



# *Data Exploration Process for the Spotted Seatrout (*Cynoscion nebulosus*) Stock Assessment*

*DEPARTMENT OF ENVIRONMENTAL QUALITY*

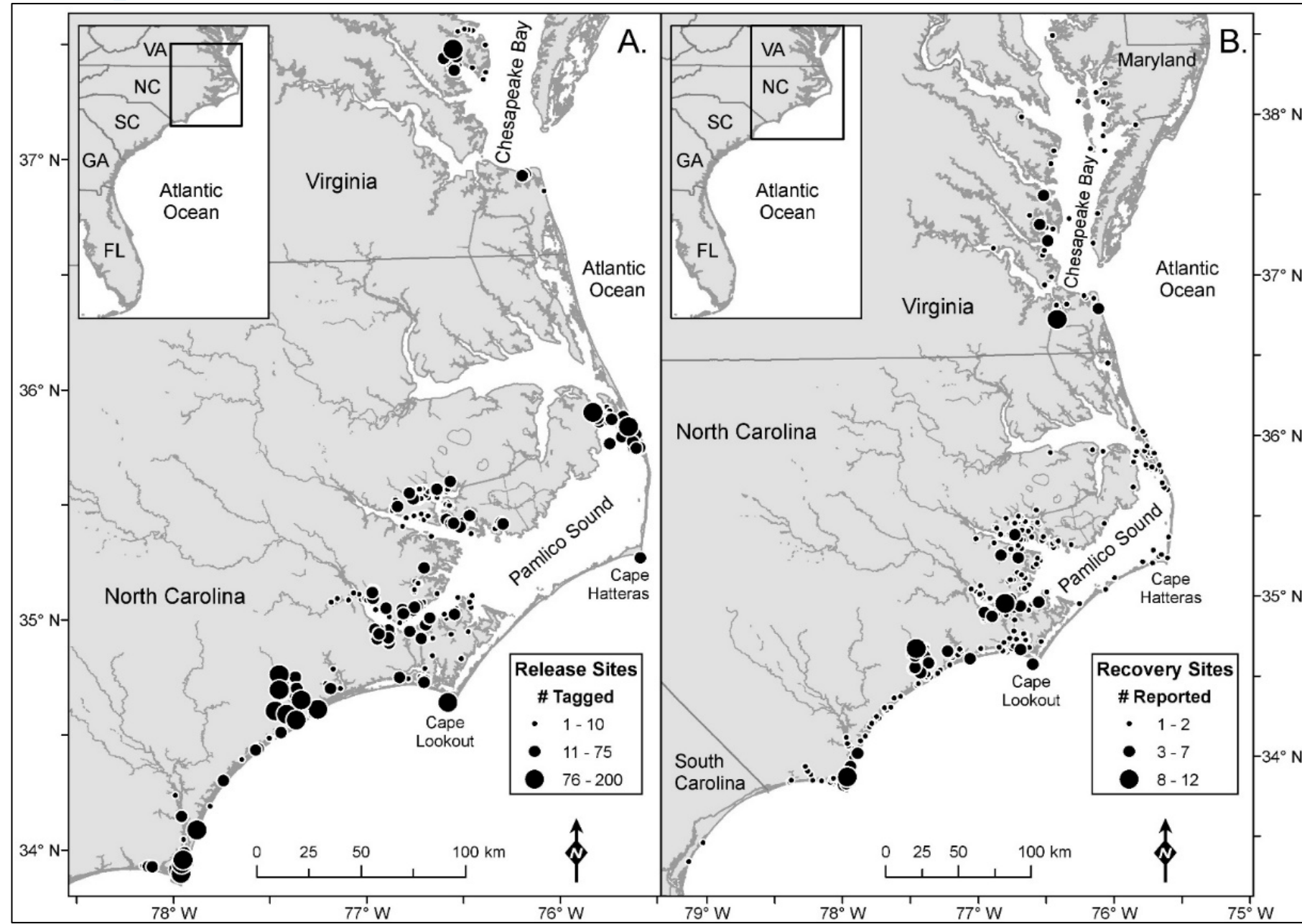
Marine Fisheries

N.C. Marine Fisheries Commission Meeting | Y. Li, D. Behringer & L. Pensinger | Nov 16-18, 2022



