Southeast Reef Fish Survey

2023 Sampling Activities and Relative Abundance Trends

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Christina Schobernd and Nate Bacheler (SEFSC)

October 2024 Snapper-Grouper Advisory Panel Meeting

Photos: SERFS

Presentation Overview

SERFS

Survey Design

2023 Activities

Trap and Video Abundance Indices through 2023 for Selected Species

Length & Distribution from Trap Catches for Selected Species

2024 Planned Activities

Photos: SERFS

Relative Abundance Overview Caveats

- Not an update of stock status
- Constraints, stratification, units, and models may be different from those used in (SEDAR) stock assessments
- May not have been reviewed in a SEDAR or other assessment framework

Southeast Reef Fish Survey (SERFS)

Current Funding & Sampling:

MARMAP + SEAMAP-SA + SEFIS

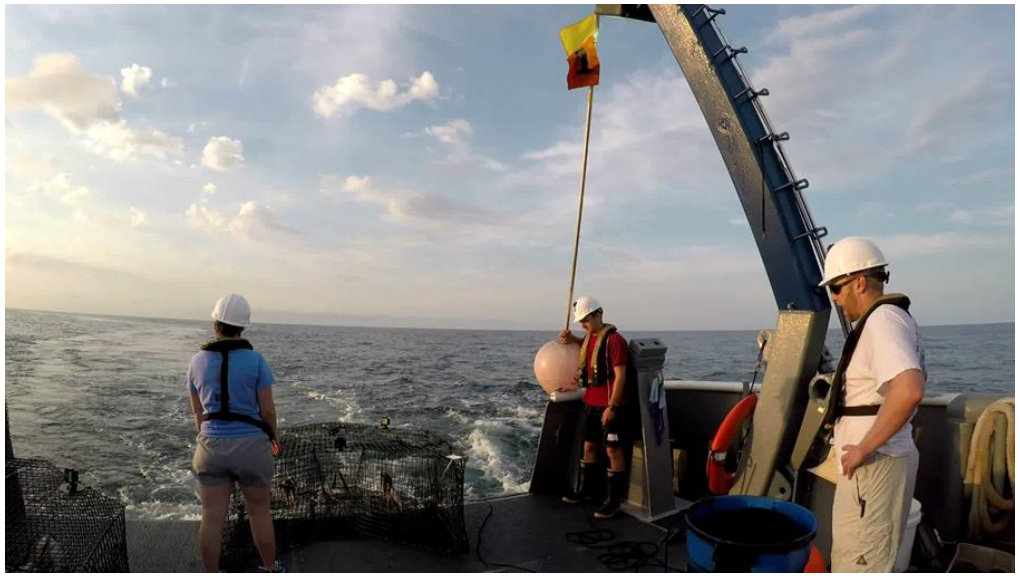
Historical Funding & Sampling:

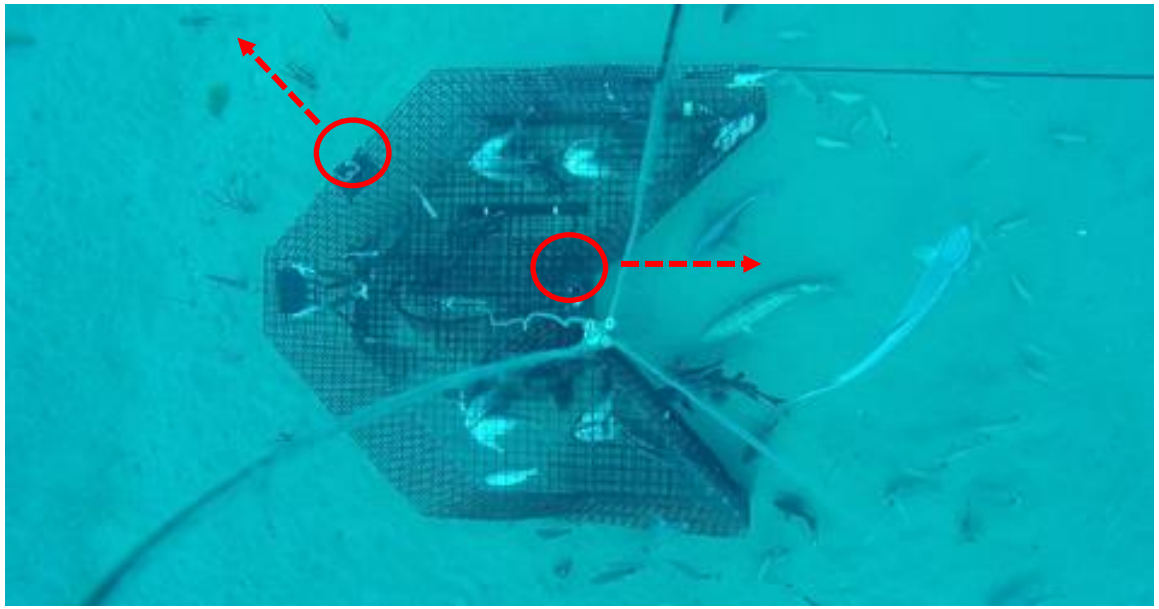
MARMAP

Marine Resources Monitoring, Assessment & Prediction Program (SCDNR)
Southeast Area Monitoring & Assessment Program - South Atlantic (SCDNR)
Southeast Fishery-Independent Survey (SEFSC)

Chevron Video Trap (CVT) Sampling

- Target low to medium relief, hard-bottom habitats
- Depths ~15-110 m
- April - October
- Trap used consistently and standardized since 1990
- Baited with menhaden, soak time ≈90 minutes
- Since 2011: all traps have 2 video cameras





CVT Universe

- ~ 4,300 trap sampling stations (NC-FL)
- Simple, random selection
- ~ 1,500 targeted in 2023

Sample and data processing & analyses

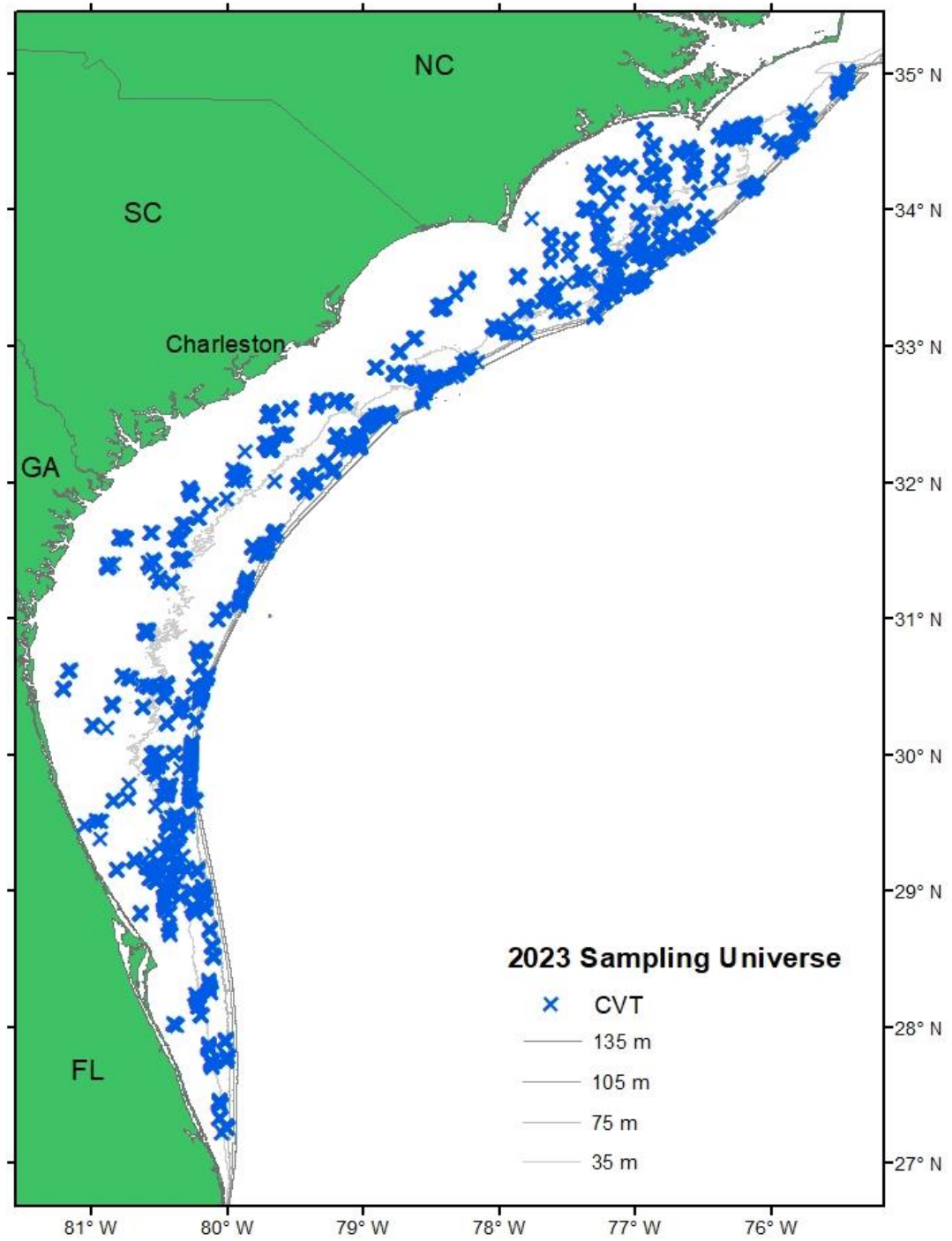
MARMAP & SEAMAP-SA (SCDNR):

- Catch indices
- Life history

SEFIS (SEFSC)

- Video indices

Publicly-available data SEAMAP.ORG

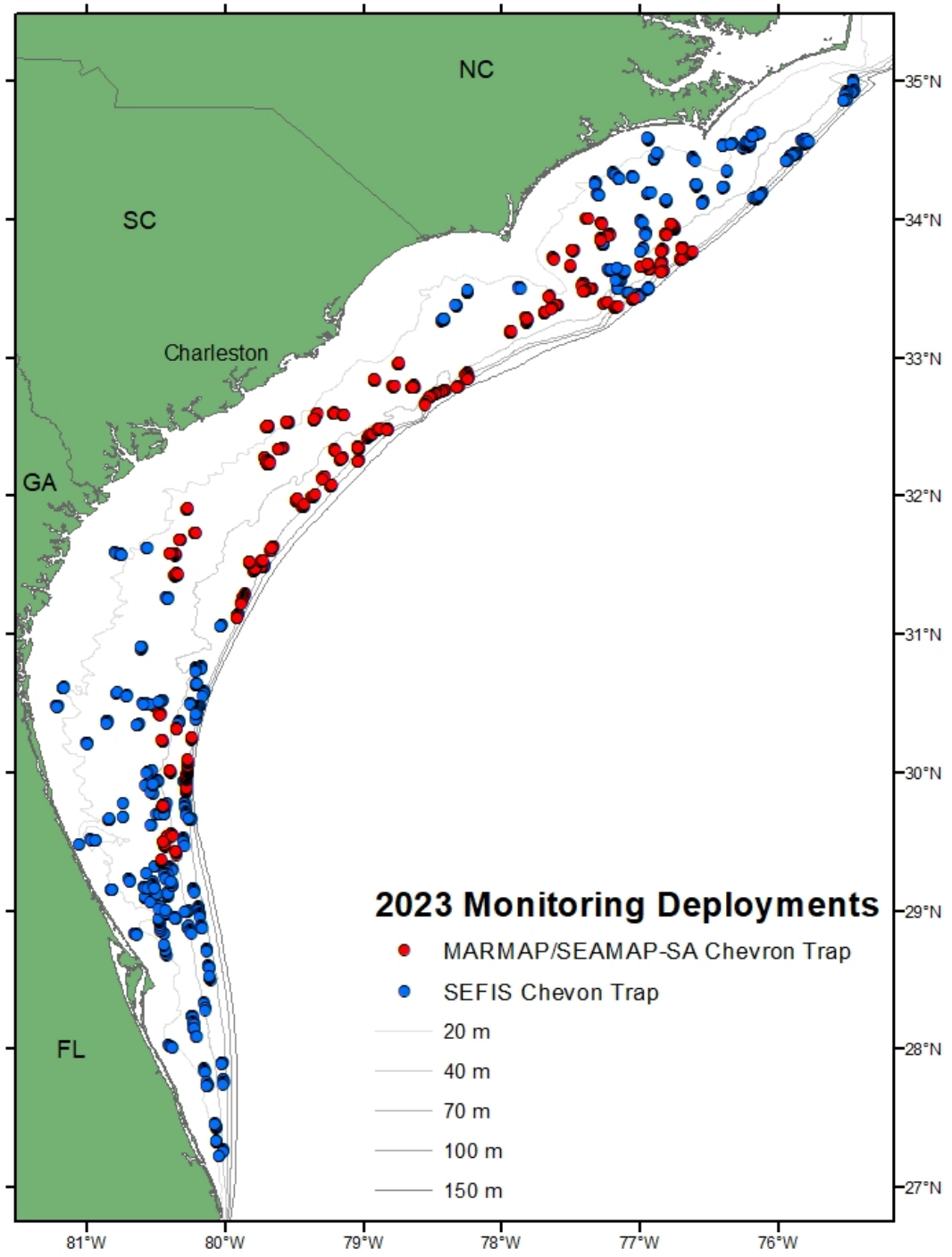


2023 SERFS Activities

- **86** days at sea (+ 5 mapping days)
- **1,825** gear deployments

  1,547 CVTs

  278 CTD casts
- **CVTs = 38,454** fish (**83** species) collected, measured, weighed
- **9,755** fish (**31** species) retained for life history (age, maturity, DNA)



Overview of CVT Relative Abundance

- Catch index (1990-2023)
- Video index (2011-2023)
- No sampling in 2020 (COVID-19)
- Standardized using Zero-Inflated Negative Binomial model (ZINB)

  Most appropriate method, reduces uncertainty

Catch:

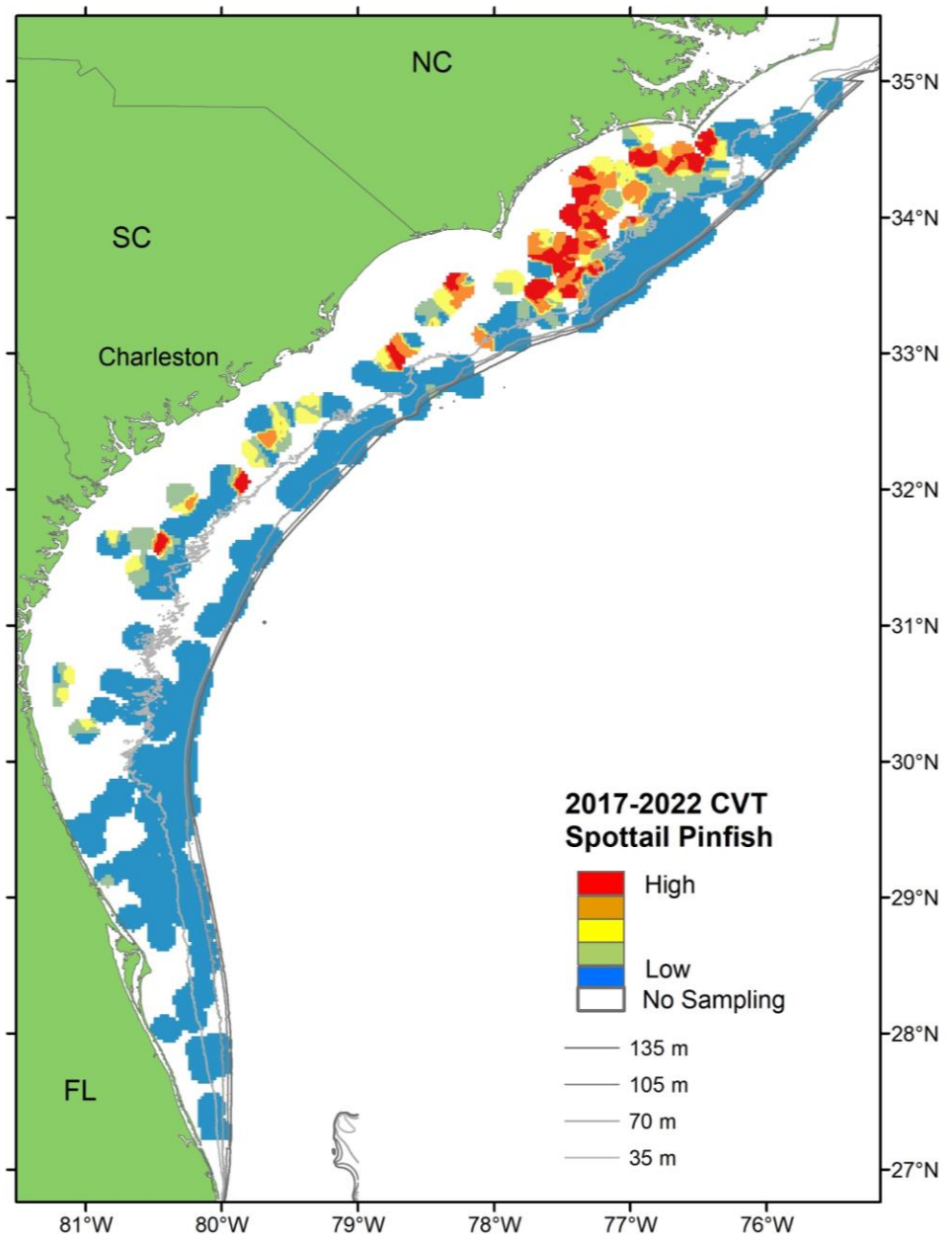
- Number of fish
- Trap soak time

Video:

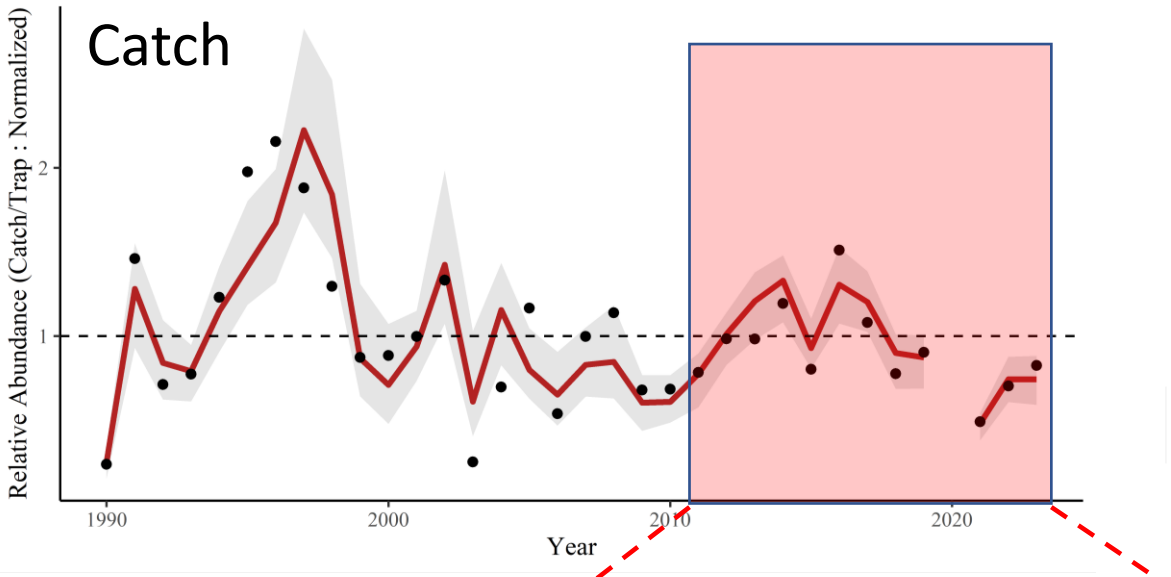
- SumCount
- 10 min after trap lands on bottom
- One snapshot every 30 s for 20 min

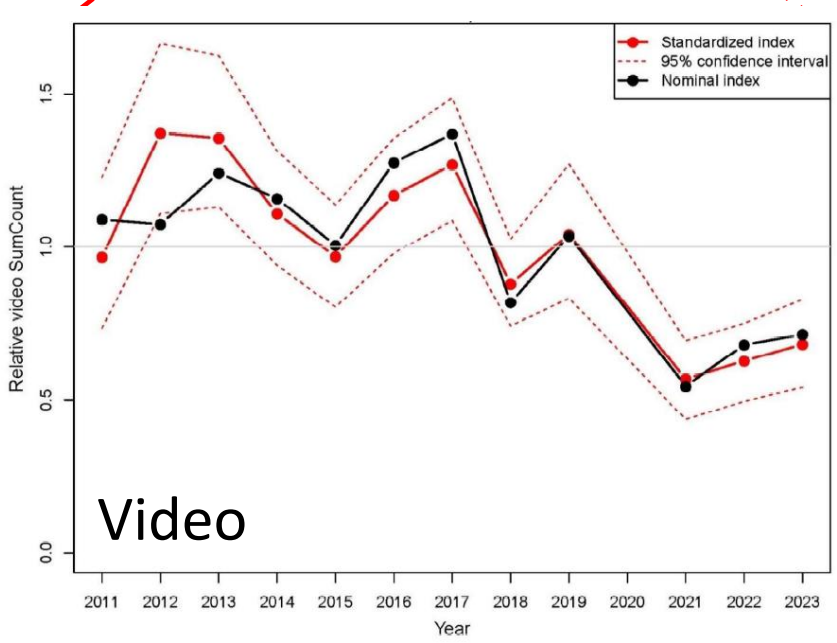
SERFS Distributions- Example

- Only CVT catch
- Catch abundance in quintiles (5 bins)
  - # fish / trap hour
- 5 most recent years: 2018-2019 & 2021-2023
- Cooler colors => lower nominal abundance
- Warmer colors => higher nominal abundance
- White => no sampling



SERFS Indices- Example



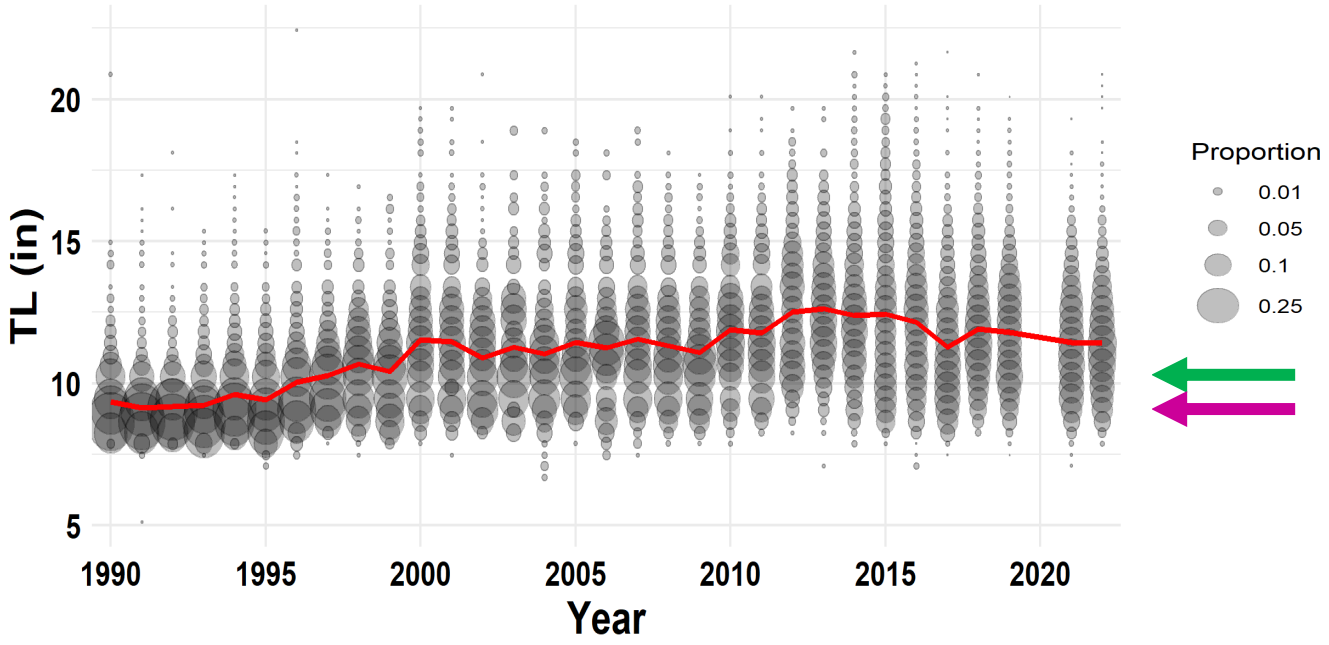


Normalized to long-term average (dashed or solid line at 1)

- 2 = twice long-term average
- 0.5 = half long-term average

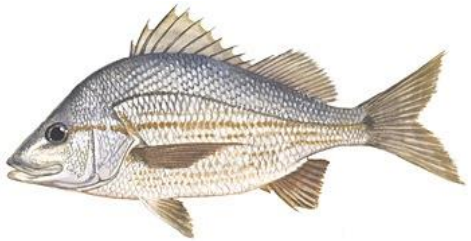
Gear	ZINB Index	95% C.I.	Nominal Values
CHV	Red Line	Gray Shading	Black Dots

SERFS Length Compositions- Example



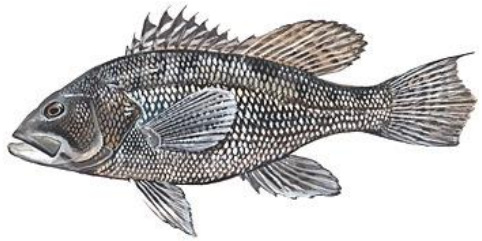
- Catch Only
- Maximum (Pinched) Total Length (in)
- 1-in Length Bins
- Bubble size = # fish in length bin / # fish measured in a year
- Red Line = Average TL
- Green Arrow = Commercial MSL
- Pink Arrow = TL at 50% Maturity, Female
- "Missing" length bins in some graphs are result of converting between FL & TL and rounding

