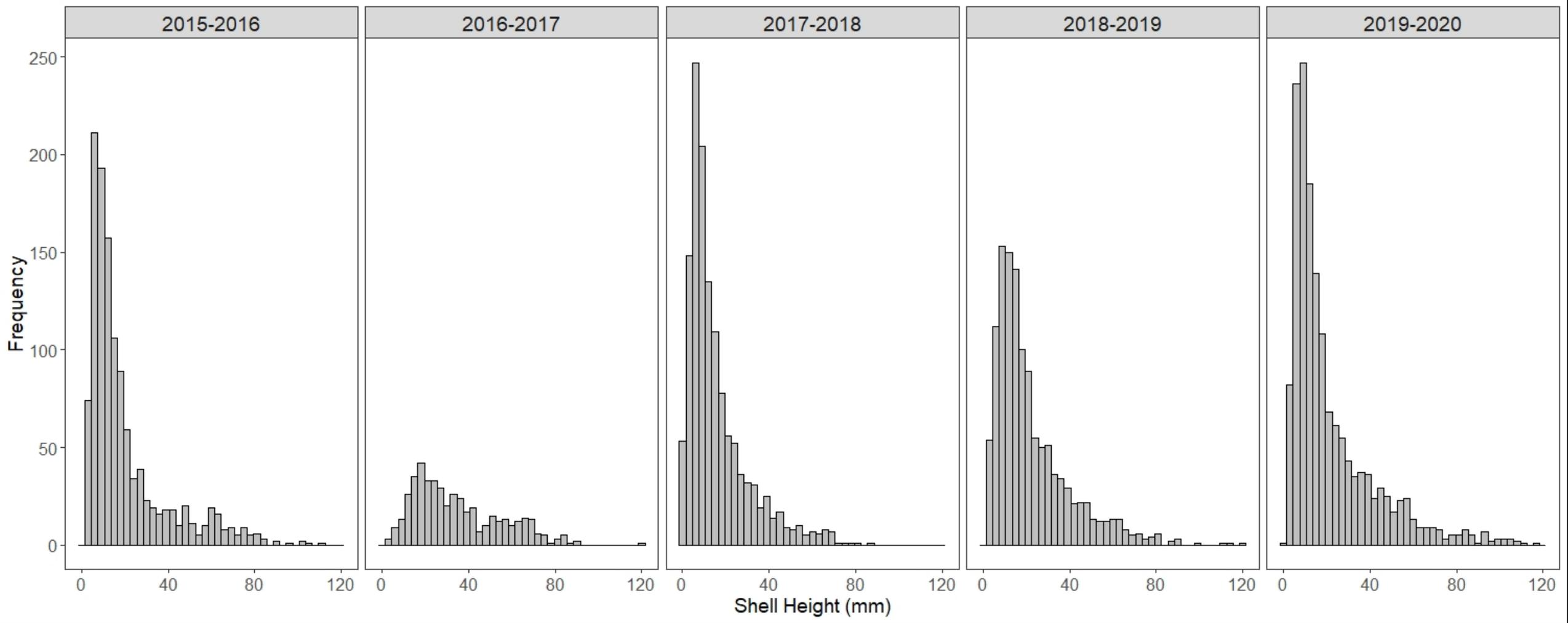


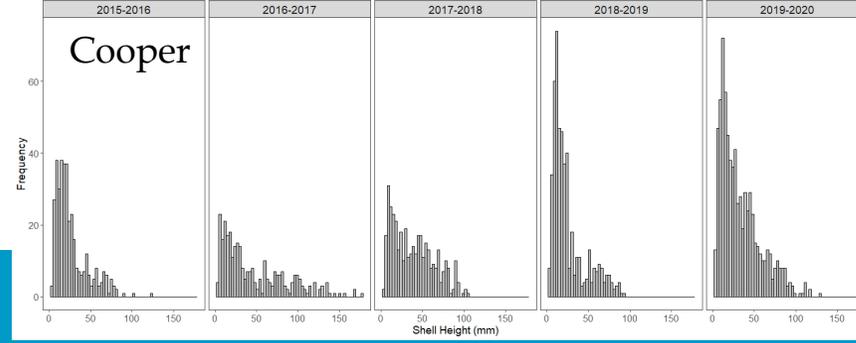
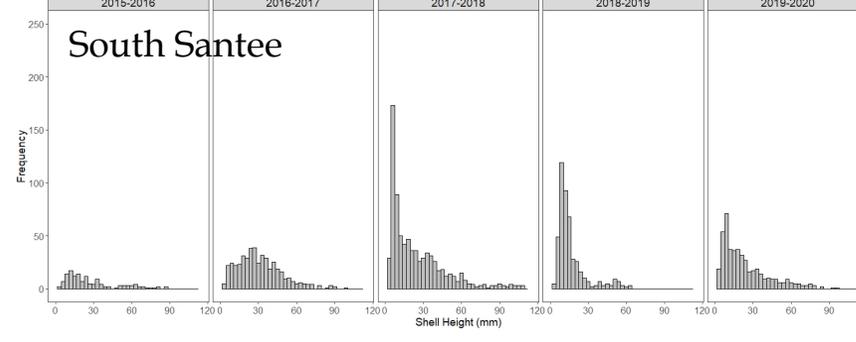
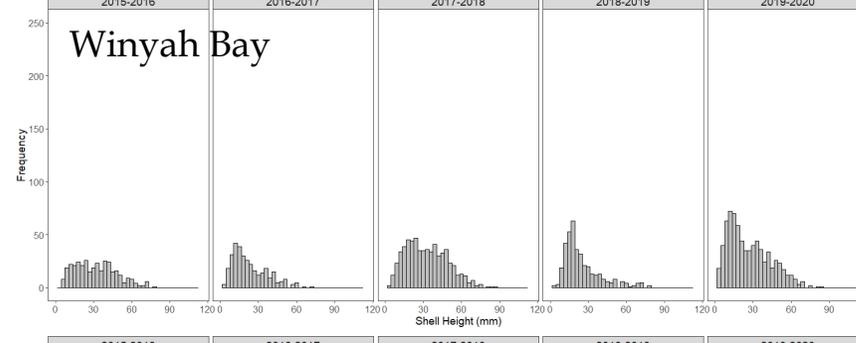