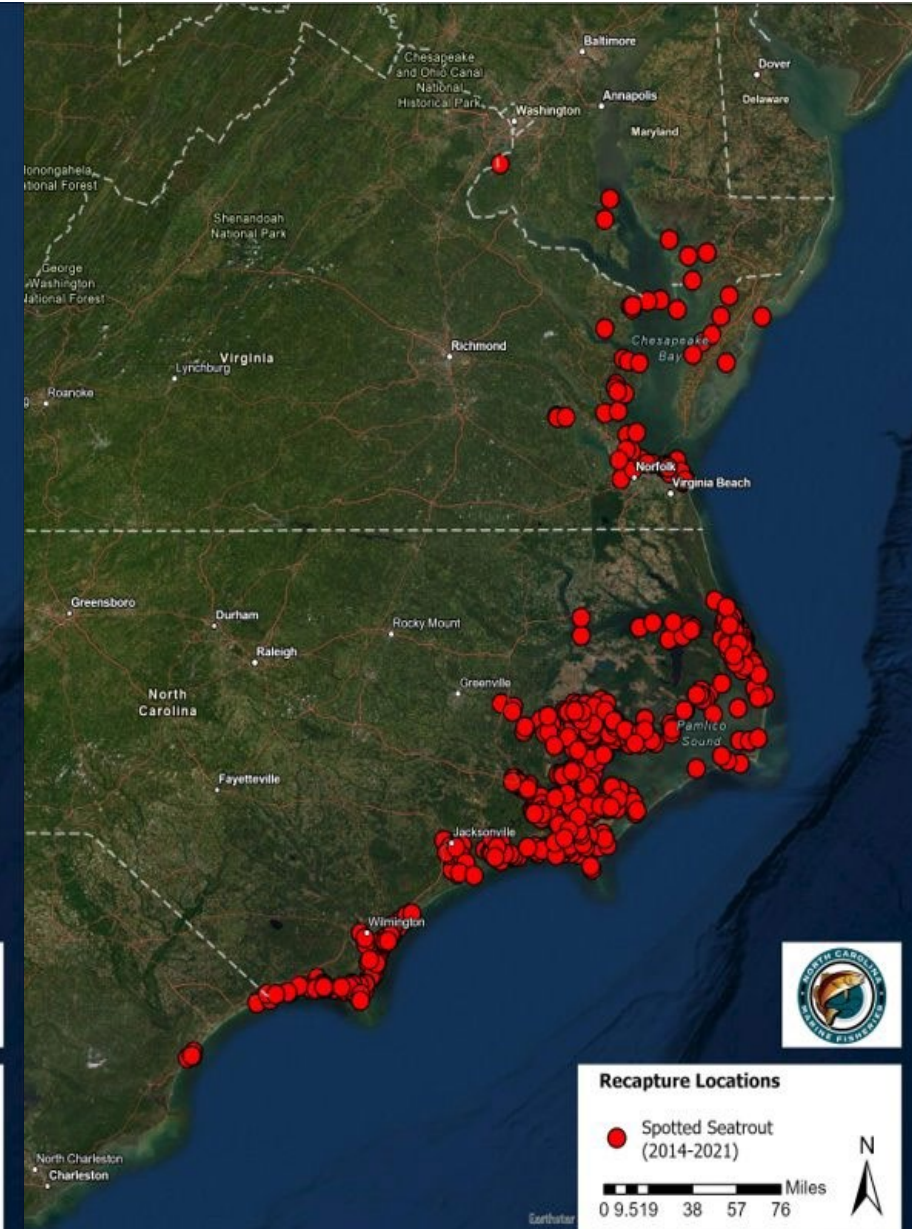
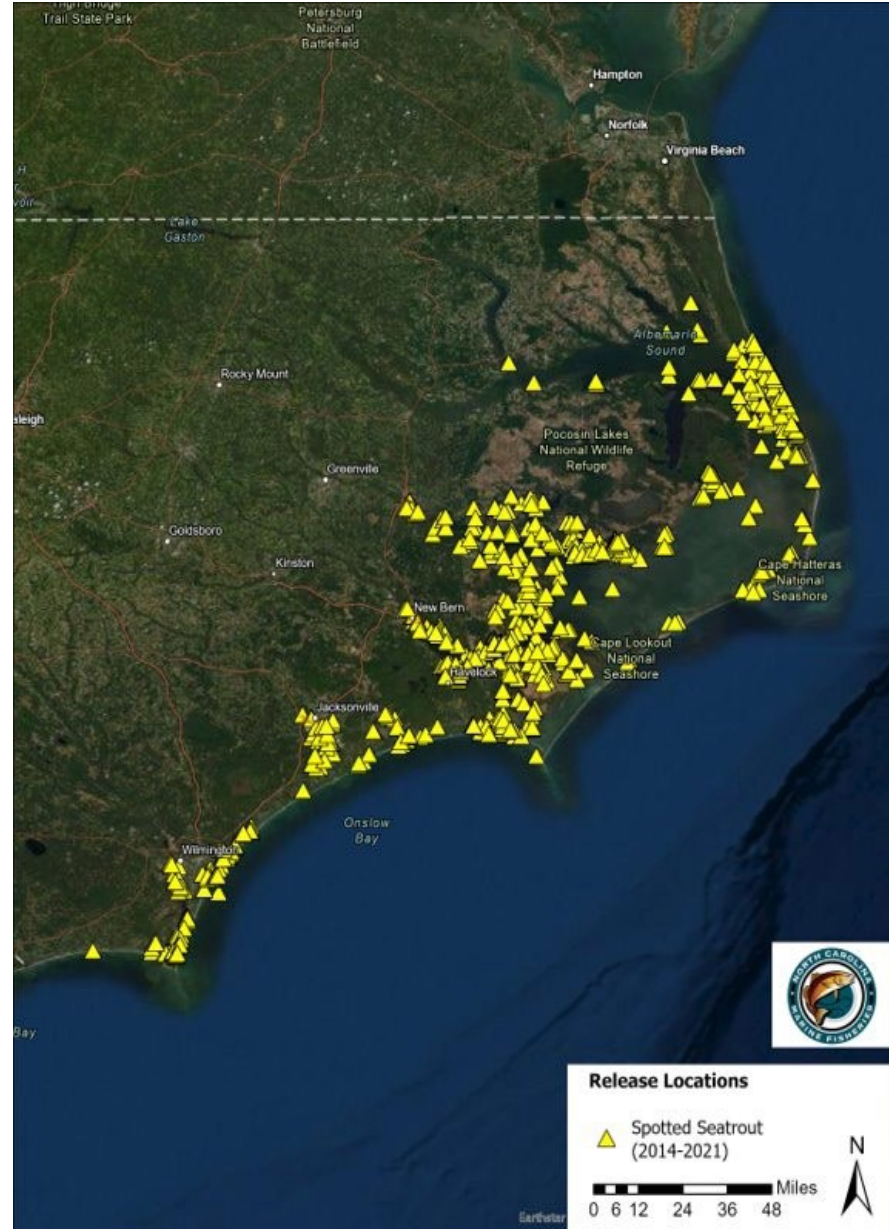
# Spotted Seatrout Unit Stock