Selected Species
2023 CVT Catch Rankings

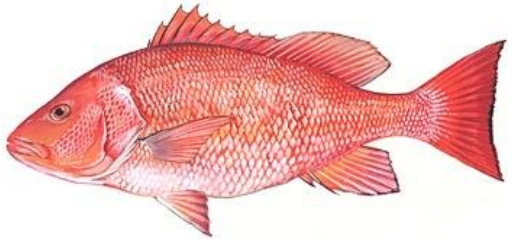


1. Tomtate*

2. Vermilion Snapper



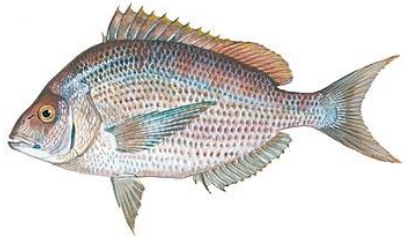
3. Black Sea Bass



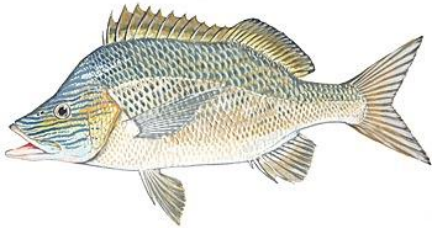
4. Red Snapper

5. Gray Triggerfish

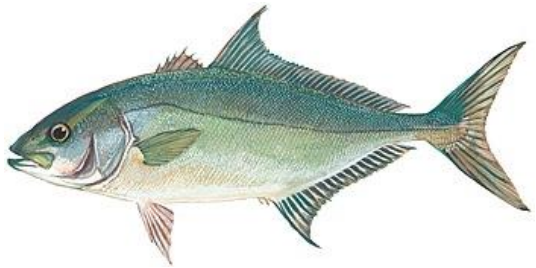
6. Red Porgy



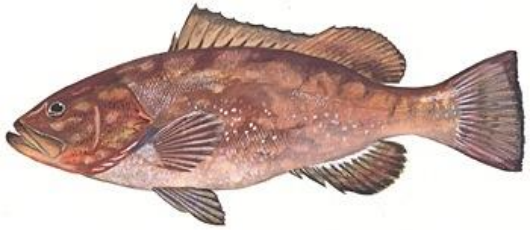
7. *Stenotomus* spp.*



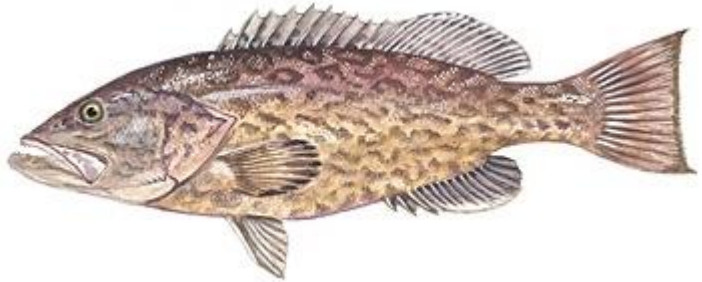
8. White Grunt



16. Almaco Jack

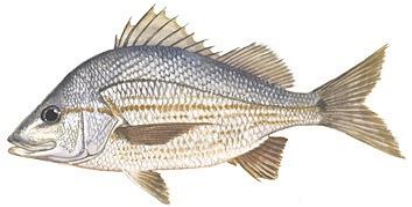


17. Red Grouper

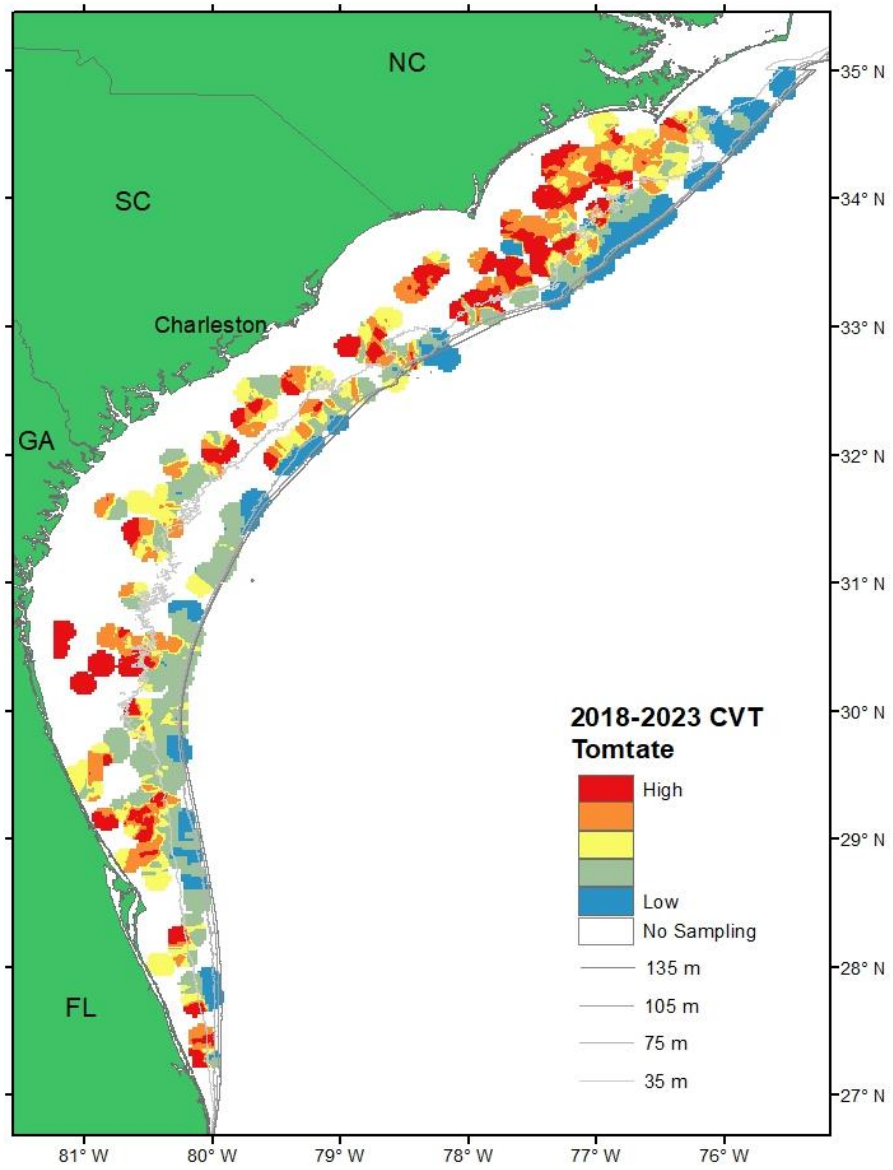


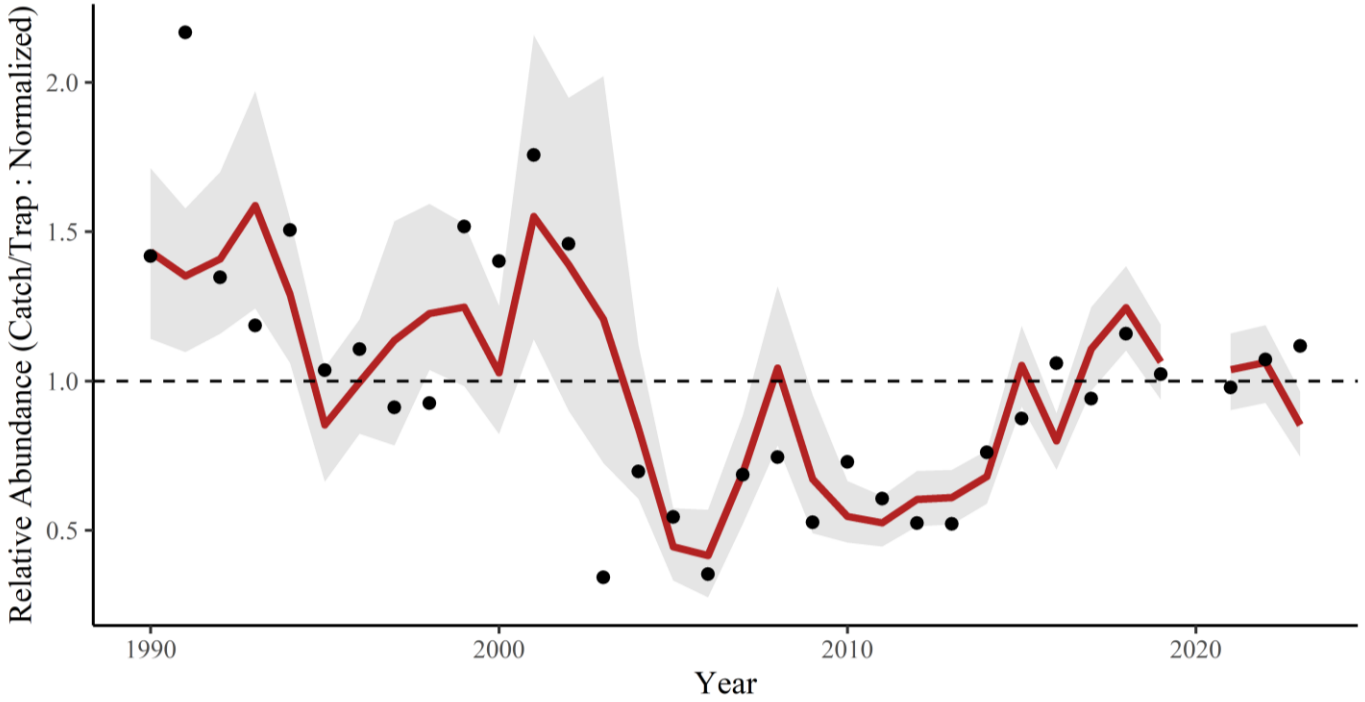
21. Gag

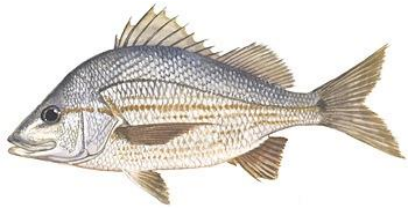
23. Scamp



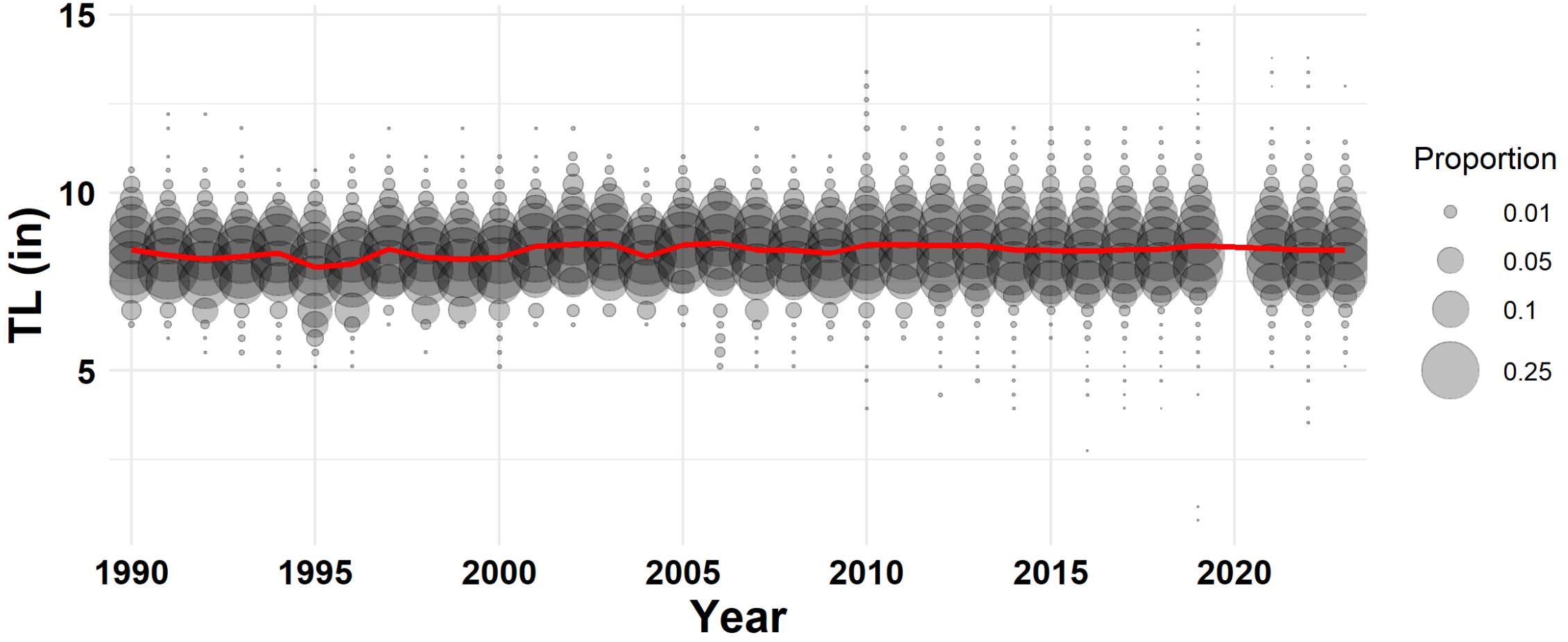
Tomtate

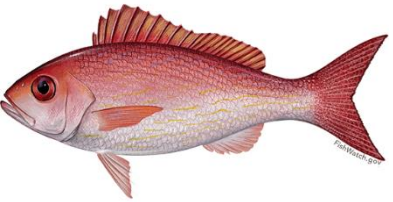

NC
SC
Charleston
GA
FL
2018-2023 CVT
Tomtate
High
Low
No Sampling
135 m
105 m
75 m
35 m
35° N
34° N
33° N
32° N
31° N
30° N
29° N
28° N
27° N
81° W
80° W
79° W
78° W
77° W
76° W


Relative Abundance (Catch/Trap : Normalized)
2.0
1.5
1.0
0.5
1990
2000
2010
2020
Year

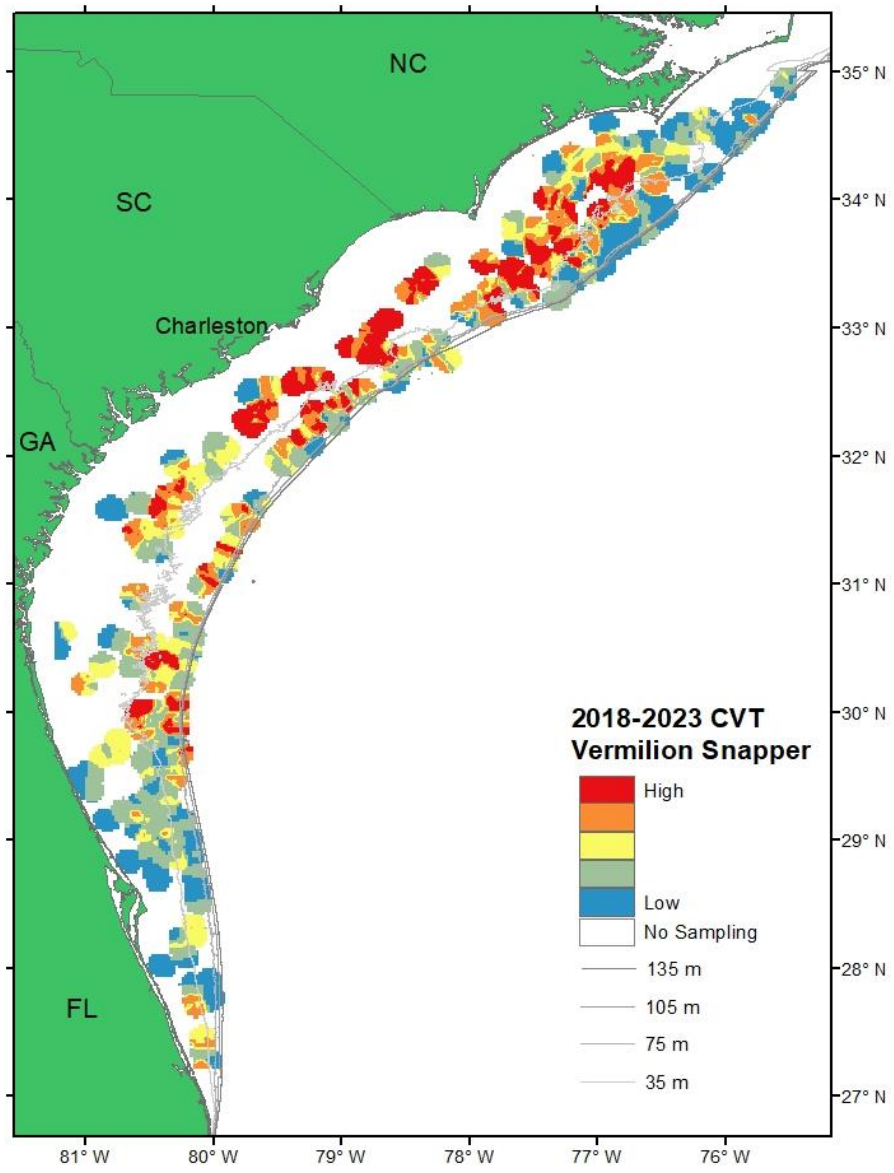


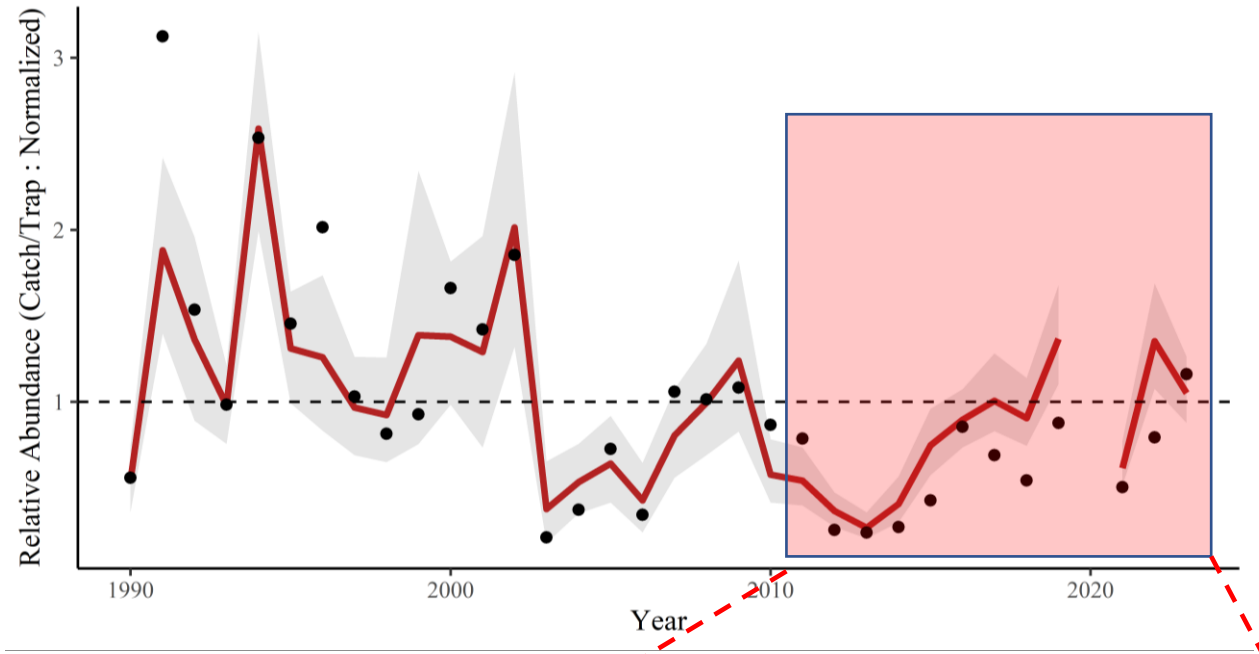
Tomtate

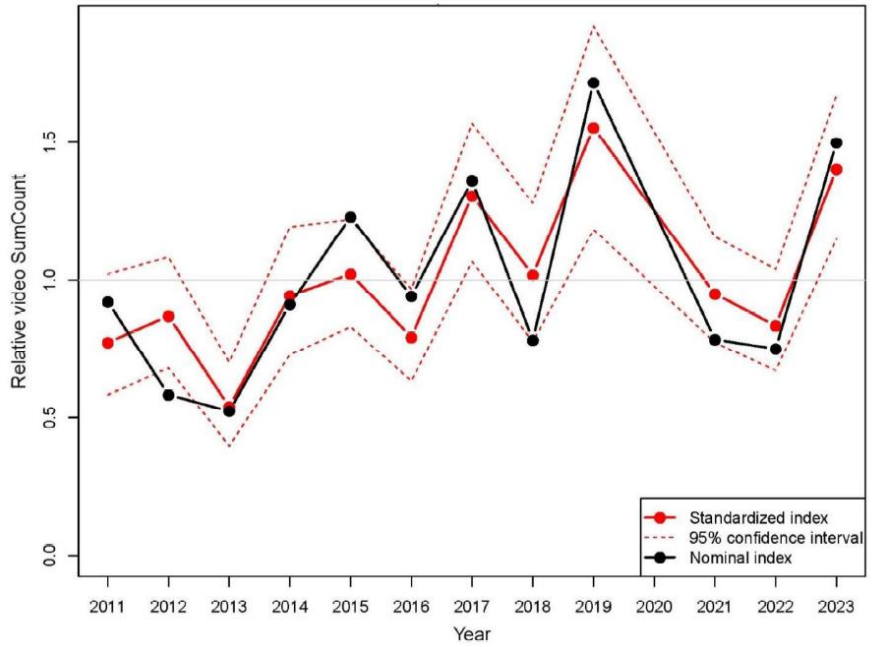

15
10
5
TL (in)
1990
1995
2000
2005
2010
2015
2020
Year
Proportion
0.01
0.05
0.1
0.25