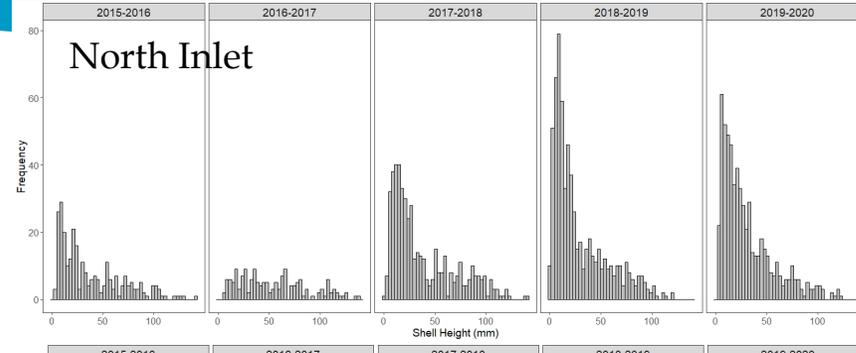
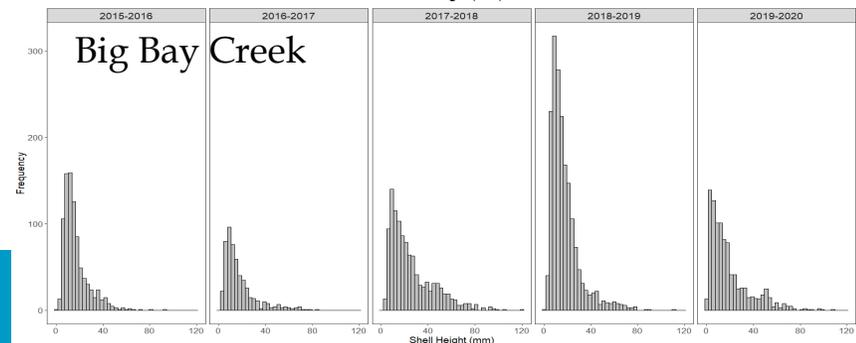
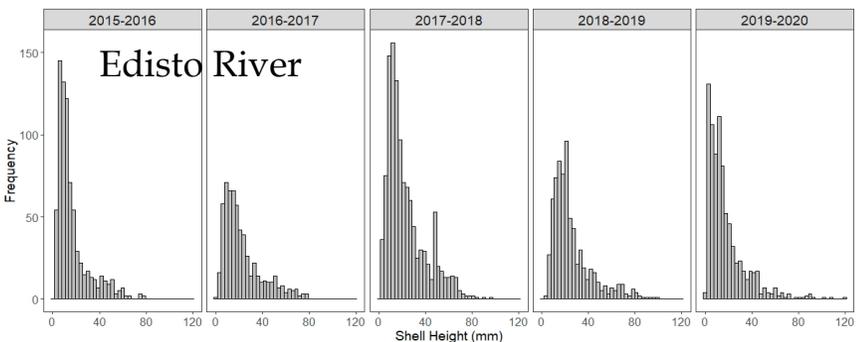
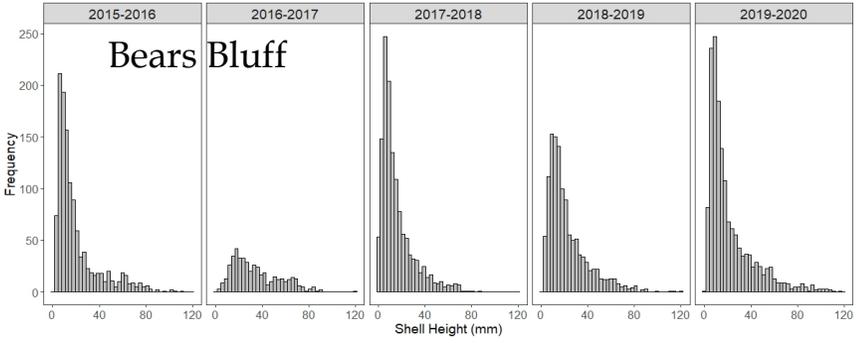
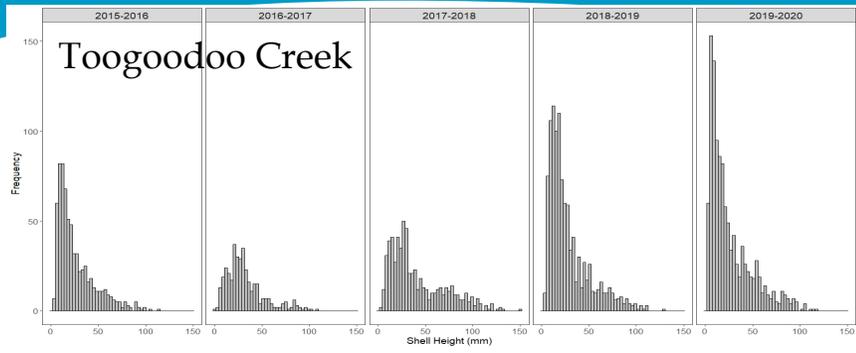
Within the oyster-supporting region, the Edisto planning area has 2 distinct catchments: the South Edisto & North Edisto