- Combined North Carolina and Virginia stock
  - Tagging studies
  - Genetic studies



## Spotted Seatrout Unit Stock cont.

- Combined North Carolina and Virginia stock
  - Tagging studies
  - Genetic studies



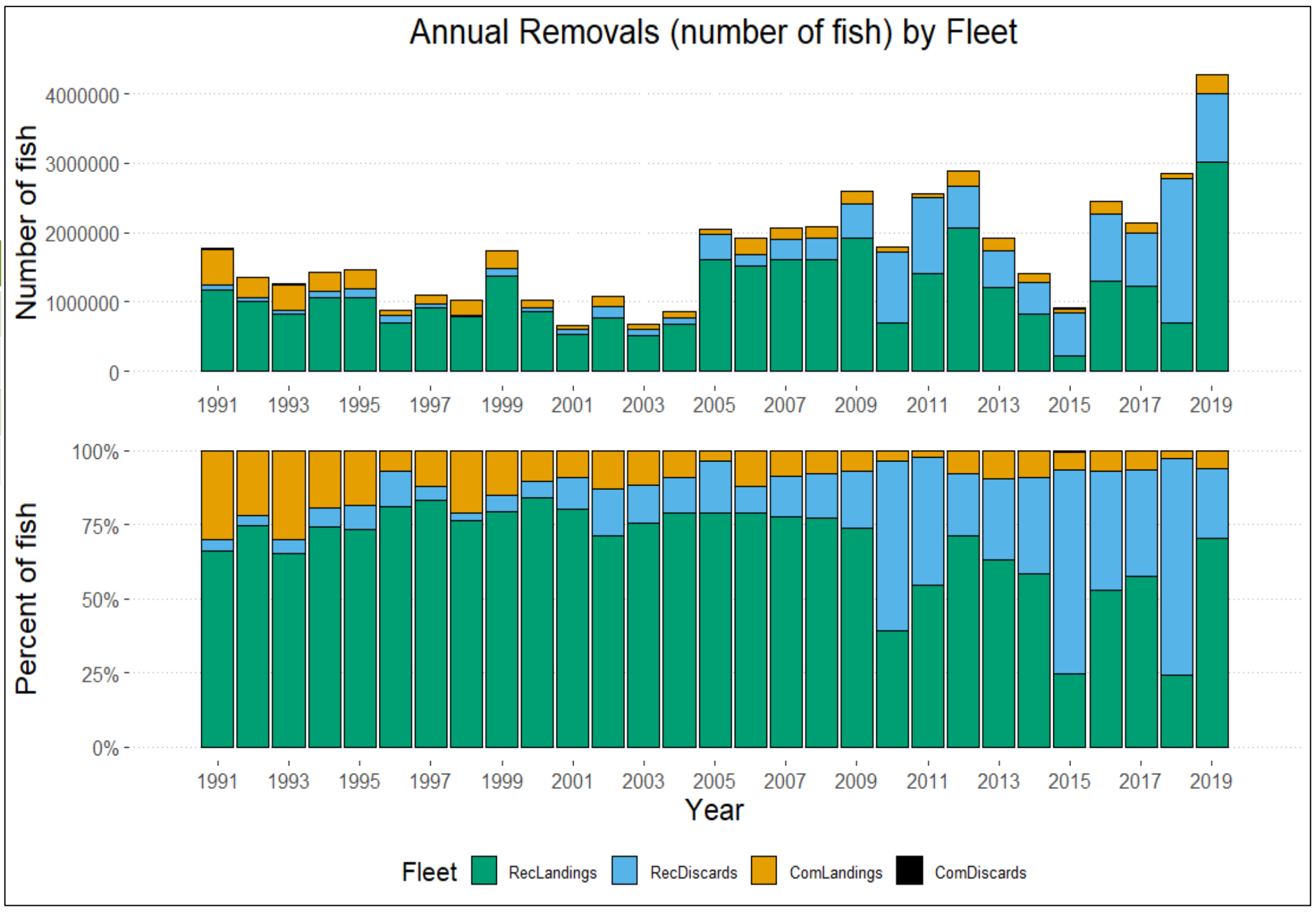