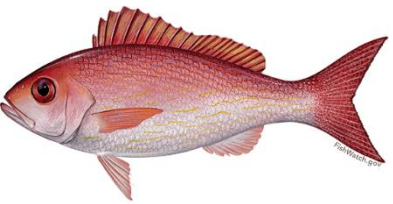


Vermilion Snapper









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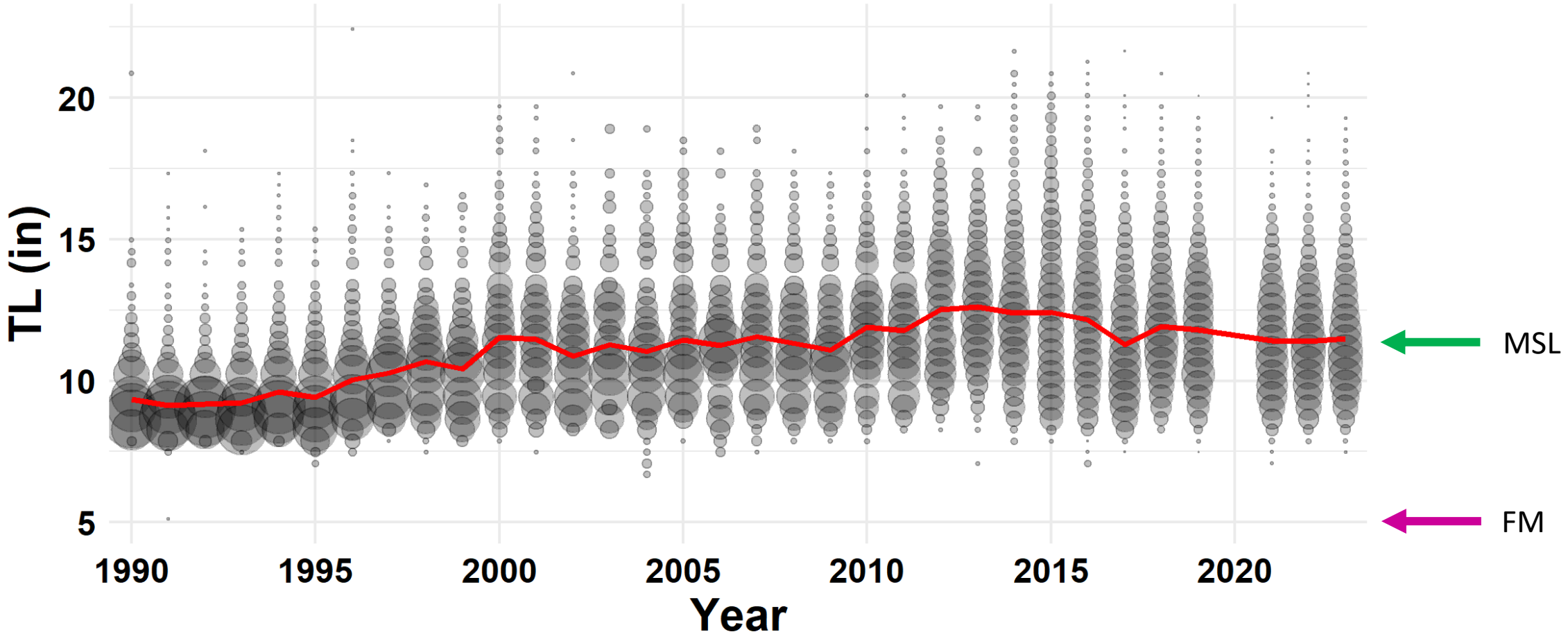
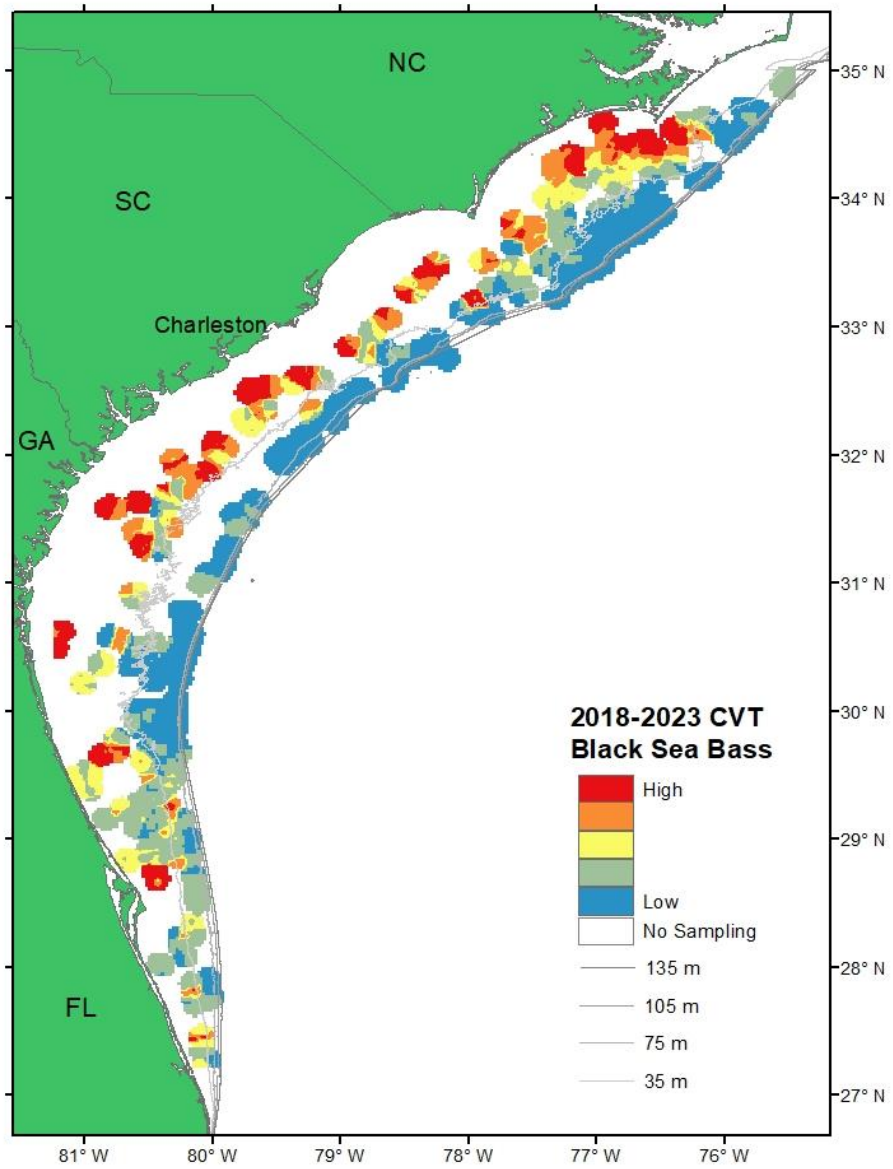
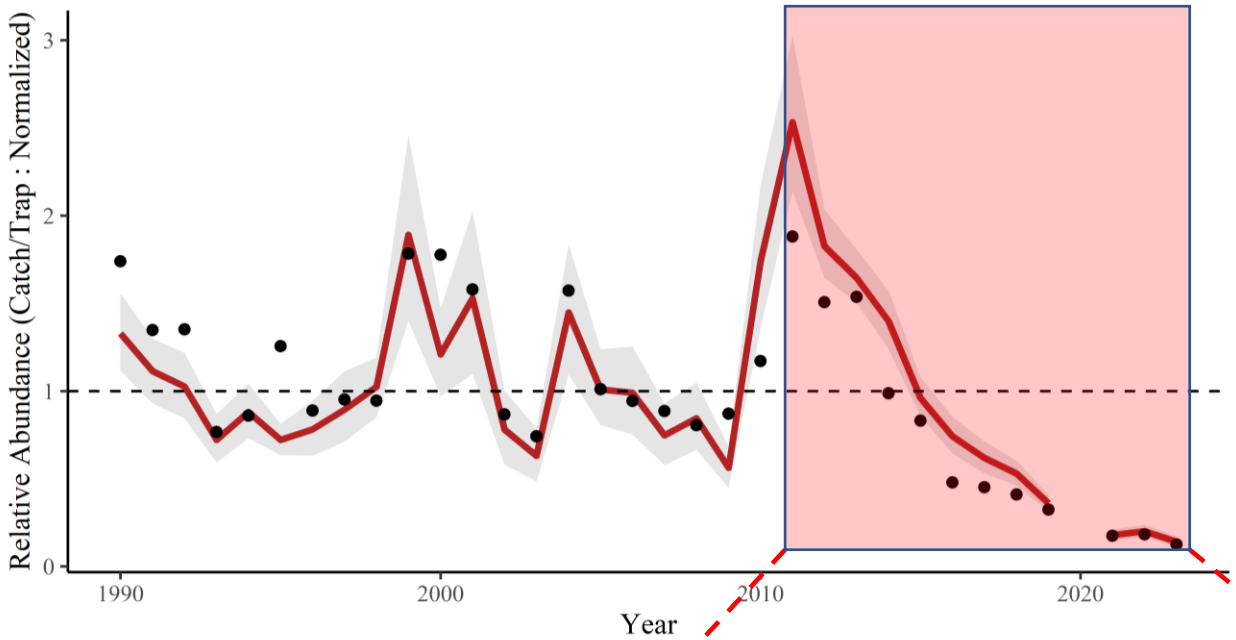
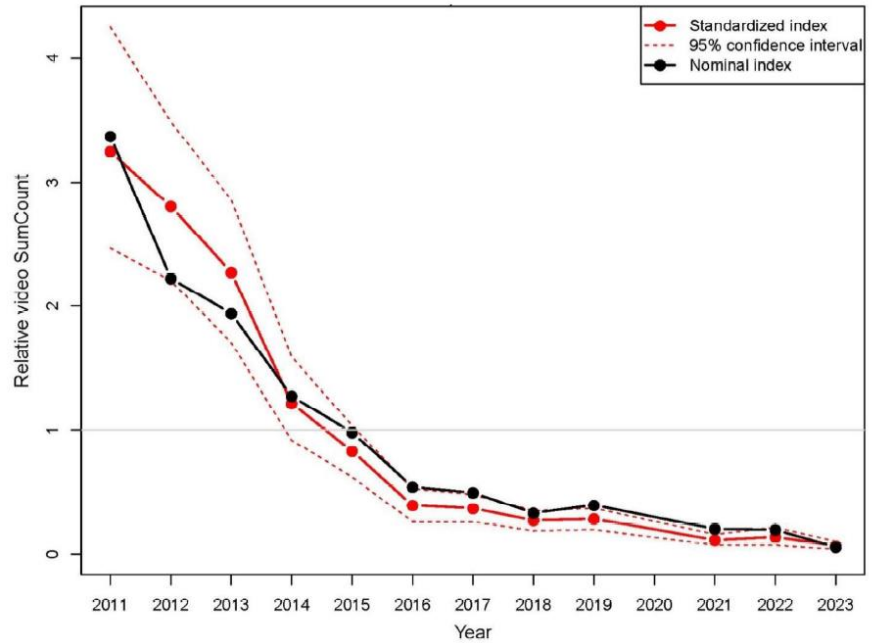


Black Sea Bass







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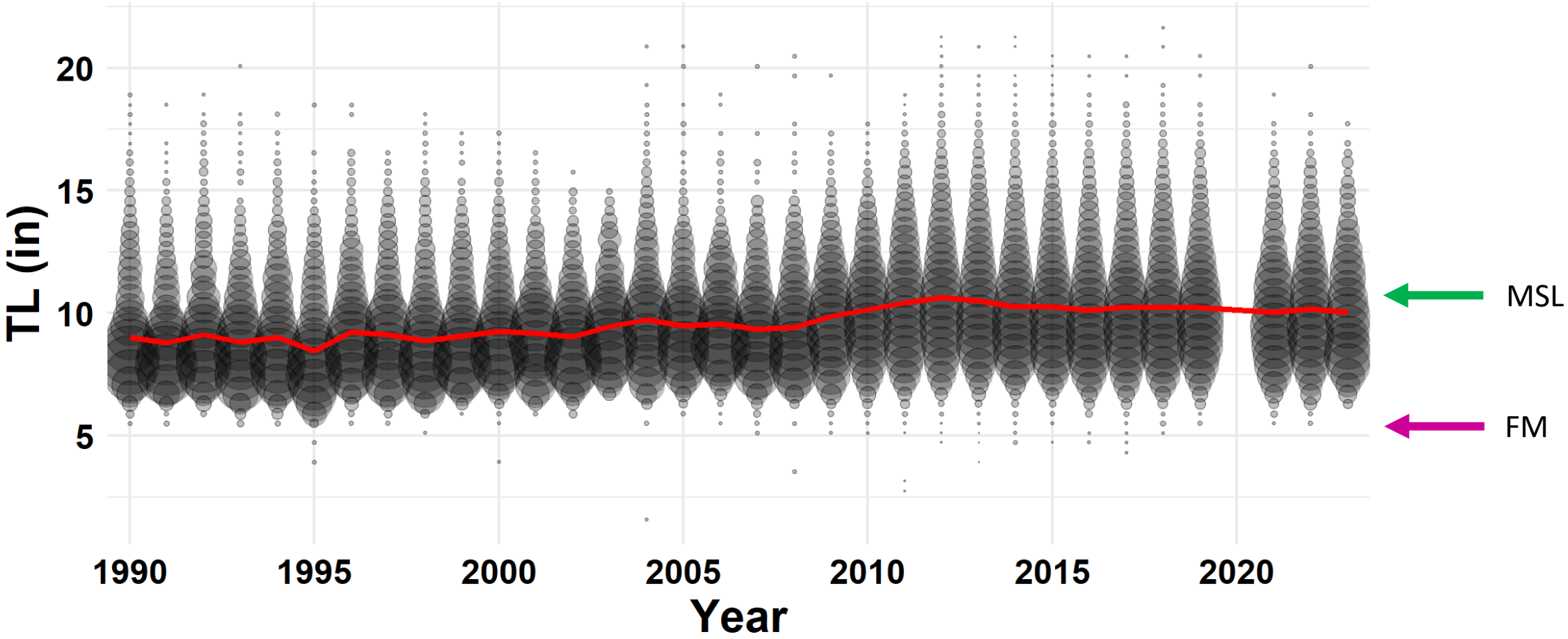
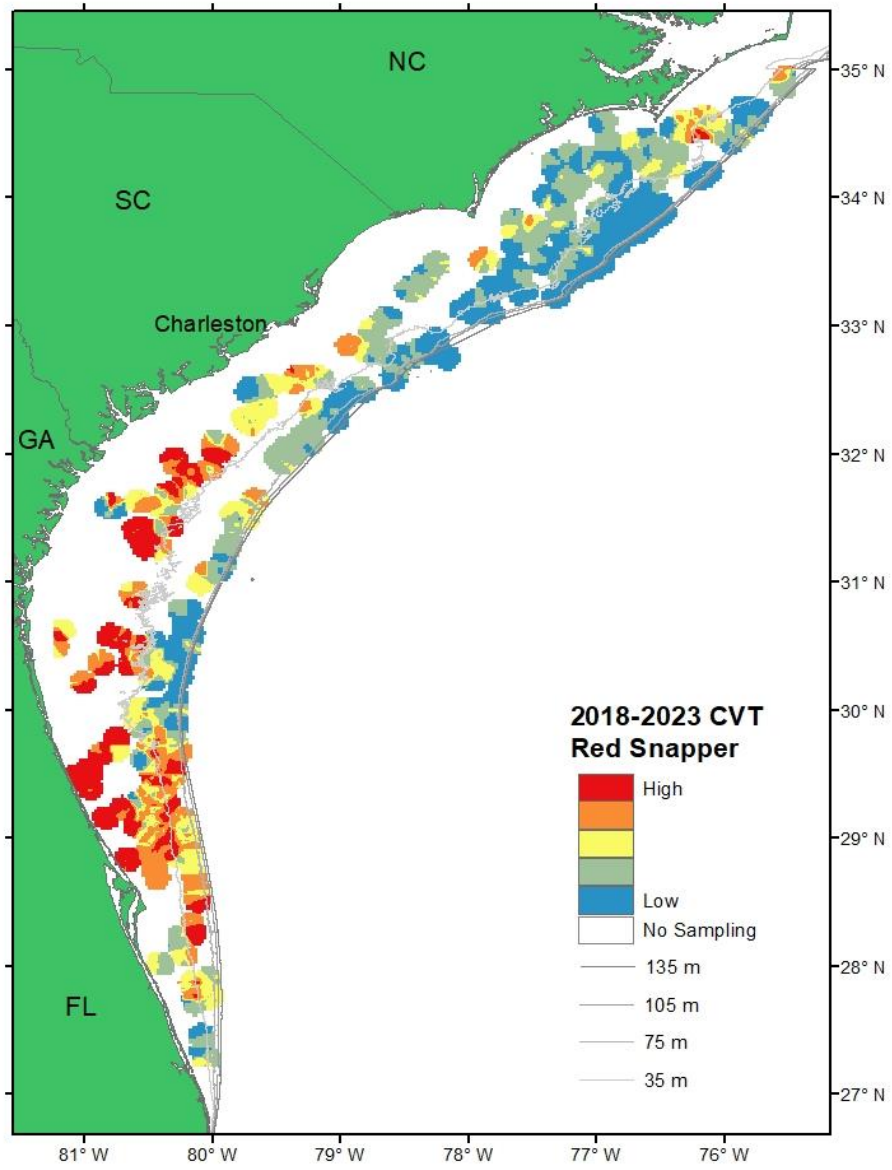