The North Edisto does not have a large upland input









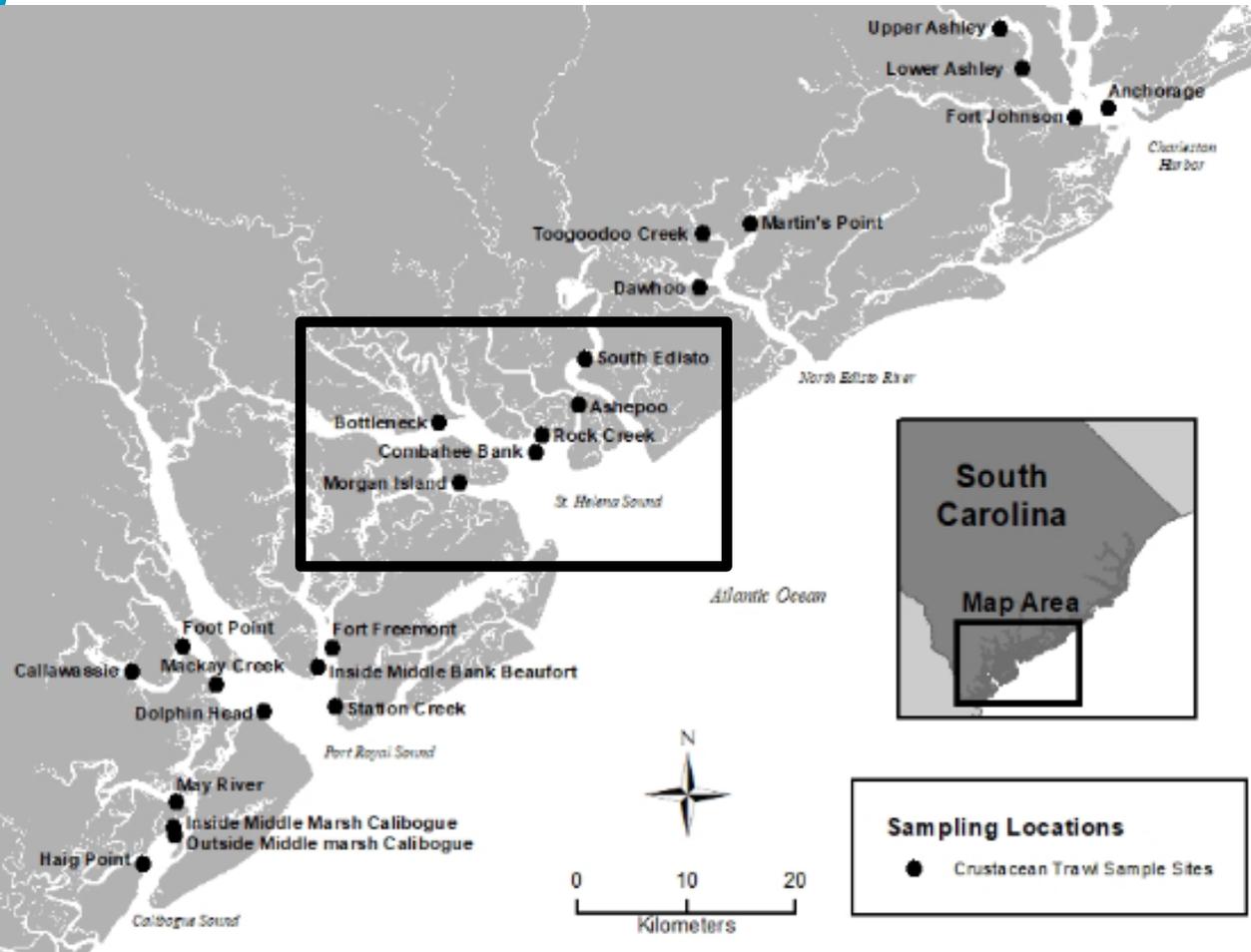
Crustacean & Mollusk Research Section