## *Description of Fishery*





# Annual Removals (number of fish) by Fleet

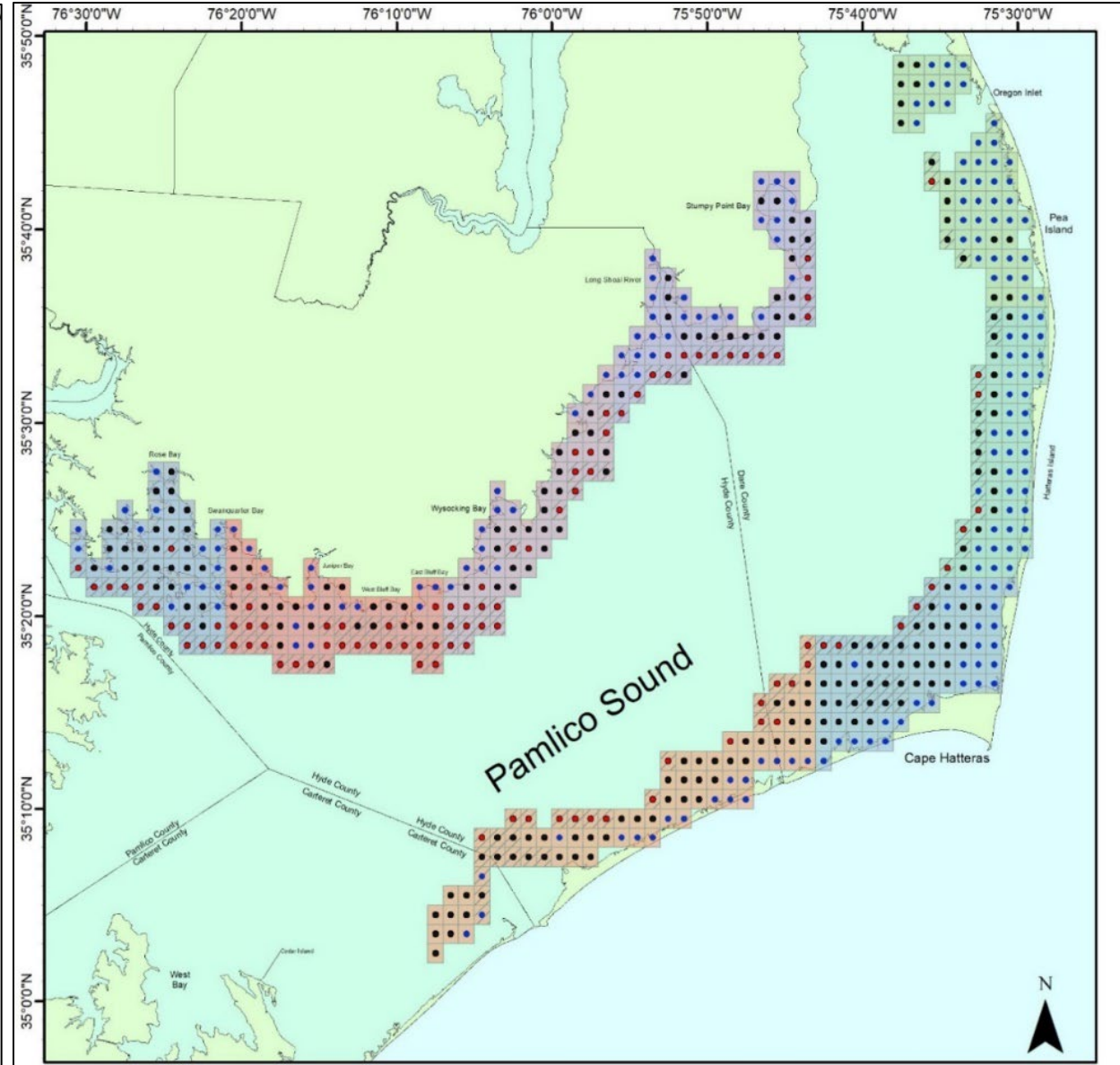
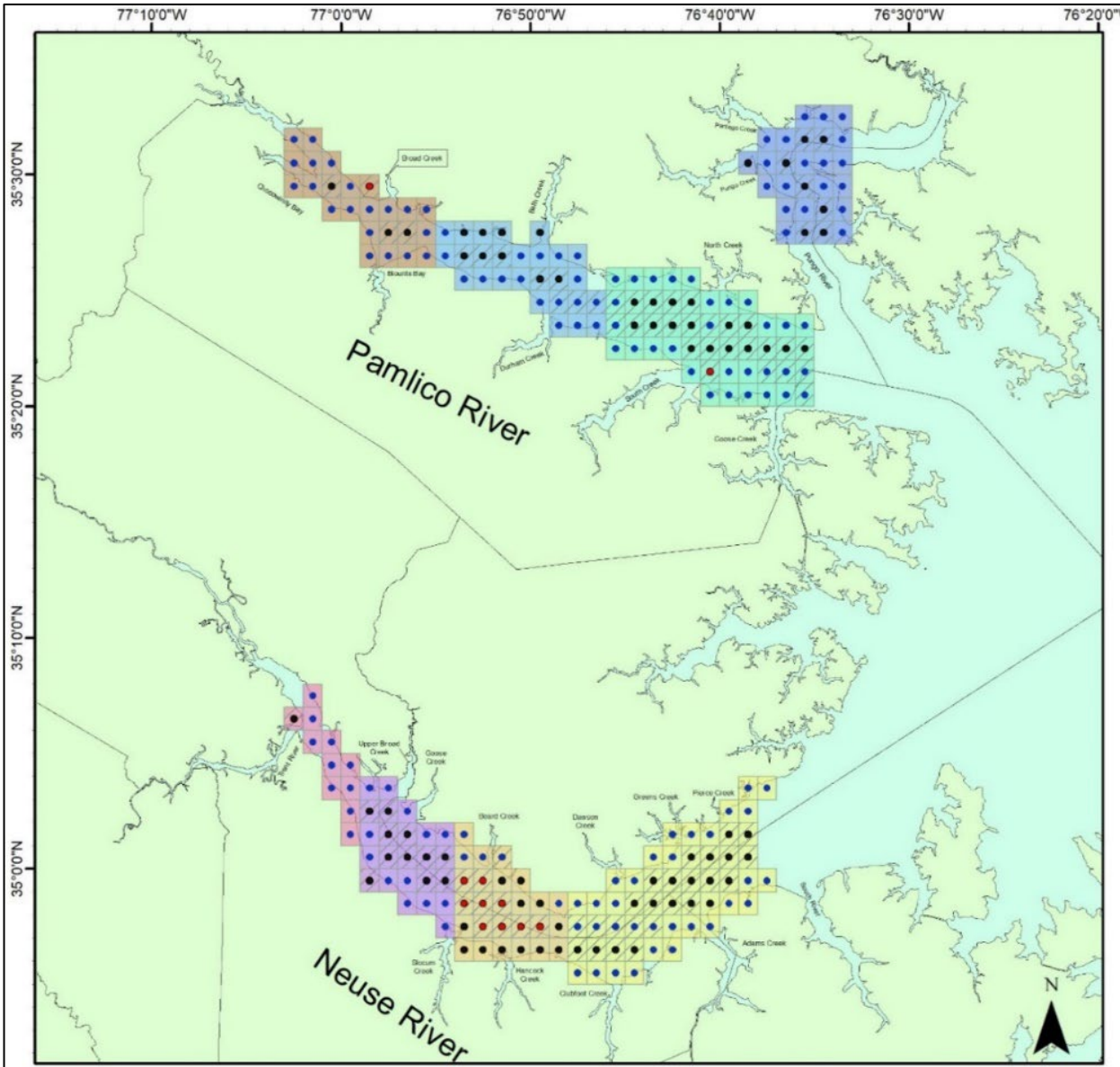
Time Series Percentage	
Rec. Landings	66.0%
Rec. Discards	23.8%
Comm. Landings	10.1%
Comm Discards	0.1%