Red Snapper


NC
SC
Charleston
GA
FL
35° N
34° N
33° N
32° N
31° N
30° N
29° N
28° N
27° N
81° W
80° W
79° W
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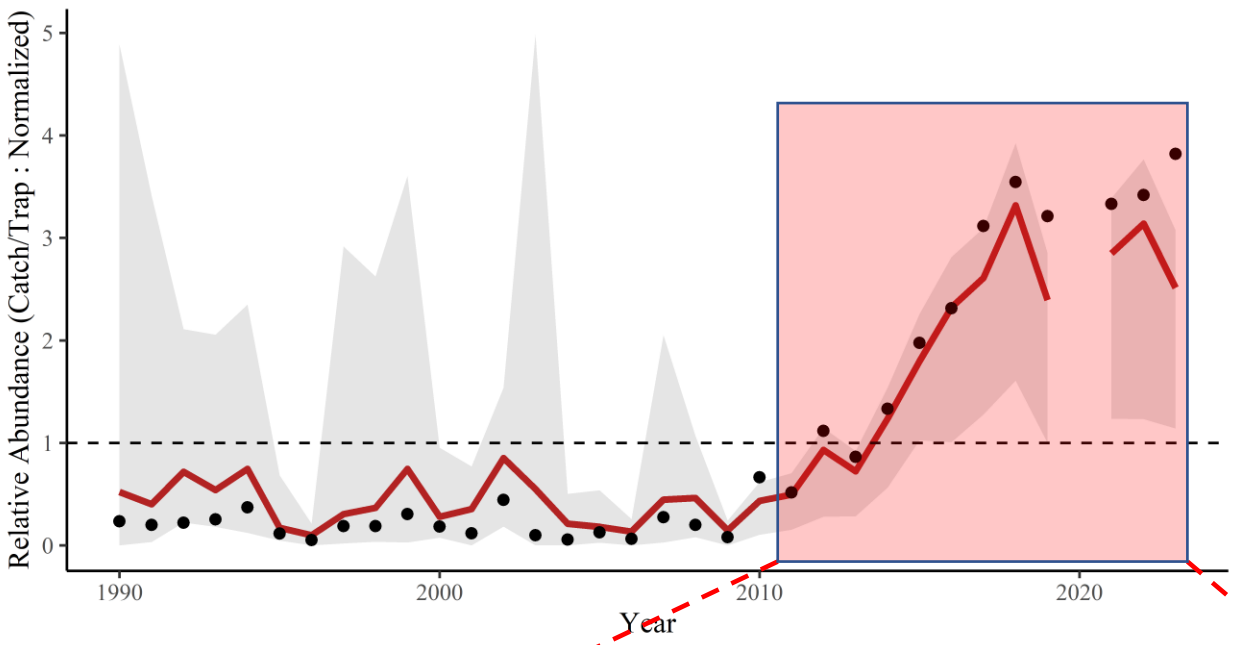
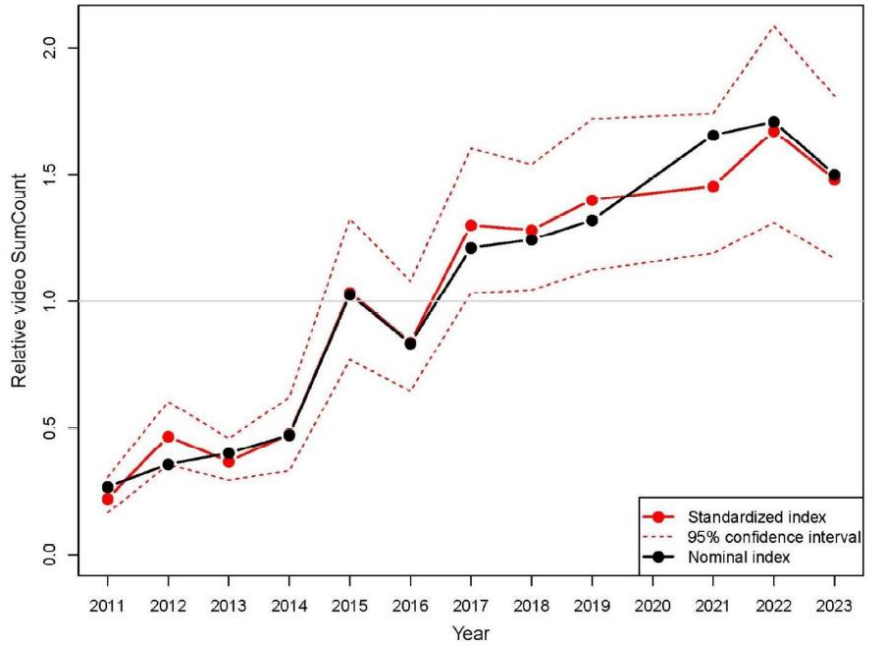
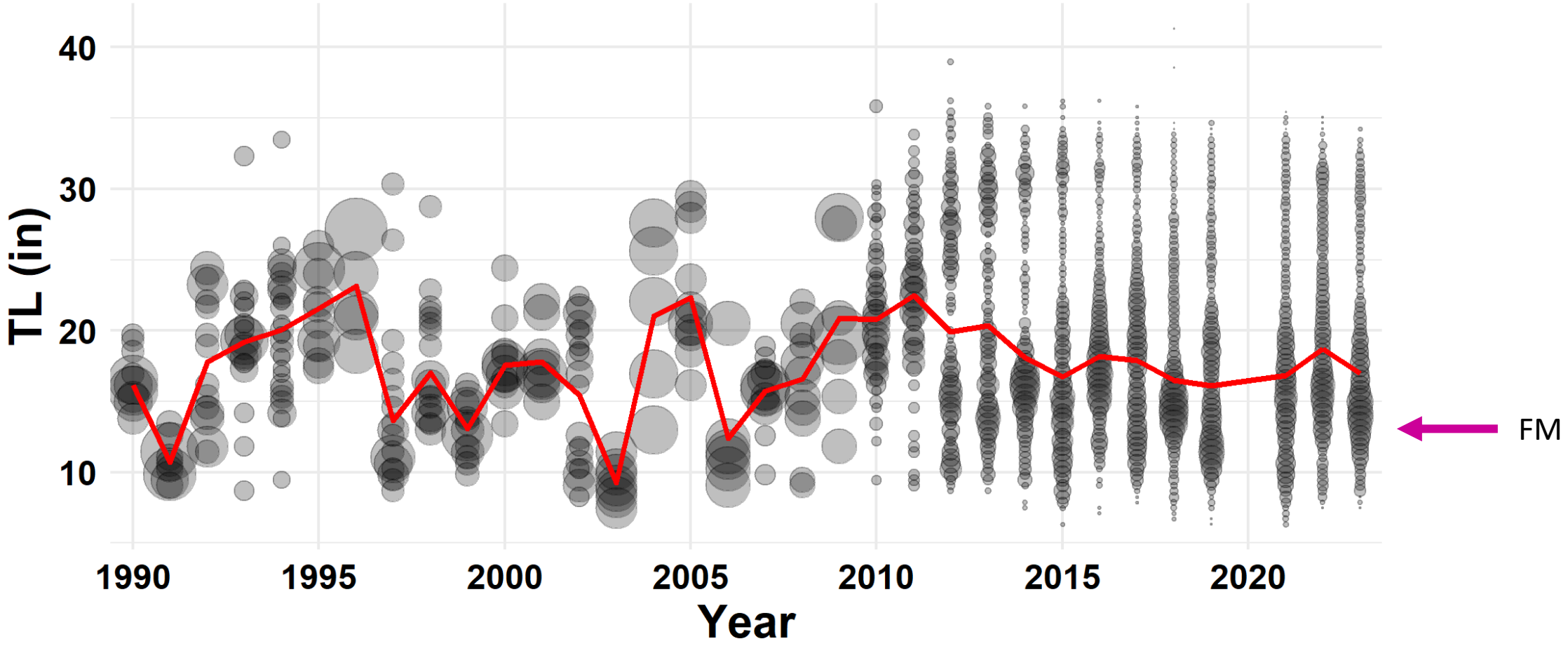
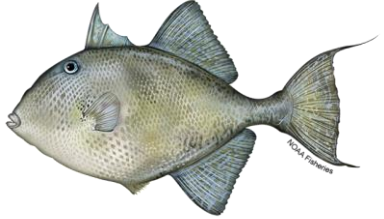
77° W
76° W
2018-2023 CVT
Red Snapper
High
Low
No Sampling
135 m
105 m
75 m
35 m


Relative Abundance (Catch/Trap : Normalized)
0
1
2
3
4
5
1990
2000
2010
2020
Year

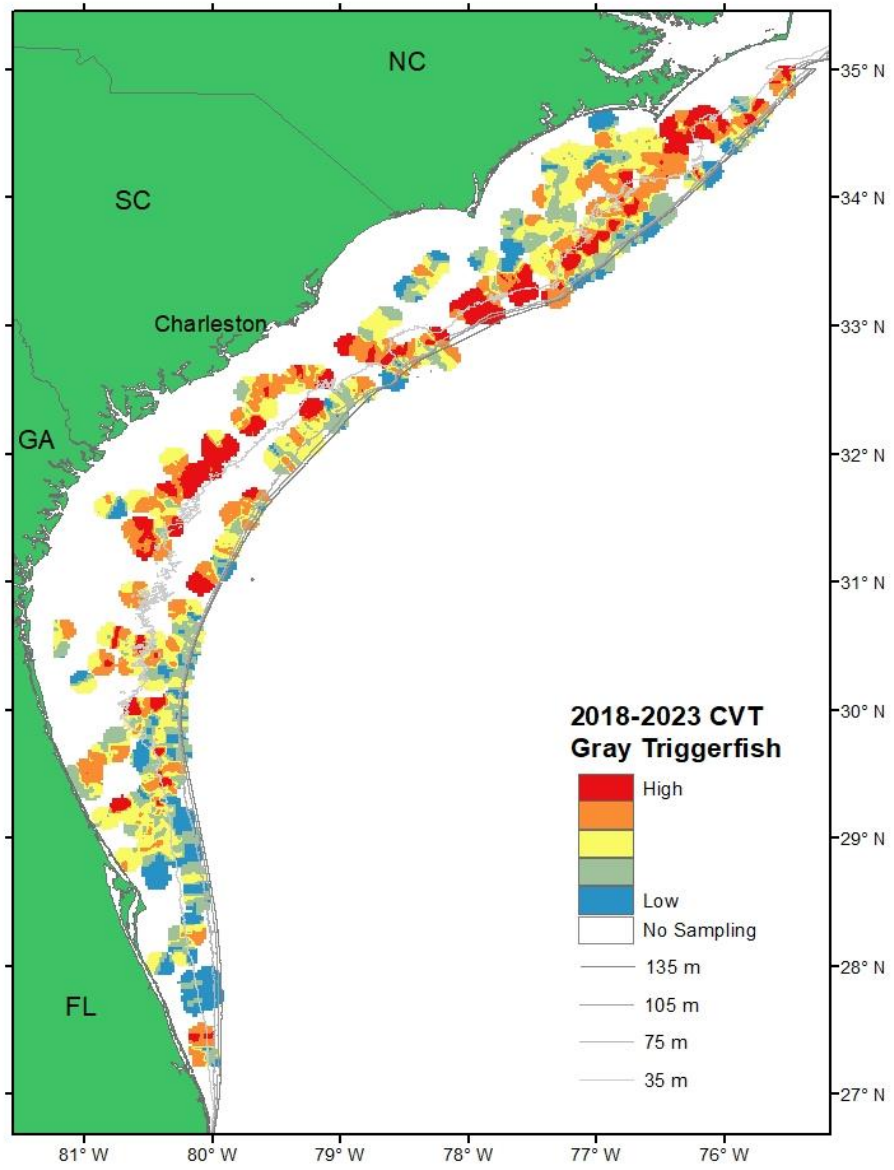

Relative video SumCount
0.0
0.5
1.0
1.5
2.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year
Standardized index
95% confidence interval
Nominal index