Estuarine Trawl Survey

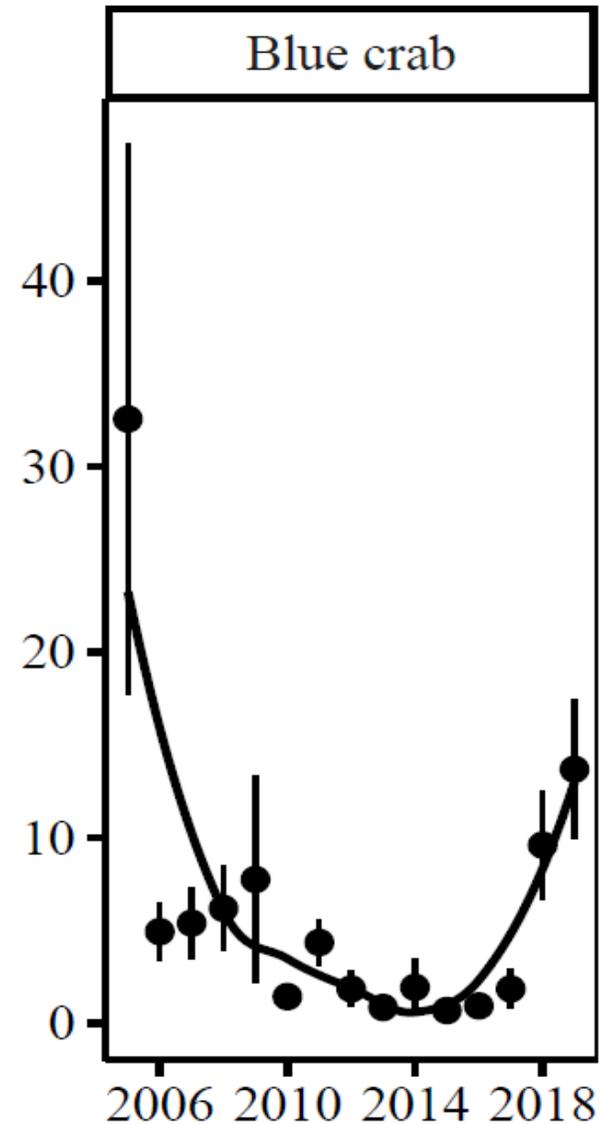
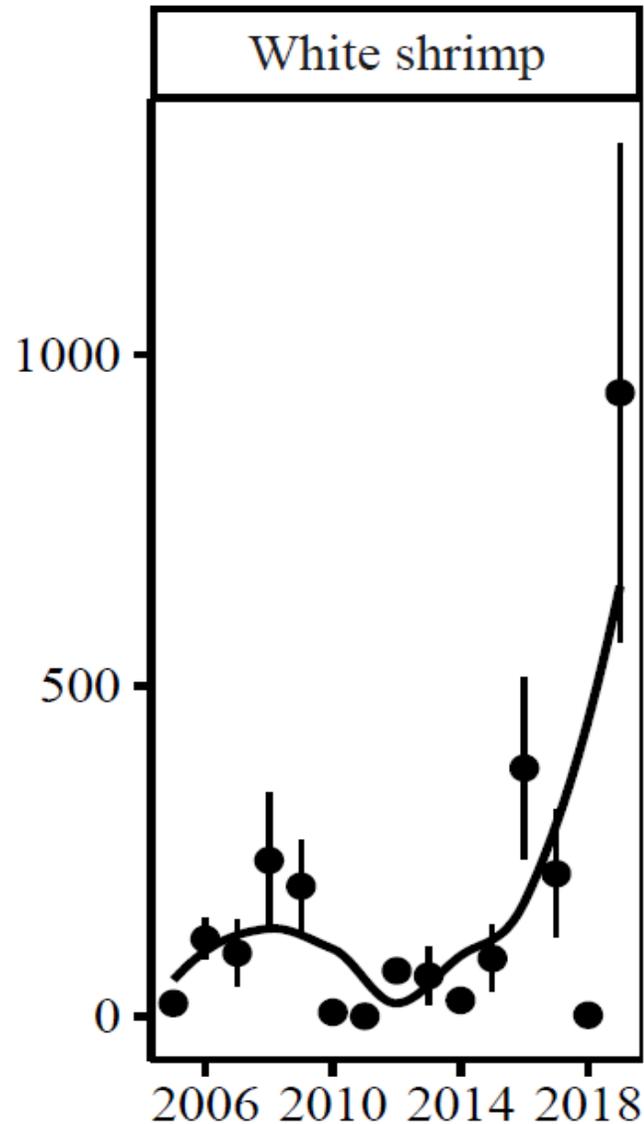
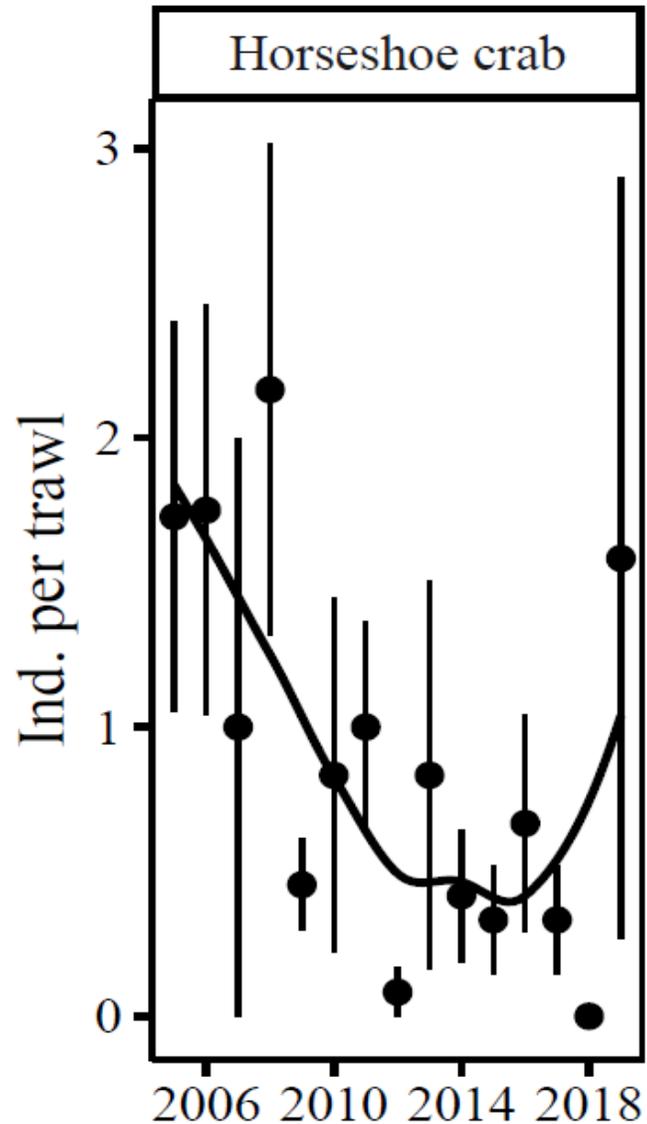