## *Fisheries Independent Sampling Data*



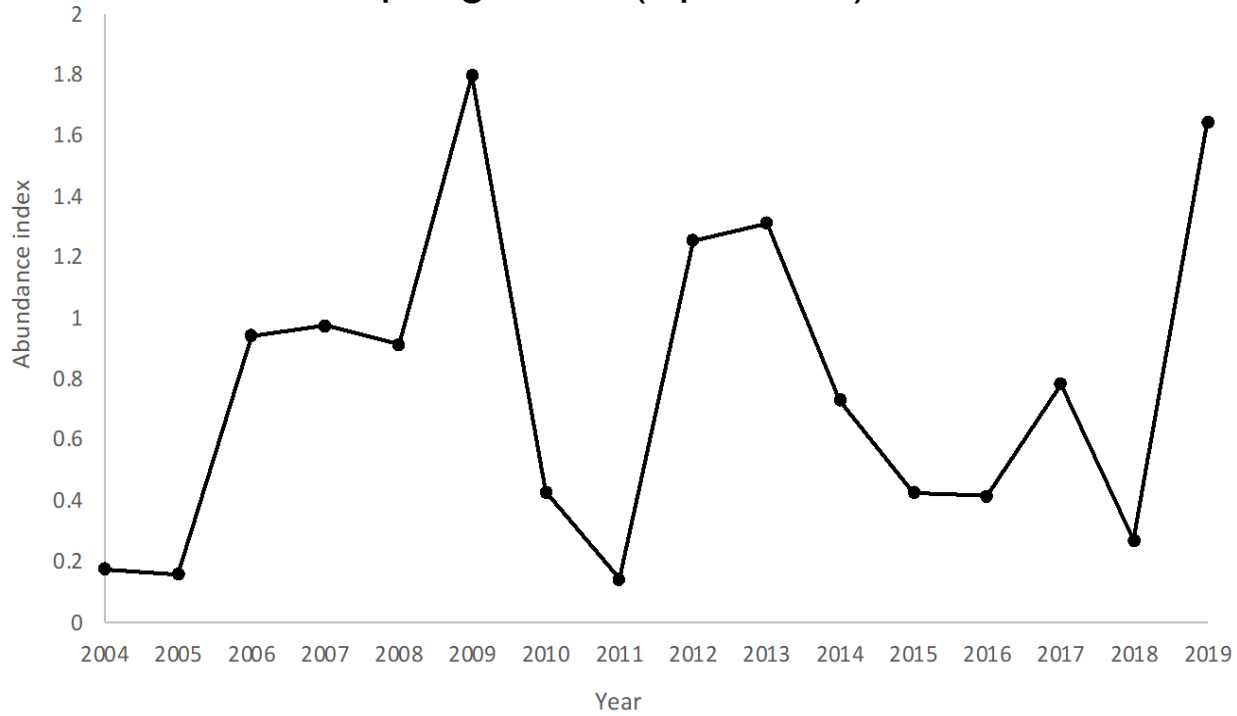
# Fisheries Independent Gill Net Survey



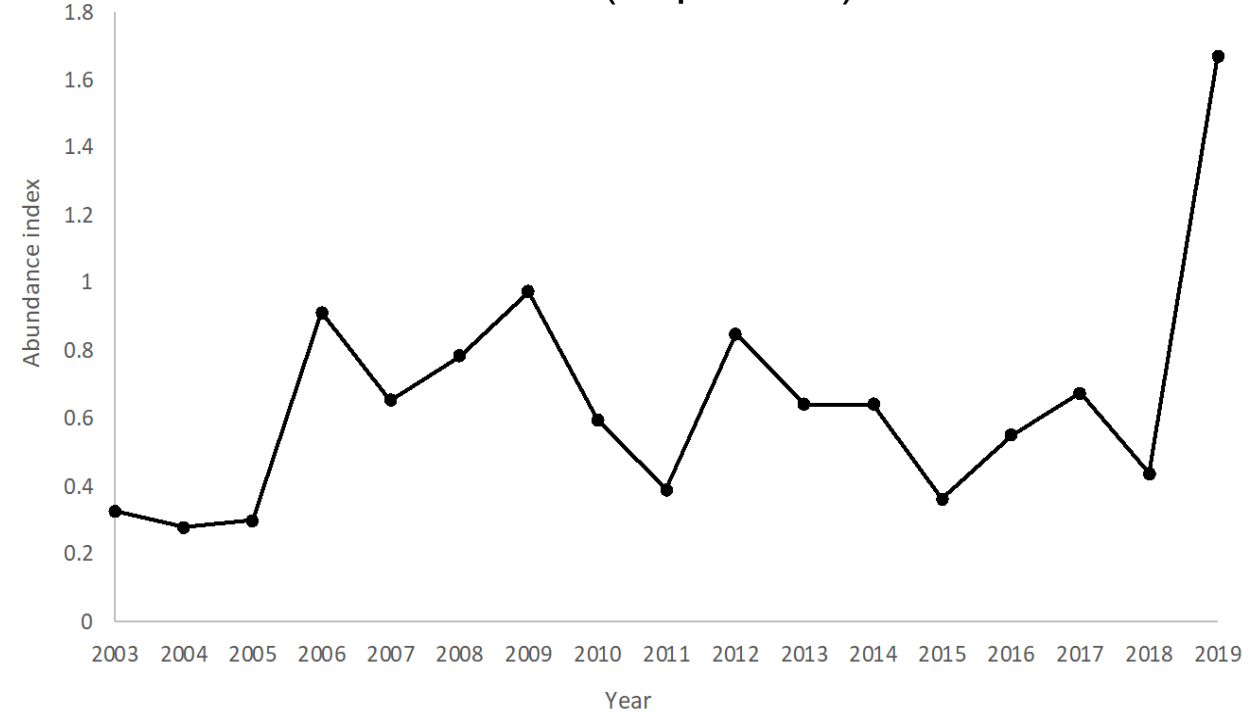
# Fisheries Independent Gill Net Survey cont.