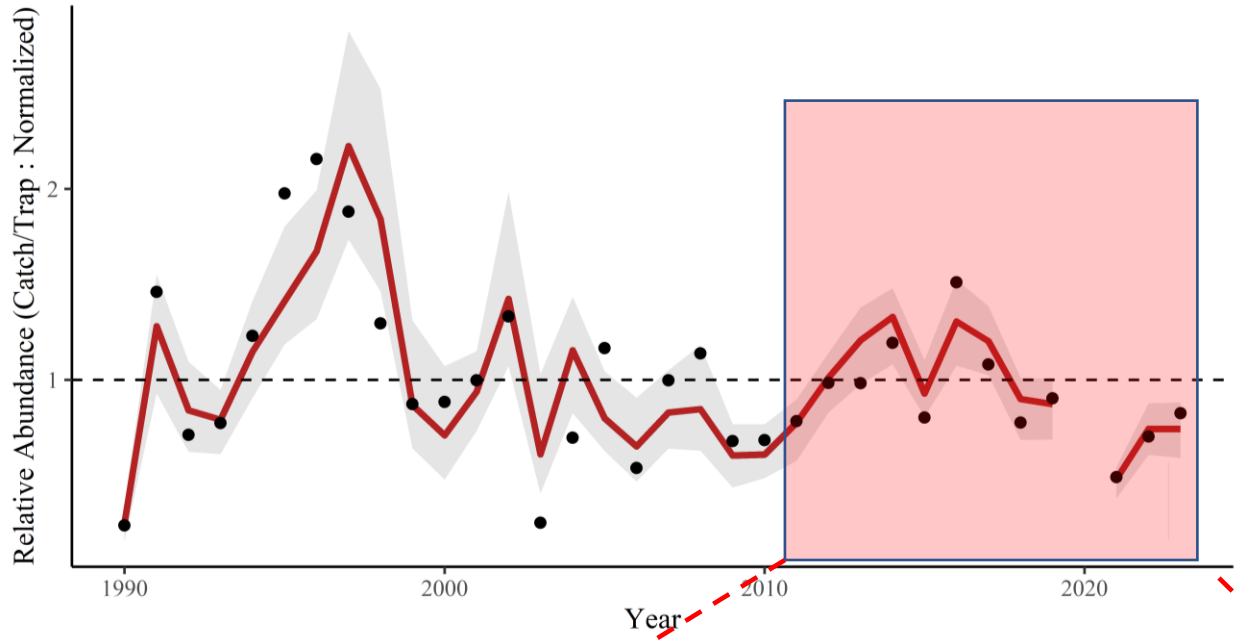
Red Snapper

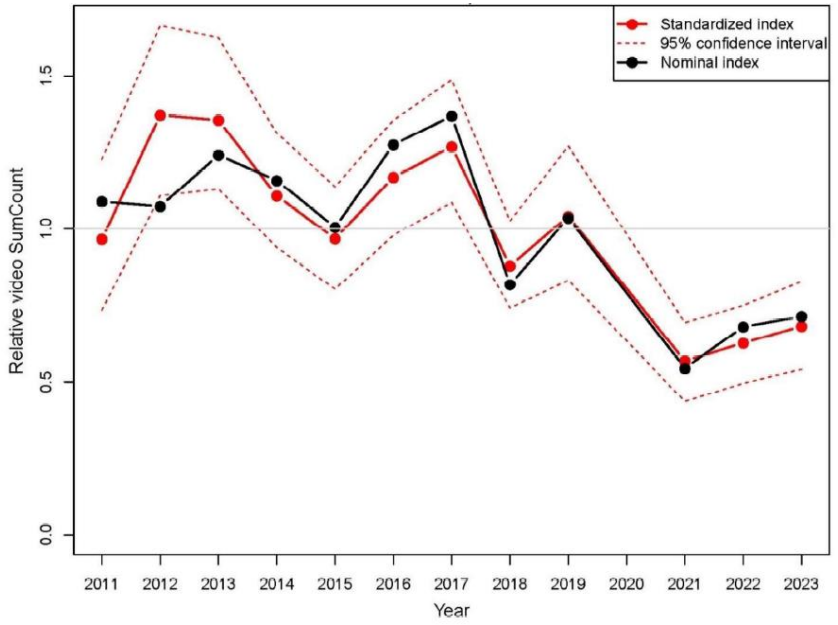


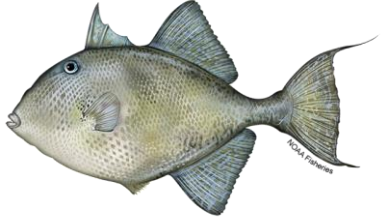


Gray Triggerfish









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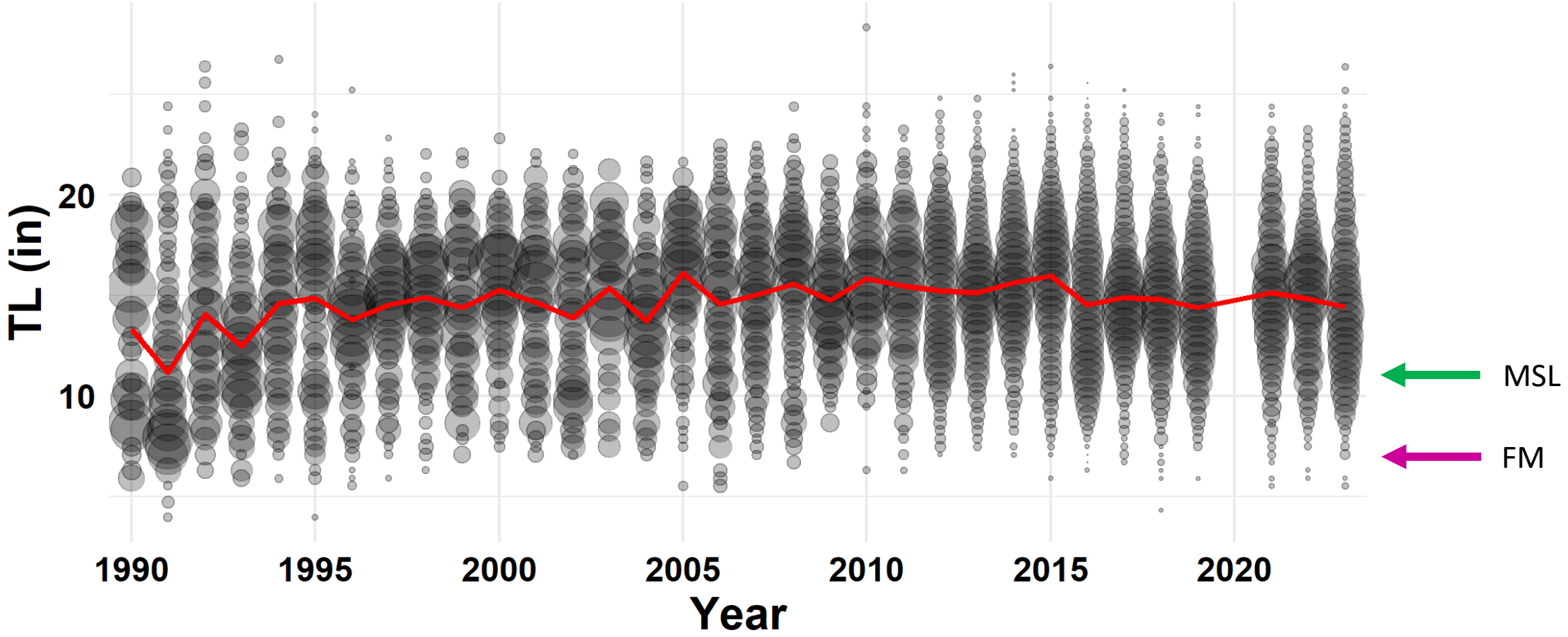
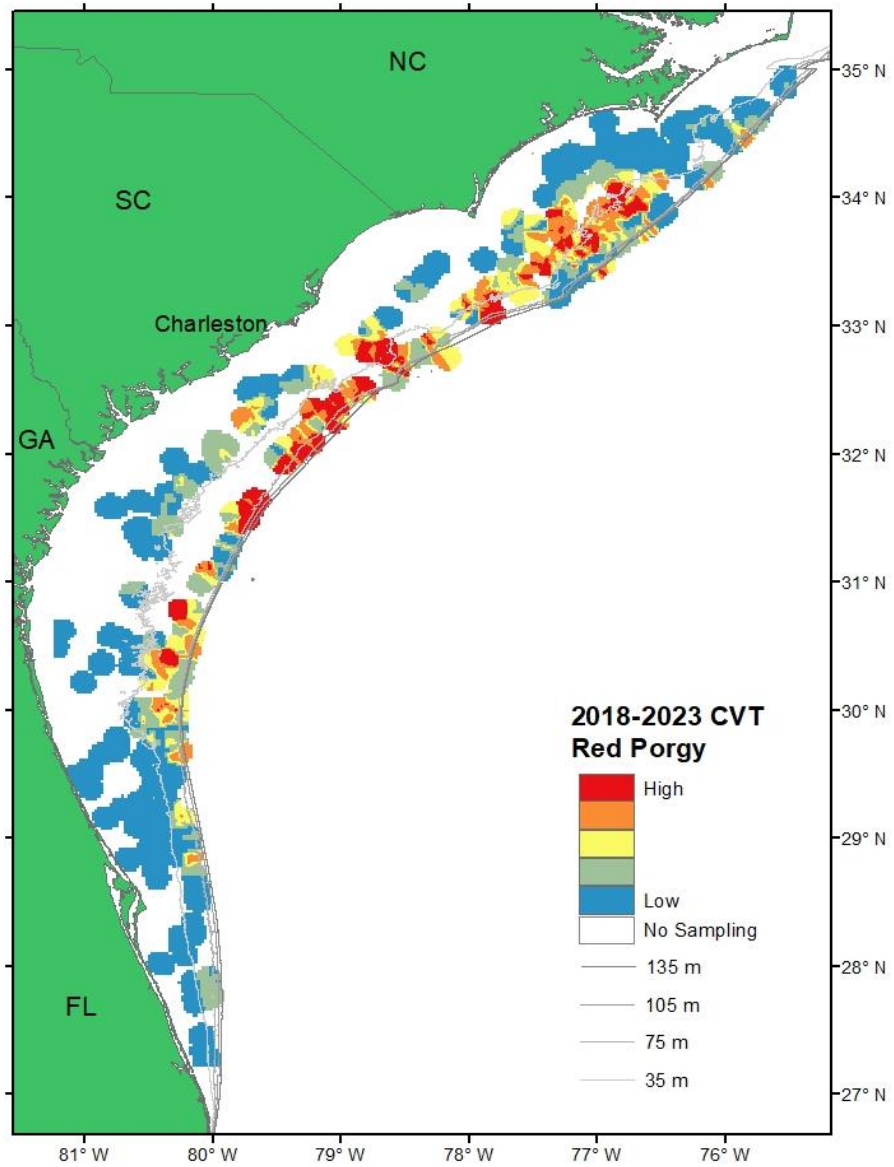


Red Porgy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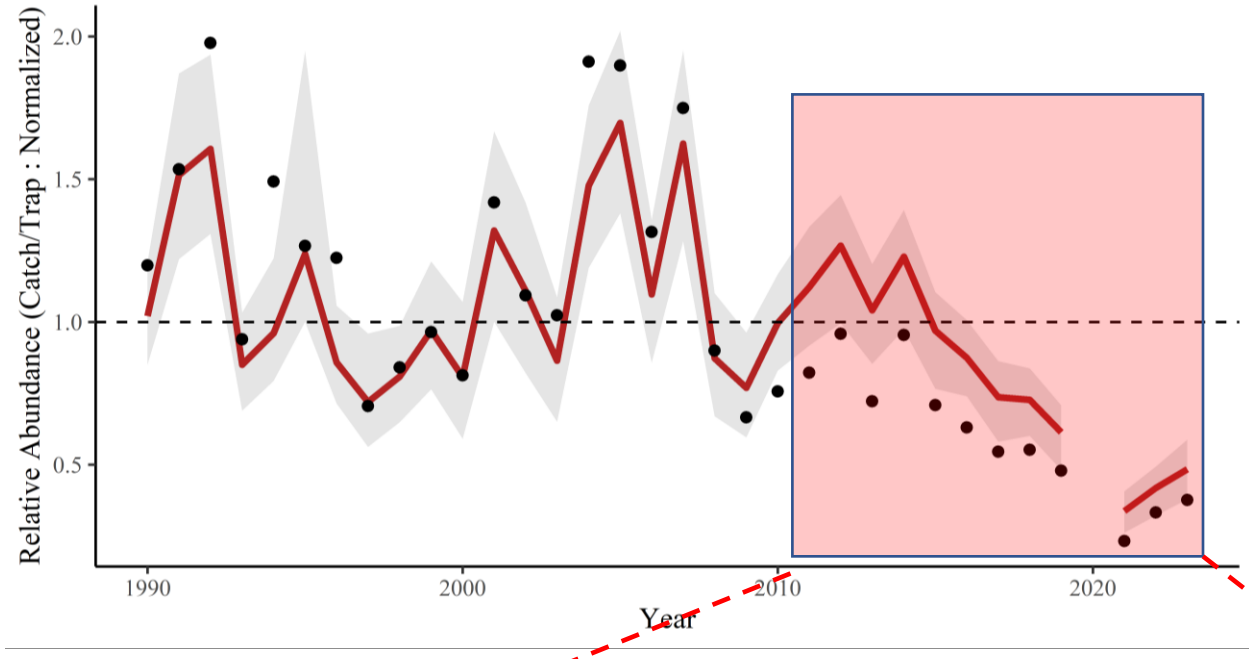
77° W
76° W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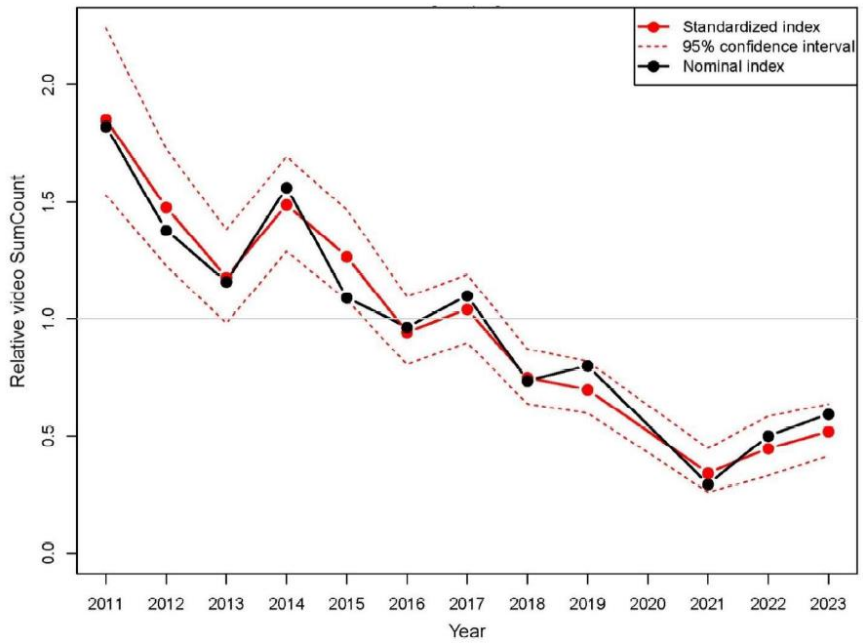
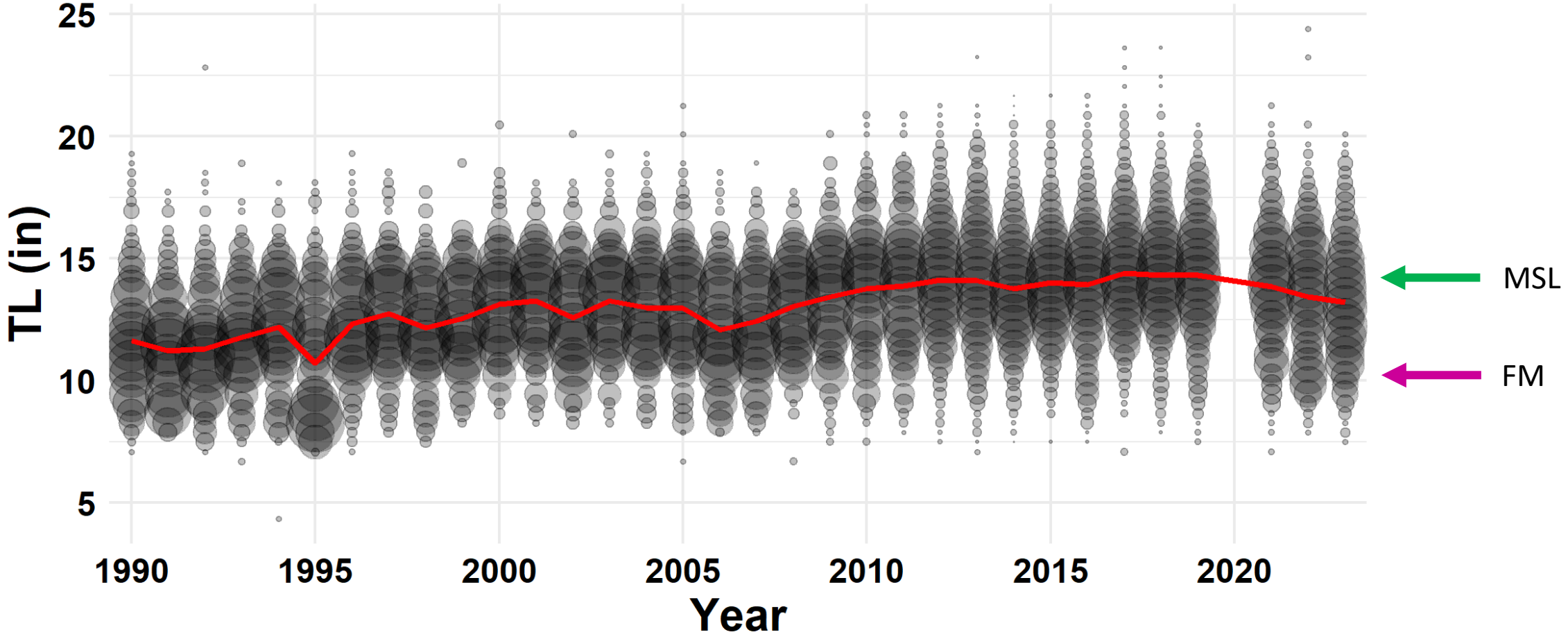
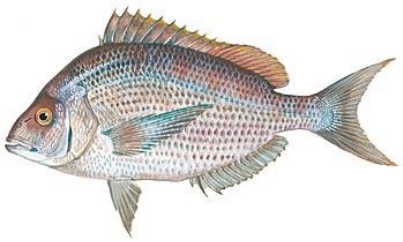
Year

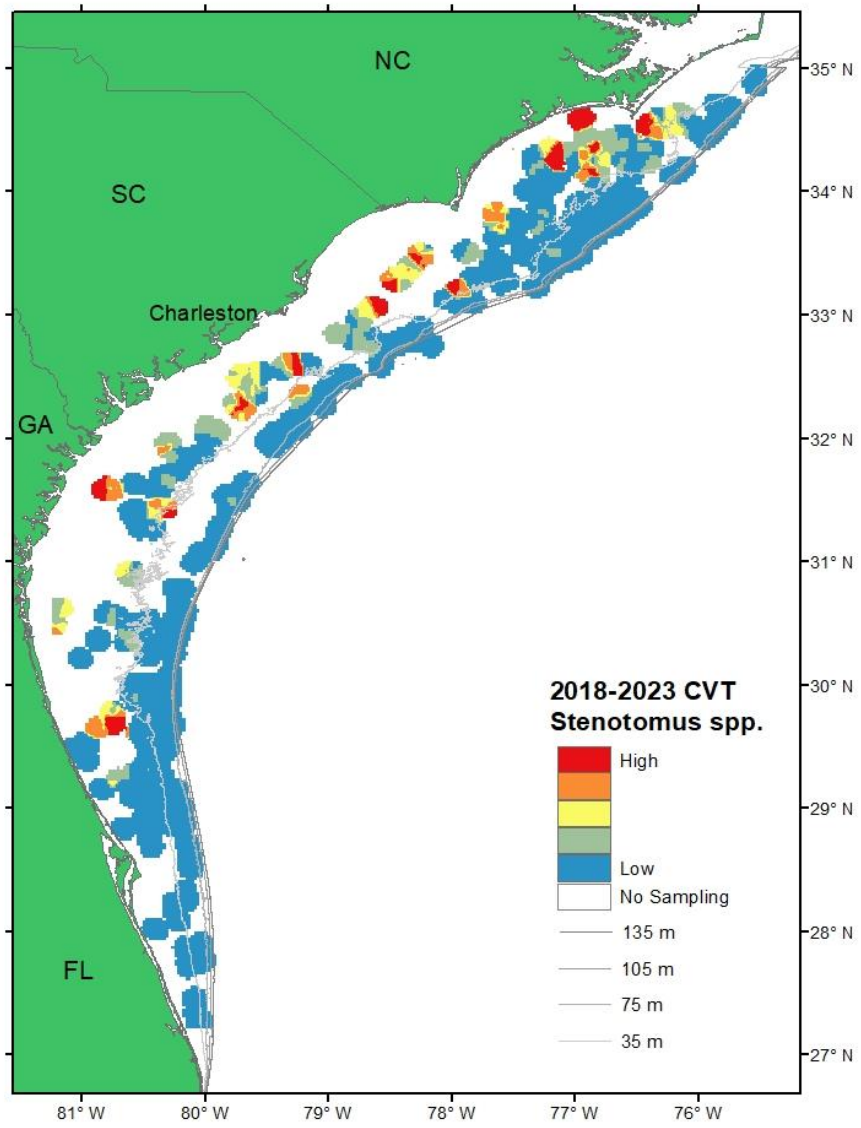

Standardized index
95% confidence interval
Nominal index
Relative viceo SumCount
2.0
1.5
1.0
0.5
0.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year