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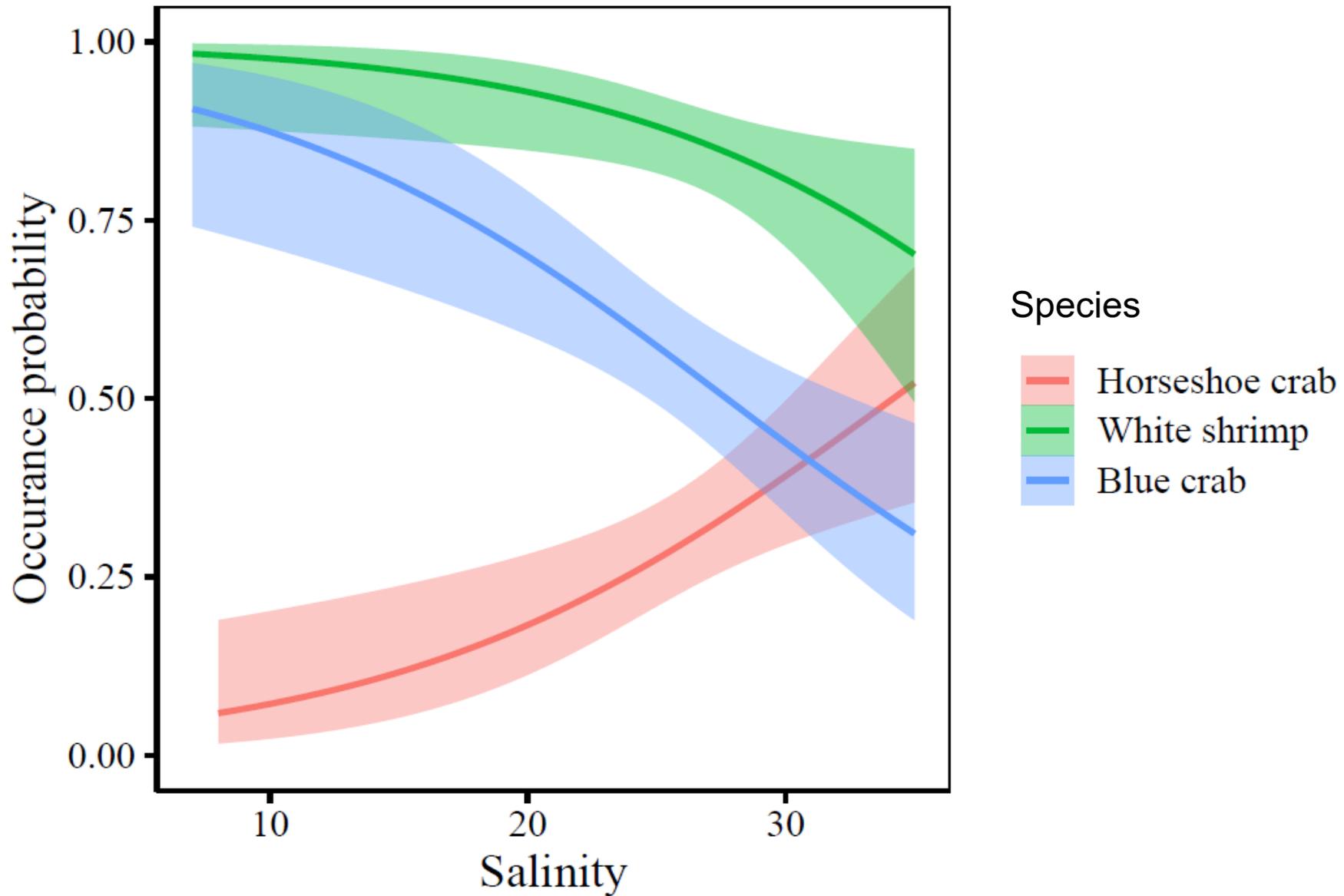
Estuarine Trawl Survey



Long-term variability in species abundances



Species specific responses to salinity





Environmental Research Section

South Carolina Estuarine and Coastal Assessment Program (SCECAP)



SCECAP ACE Basin Data

Time frame: 1999-2018

Summer (July and August) sampling

Sites

RT: tidal creek sites; RO: open water sites

Water Quality Data

Basic water quality

Bacteria

Nutrients

- ACE NERR collects variety of water quality and marsh data (not shown here)
 - Late 1990s-present
 - 5 continuous water quality stations throughout estuary
 - Monthly nutrient information