## Indices of Abundance

### Spring Index (Apr.-June)



### Fall Index (Sept.-Nov.)





## *Additional Surveys and Data*

- DMF Surveys:
  - Juvenile Trawl (P120)
  - Pamlico Sound Trawl (P195)
  - Juvenile Red Drum Seine (P123)
  - Striped Bass Gill Net (P135)
  - Fisheries-Independent Gill Net – Cape Fear River and Central (P915)
- Non-DMF Surveys:
  - CHESMAP, NEAMAP, SEAMAP
- Age data and maturity/reproductive data
  - Informs model parameters



## *Additional Surveys and Data cont.*

- Tagging data
  - Fishery selectivity
  - Set ratio of natural mortality between winter and non-winter season
  - External validation on natural mortality in winter
- Temperature data
  - Not included directly, but explored use
  - Informed model discussions



## *Tailoring model to Spotted Seatrout*

- **Cold stuns**
  - Incorporates higher winter season mortality
- **Size structured**
  - Manage based on length
  - Removes age-length conversion error
  - Length easier to obtain in field for greater number of fish
- **Non-stationary biological processes**
  - Allows variable mortality and growth
- **Seasonal time-step**
  - Winter vs non-winter season



# Questions?

Lucas Pensinger

Email: [lucas.pensinger@ncdenr.gov](mailto:lucas.pensinger@ncdenr.gov)

Office: 252-808-8259

David Behringer

Email: [david.behringer@ncdenr.gov](mailto:david.behringer@ncdenr.gov)