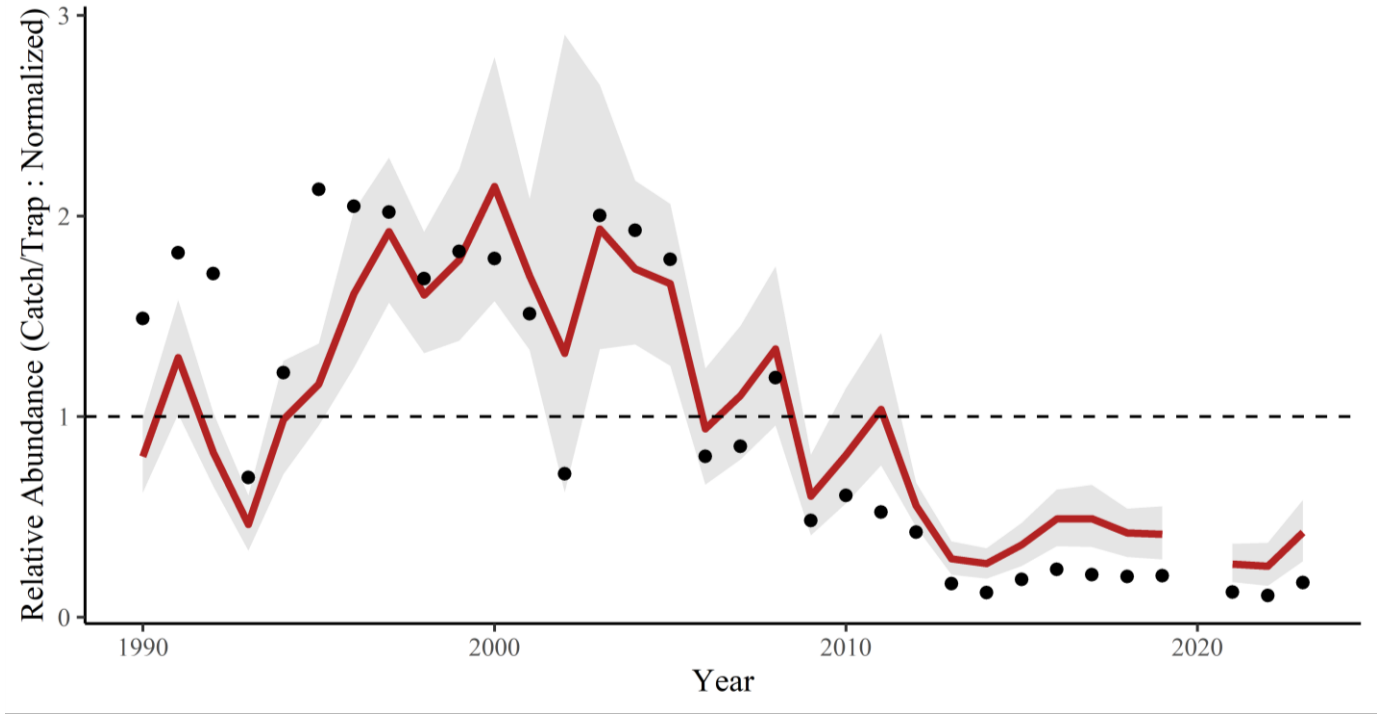
Red Porgy

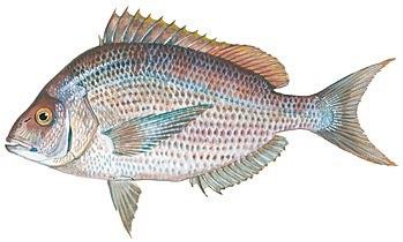

25
20
15
10
5
TL (in)
1990
1995
2000
2005
2010
2015
2020
Year
MSL
FM



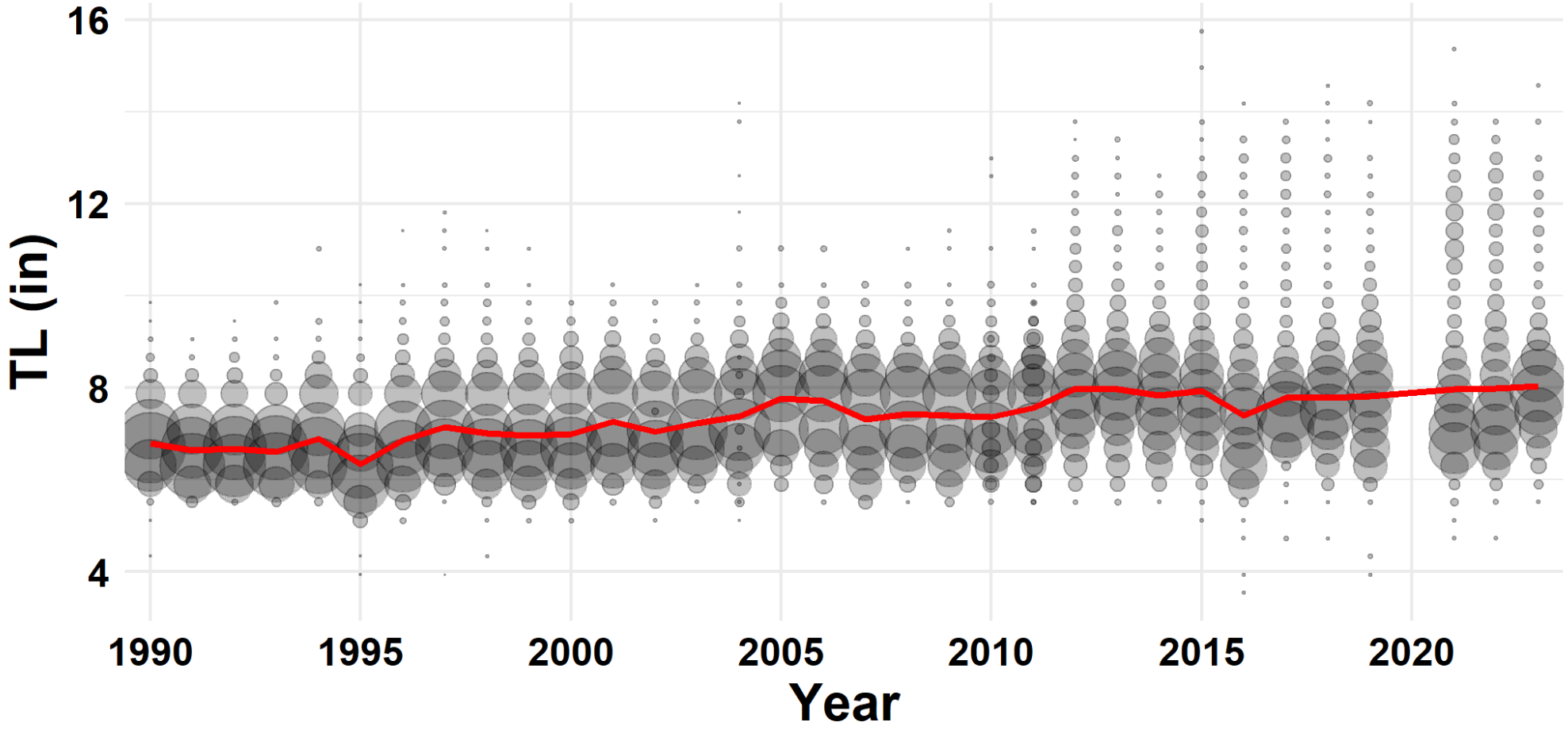
Stenotomus spp.

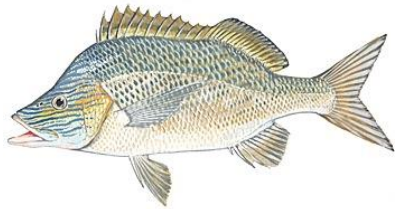




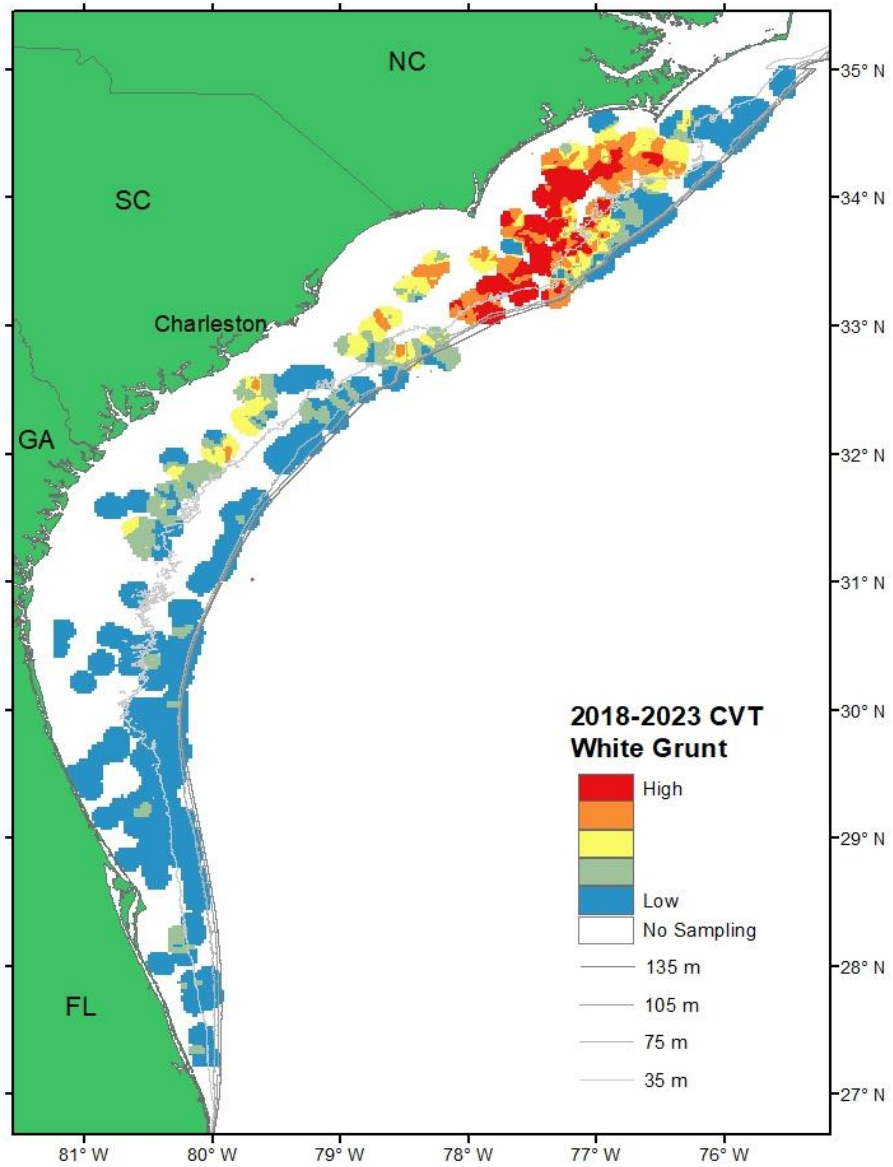


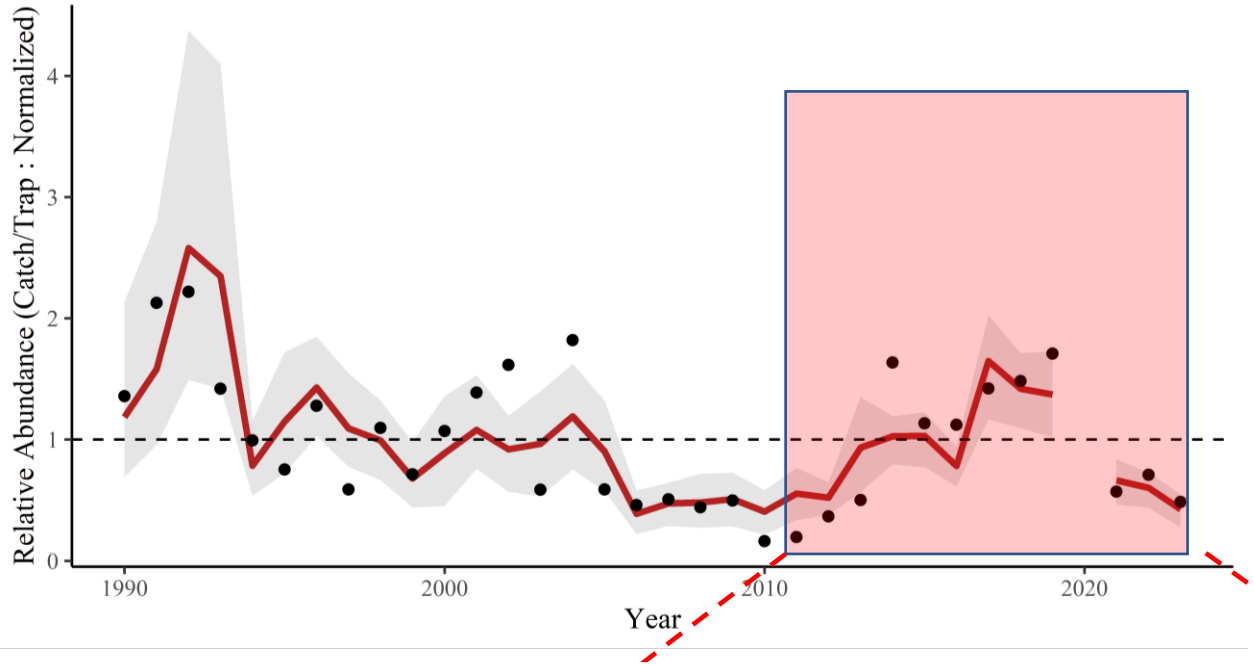
Stenotomus spp.

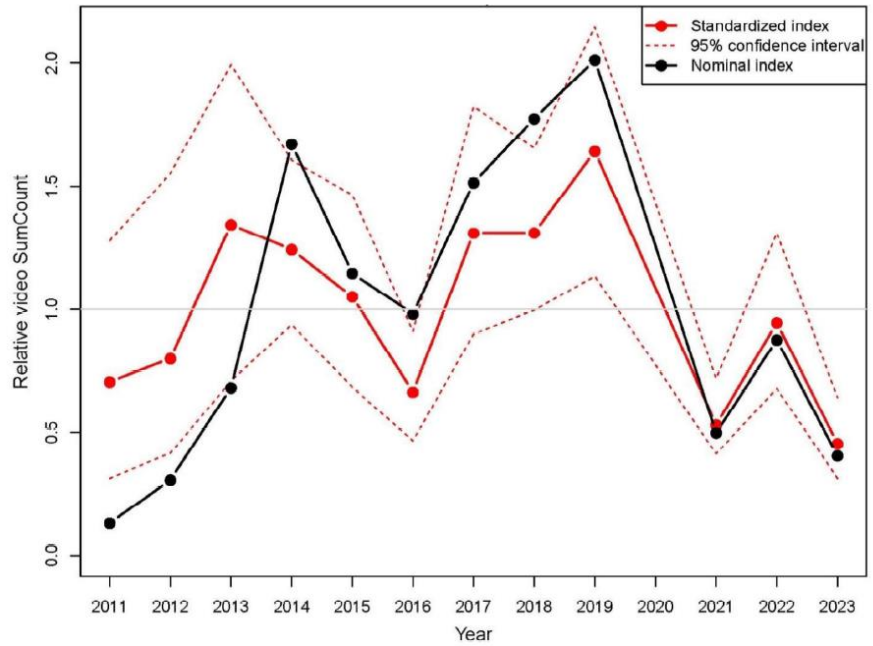


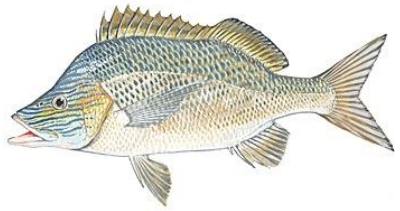


White Grunt

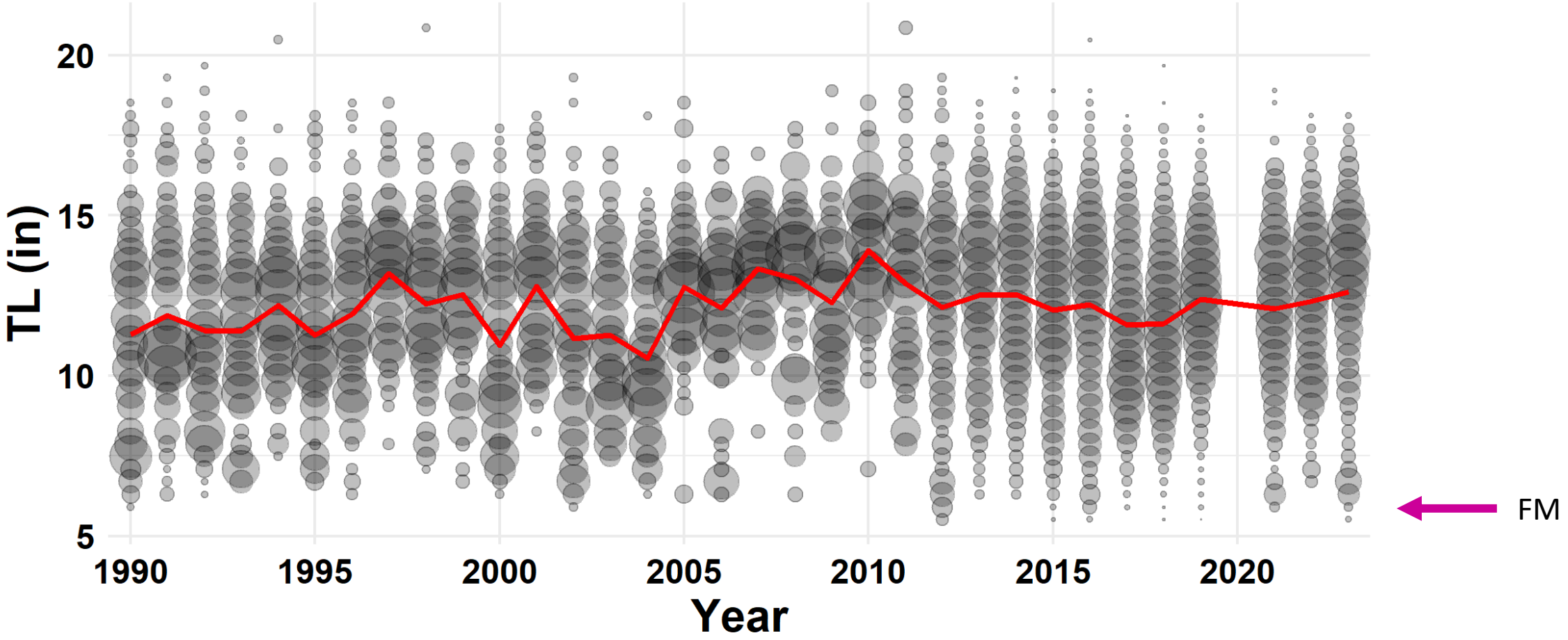

NC
SC
Charleston
GA
FL
35° N
34° N
33° N
32° N
31° N
30° N
29° N
28° N
27° N
81° W
80° W
79° W
78° W
77° W
76° W
2018-2023 CVT
White Grunt
High
Low
No Sampling
135 m
105 m
75 m
35 m