Sediment Data

Sediment quality

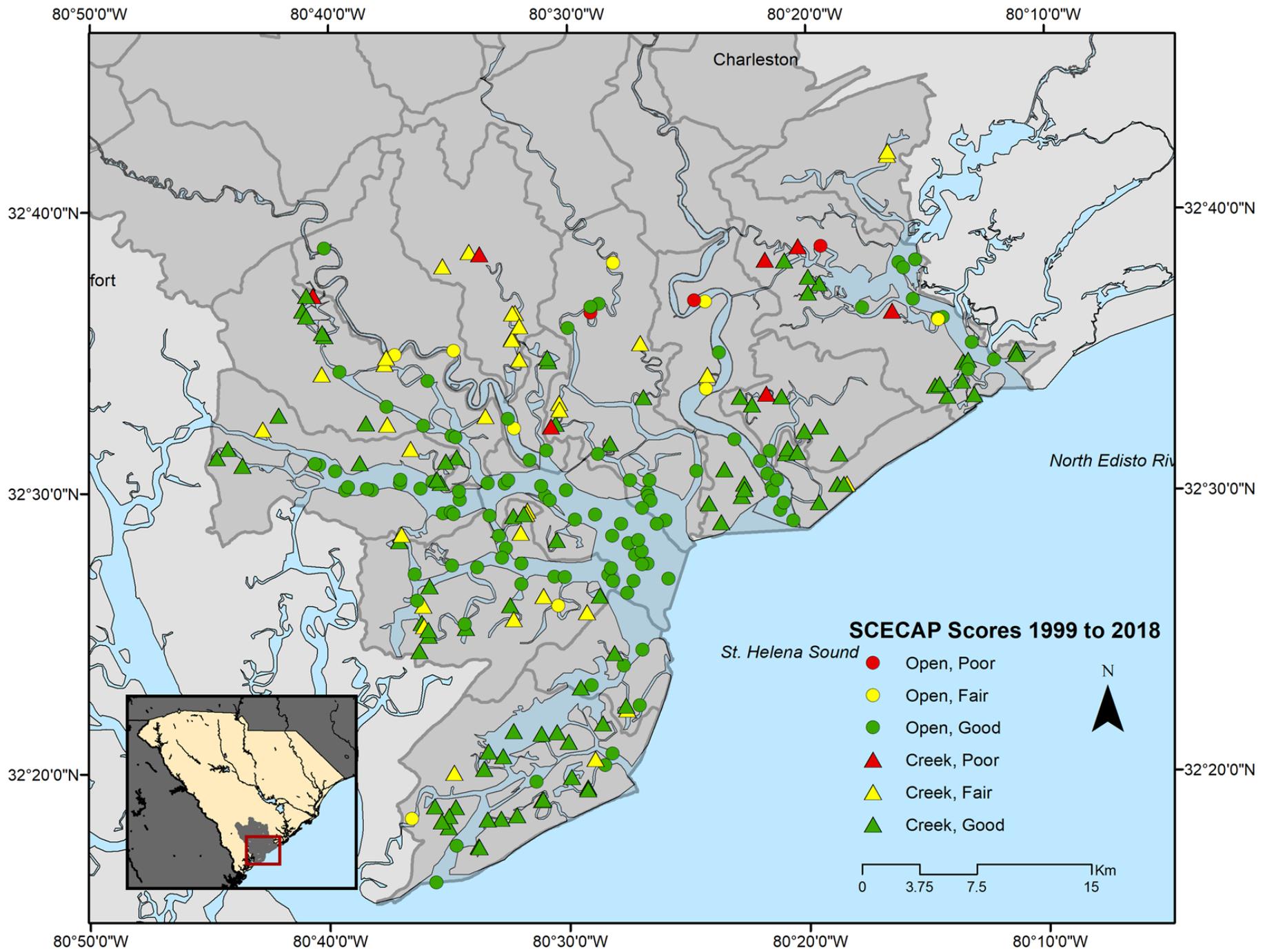
Sediment contamination

Biological Data

Benthic infauna

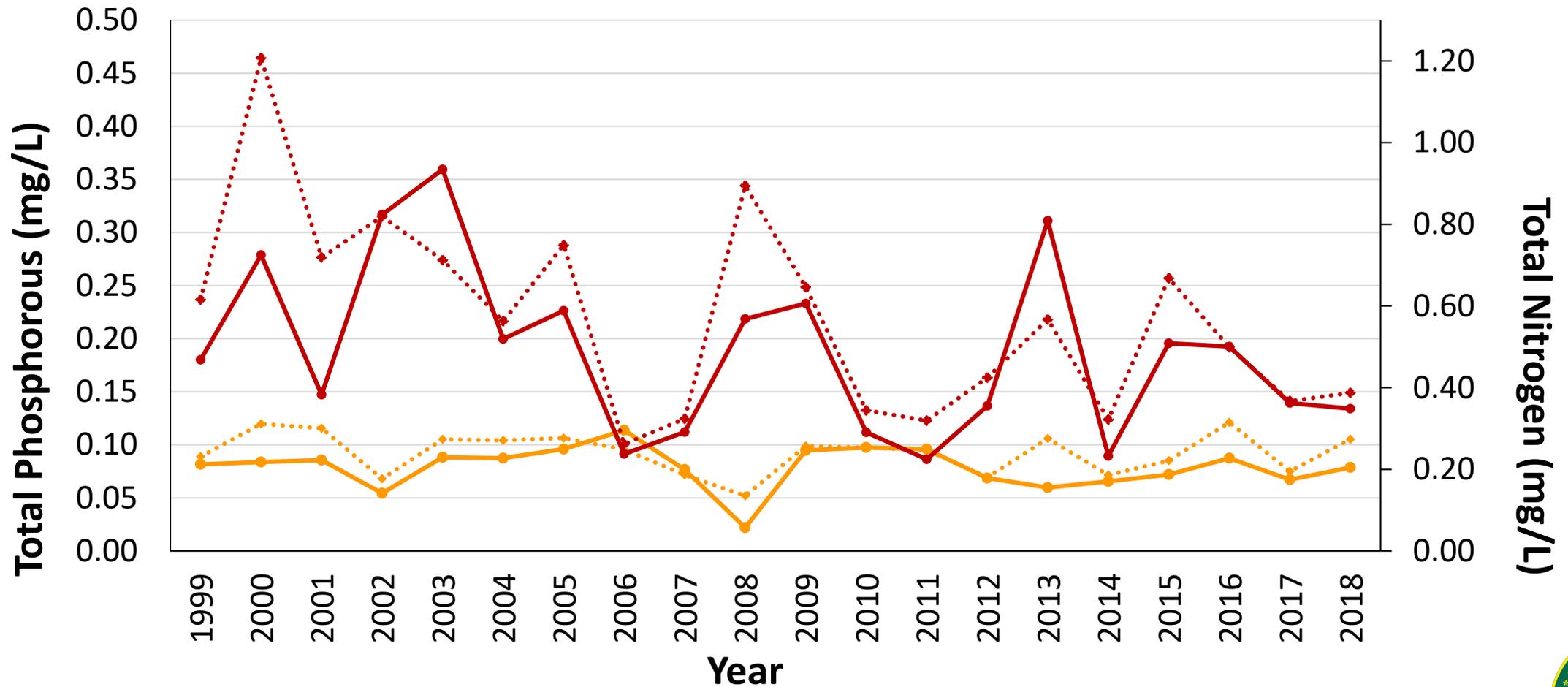
Nekton





ACE SCECAP Water Quality Data - Nutrients

—●— RO - Average of TP
 - - -●- - - RT - Average of TP
 —●— RO - Average of TN
 - - -●- - - RT - Average of TN



ACE SCECAP Water Quality Data

Water Quality Regression

Water Quality (Tidal Creek Sites)

	TEMP (1)	DO (2)	SAL (3)	PH (4)	CHL (5)	TN (6)	TP (7)
Year	0.033 (-0.069, 0.135)	0.031*** (0.008, 0.054)	-0.395** (-0.775, -0.016)	0.001 (-0.006, 0.007)	0.152 (-0.553, 0.857)	-0.023*** (-0.038, -0.008)	-0.001 (-0.002, 0.001)
Constant	-36.303 (-241.502, 168.895)	-57.934** (-104.311, -11.558)	822.235** (59.483, 1,584.987)	6.180 (-7.532, 19.892)	-293.301 (-1,708.919, 1,122.317)	46.445*** (15.706, 77.184)	1.108 (-1.679, 3.895)
Observations	20	20	20	20	20	20	20
Log Likelihood	-25.282	-11.934	-59.337	12.421	-54.839	-1.710	40.592
Akaike Inf. Crit.	58.564	31.869	126.674	-16.843	117.678	11.420	-73.183
Bayesian Inf. Crit.	62.126	35.430	130.236	-13.281	121.239	14.982	-69.622

Note:

* p<0.1; ** p<0.05; *** p<0.01



Point of Contacts

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Questions