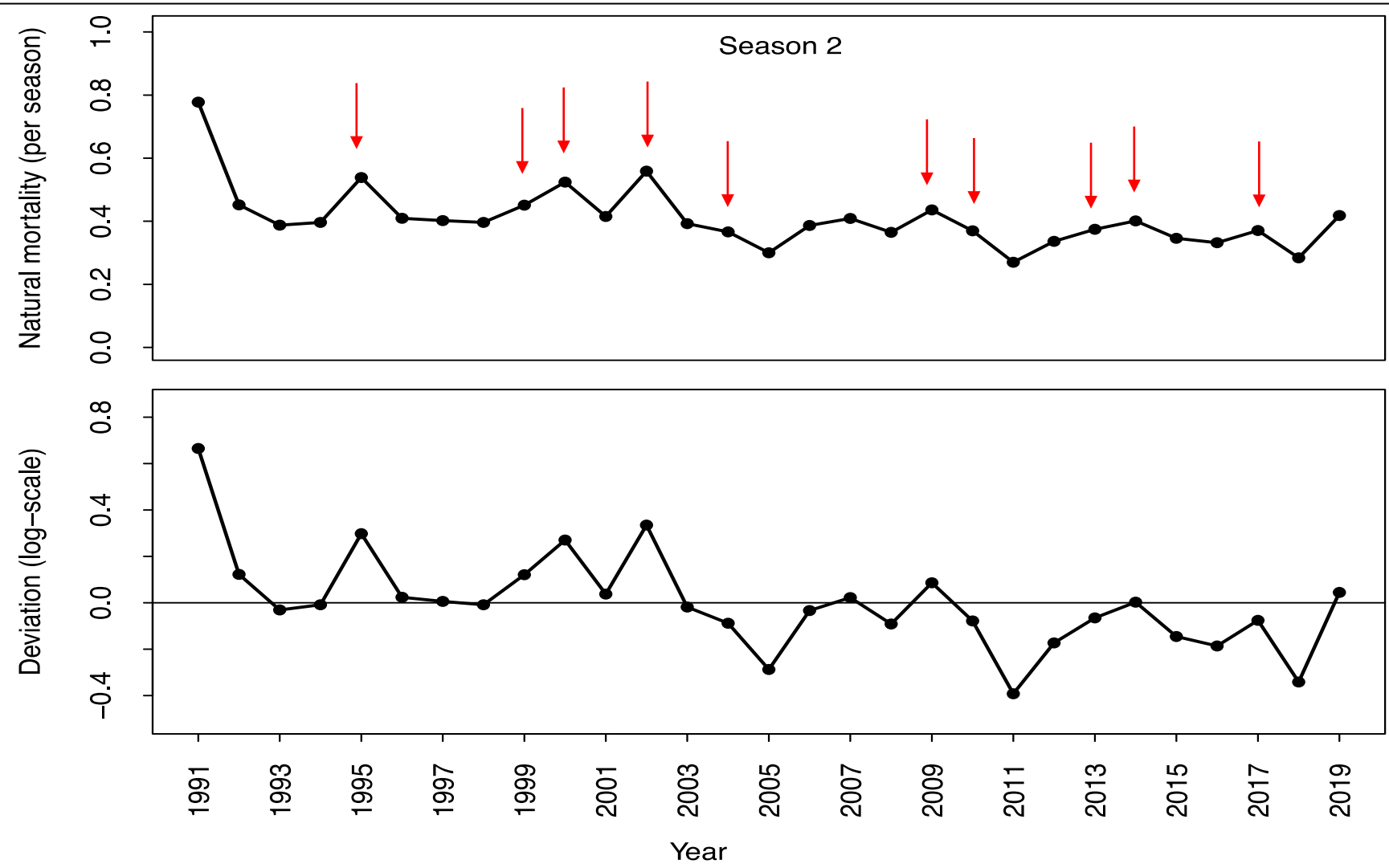
Office: 252-473-5734



# *EXTRA SLIDES*



# Natural Mortality: Season 2 (December–February)



Cold-stun records:

Year	Month	Stock Assessment Year
1995	December	1995
2000	January	1999
2001	January	2000
2003	January	2002
2004	December	2004
2010	January	2009
2010	December	2010
2014	January	2013
2015	February	2014
2018	January	2017



# Tagging

- NC
  - DMF
    - Low reward tags, double tags, high reward tags
    - Tagged with Floy wire core internal anchor tags
    - October 2014–November 2019
  - NC State University
    - Low reward tags, double tags, high reward tags
    - Tagged with Floy wire core internal anchor tags
    - Sept 2008–October 2012
- VA
  - VMRC
    - Low reward tags
    - T-bar and dart tags dependent on size of fish
    - 1995–2018
- All programs sampled year-round



Data	Unit	CV/SE	Availability	Length composition	State
<b>Landings</b>					
<b>ComLanding</b>	Number	0.05	1991–2019	1991–2019	NC and VA
<b>RecLanding</b>	Number	0.1	1991–2019	1991–2019	NC and VA
<b>Discards</b>					
<b>ComDiscard</b>	Number	0.25	1991–2019	NA	NC
<b>RecDiscard</b>	Number	0.25	1991–2019	NA	NC and VA
<b>Indices</b>					
<b>P915NorthSpring</b>	Number per unit effort	Estimated	2004–2019	2004–2019	NC
<b>P915NorthFall</b>	Number per unit effort	Estimated	2003–2019	2003–2019	NC

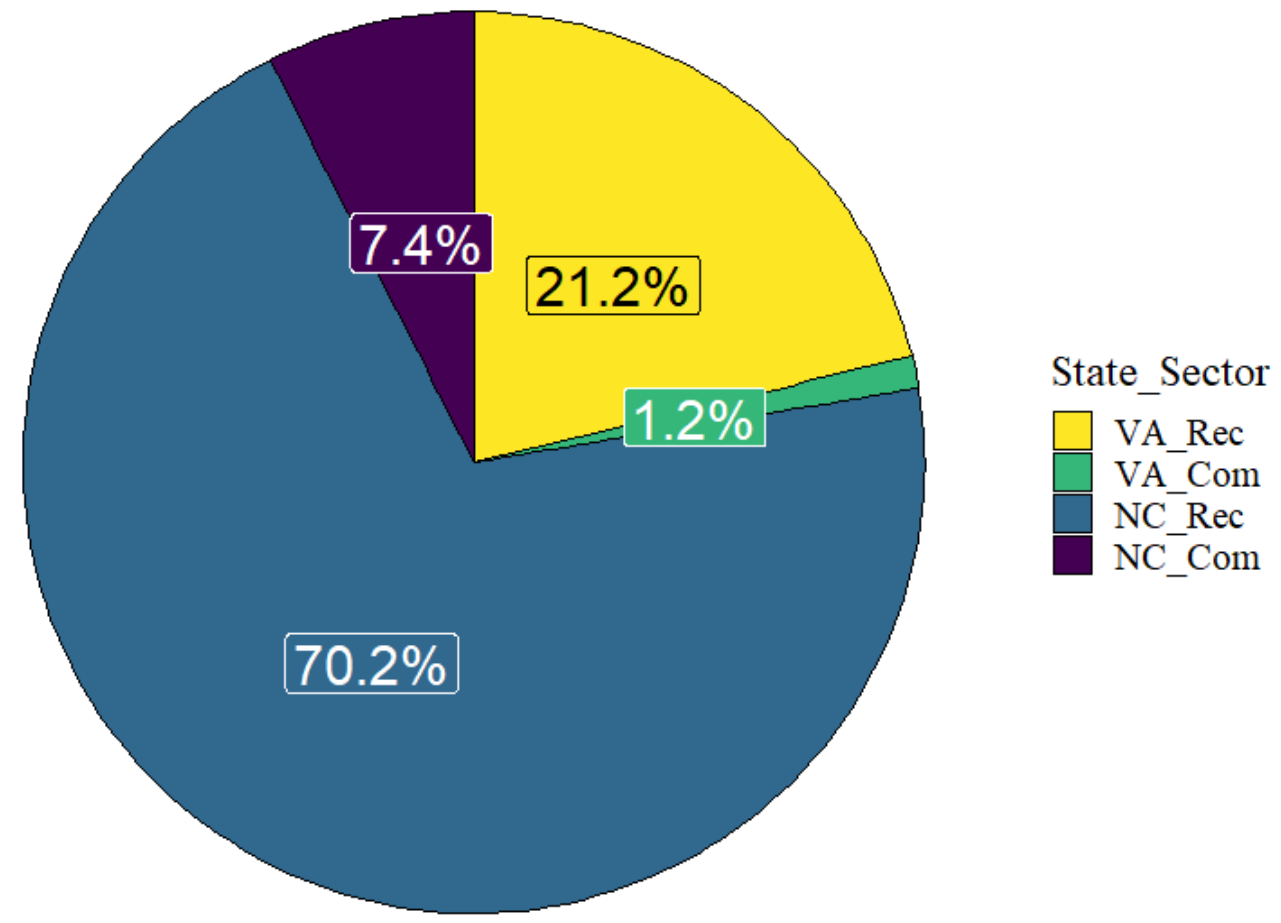






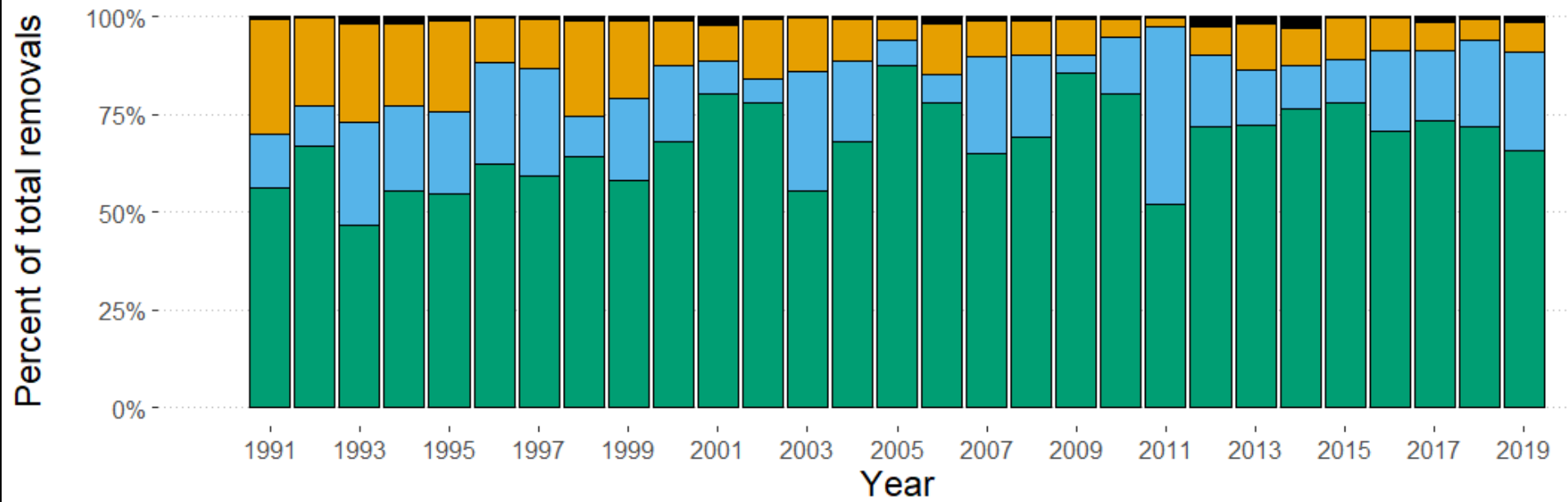
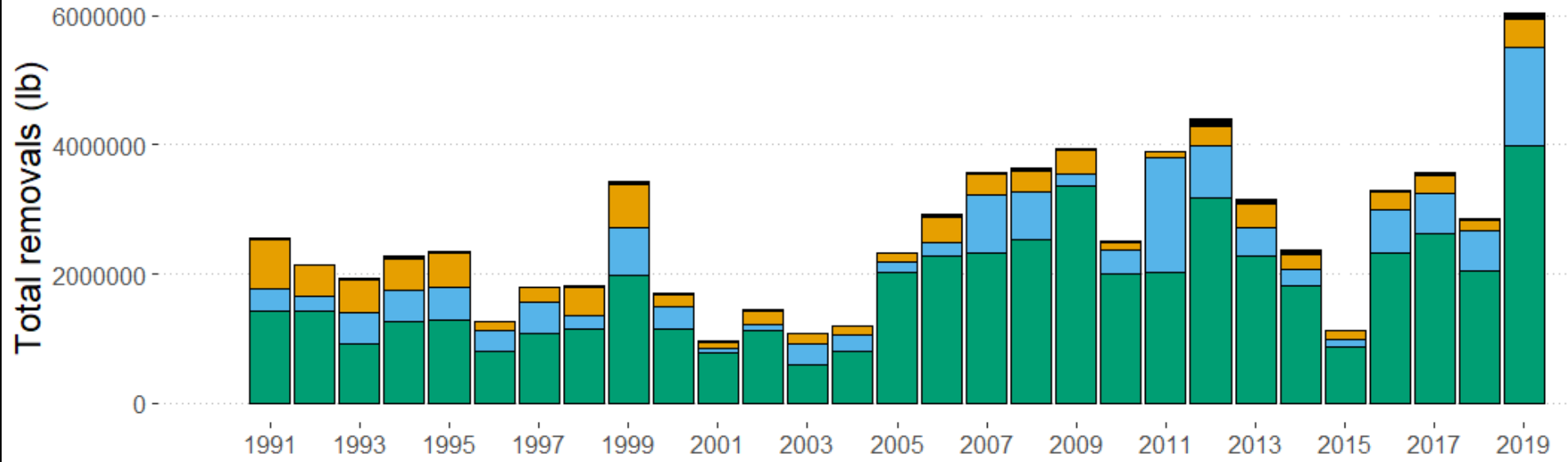
# Description of Fishery

## Percentage of Spotted Seatrout Fishery by State and Sector





### Annual Removals (pounds) by State and Sector (harvest and dead discards)



- Time Series %
- NC\_Rec: 68.10%
  - VA\_Rec: 18.90%
  - NC\_Com: 11.76%
  - VA\_Com: 1.24%

State\_Sector NC\_Rec VA\_Rec NC\_Com VA\_Com