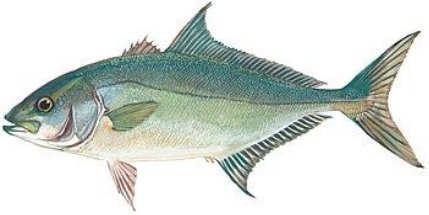

Relative Abundance (Catch/Trap : Normalized)
0
1
2
3
4
1990
2000
2010
2020
Year


Standardized index
95% confidence interval
Nominal index
Relative viceo SumCount
0.0
0.5
1.0
1.5
2.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year

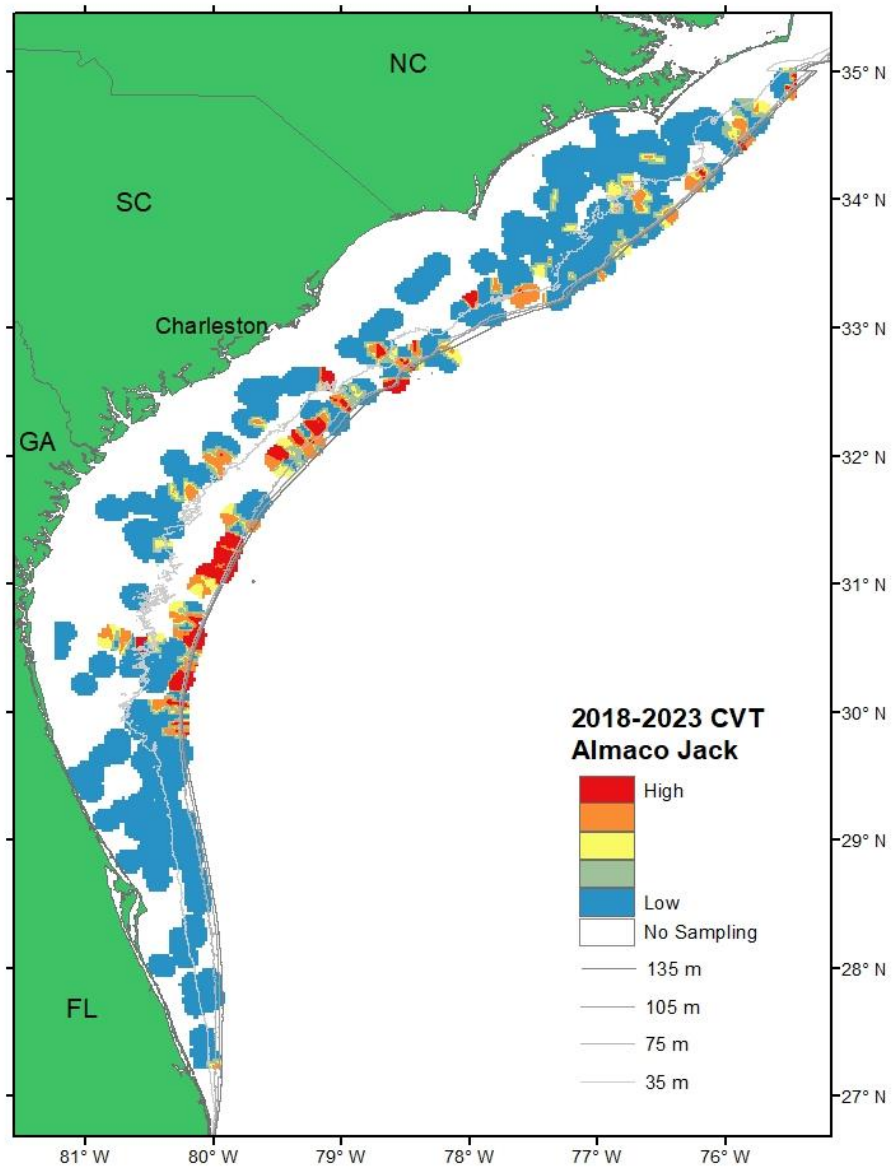


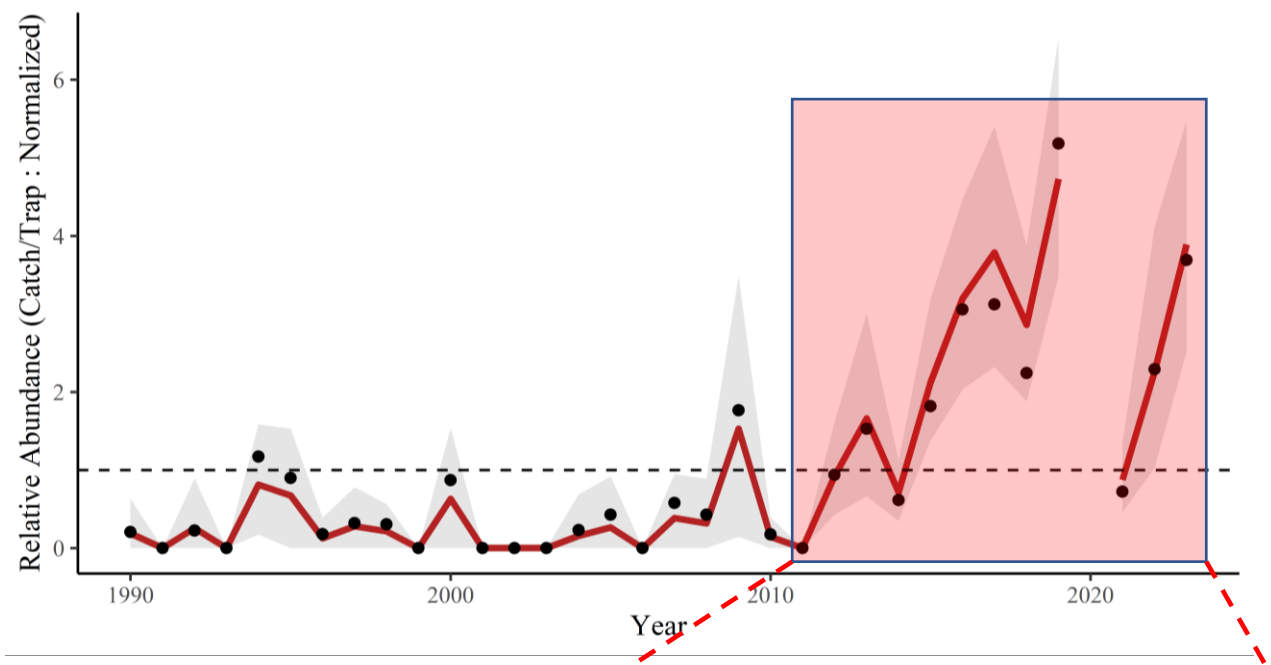
White Grunt

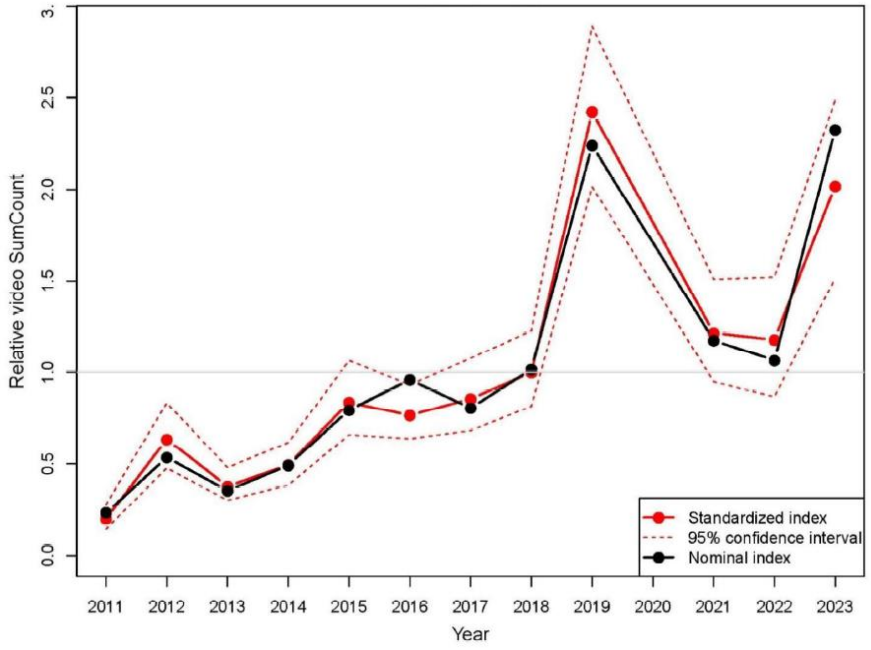


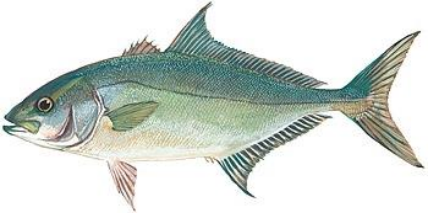


Almaco Jack

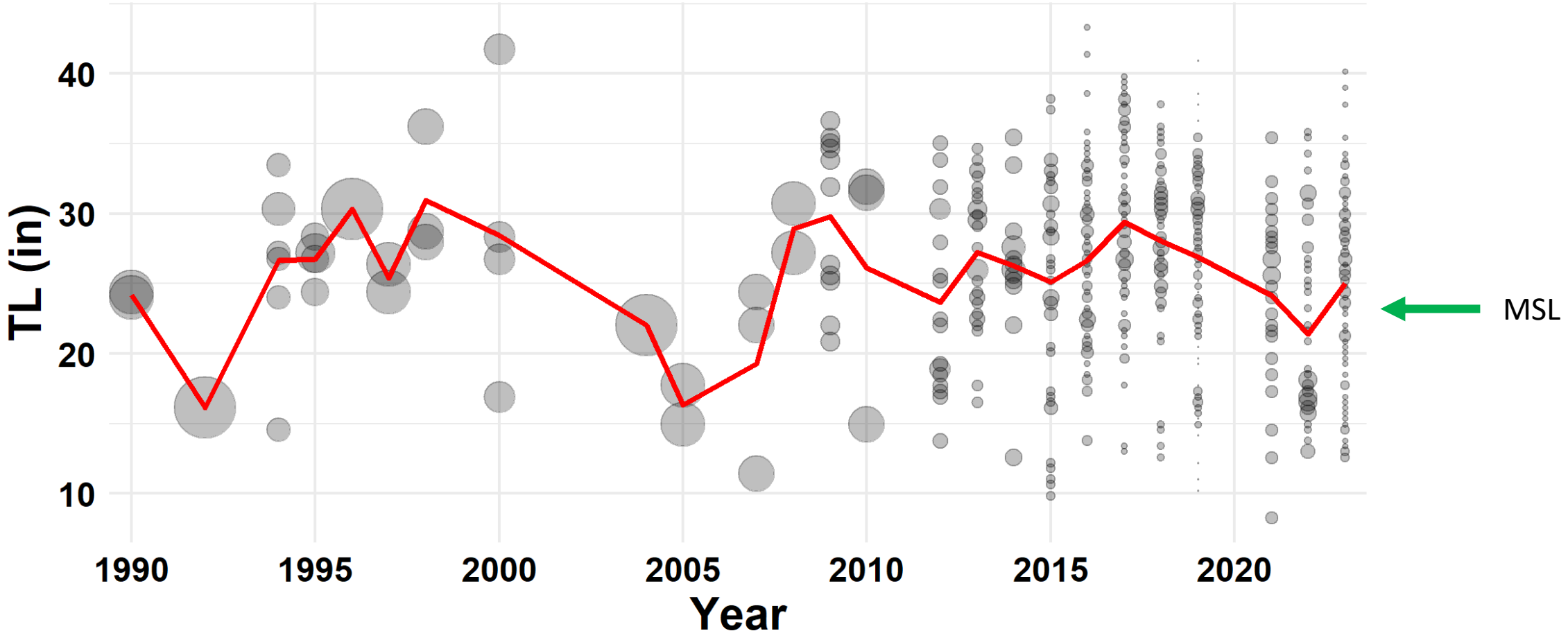

NC
SC
Charleston
GA
FL
2018-2023 CVT
Almaco Jack
High
Low
No Sampling
135 m
105 m
75 m
35 m
35° N
34° N
33° N
32° N
31° N
30° N
29° N
28° N
27° N
81° W
80° W
79° W
78° W
77° W
76° W

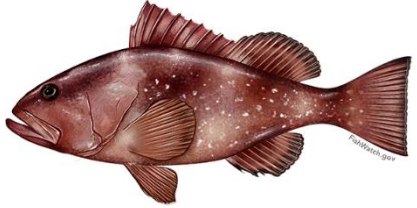

Relative Abundance (Catch/Trap : Normalized)
0
2
4
6
1990
2000
2010
2020
Year


Relative video SumCount
0.0
0.5
1.0
1.5
2.0
2.5
3.
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year
Standardized index
95% confidence interval
Nominal index

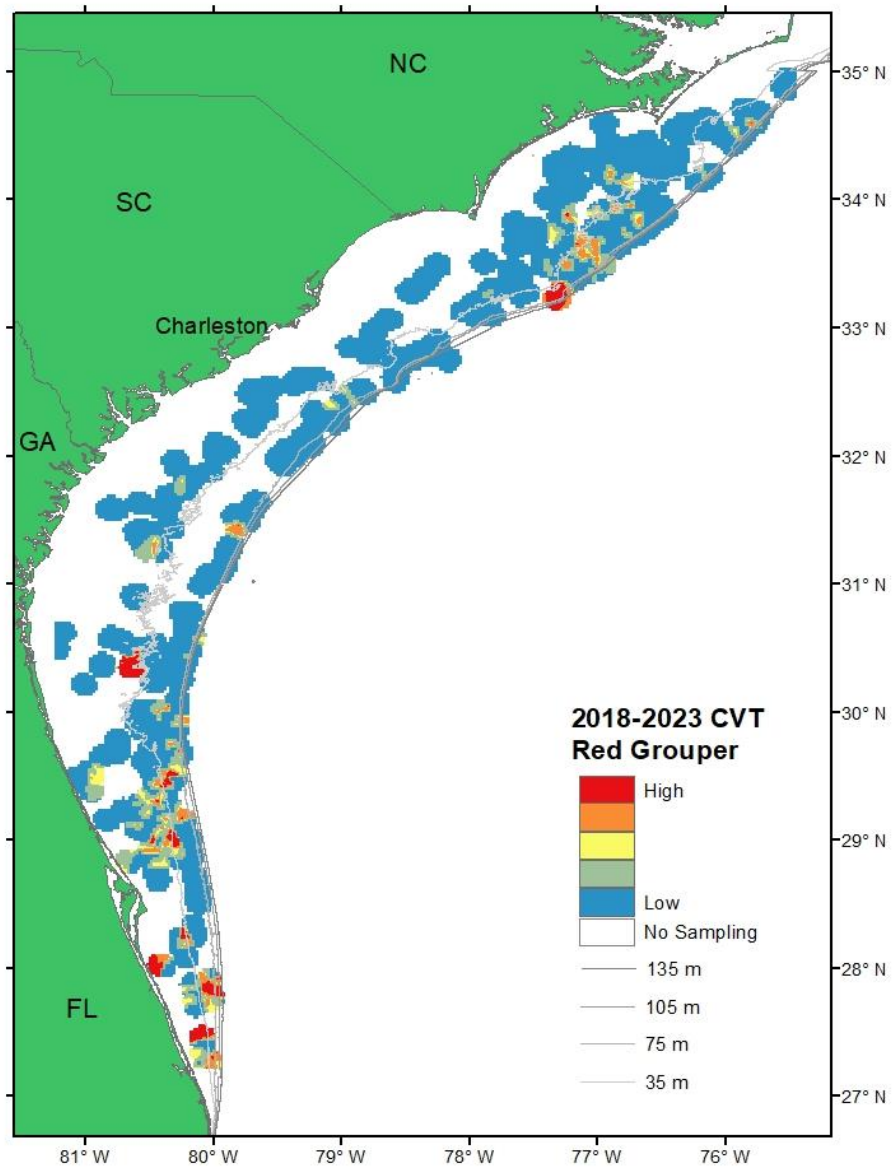


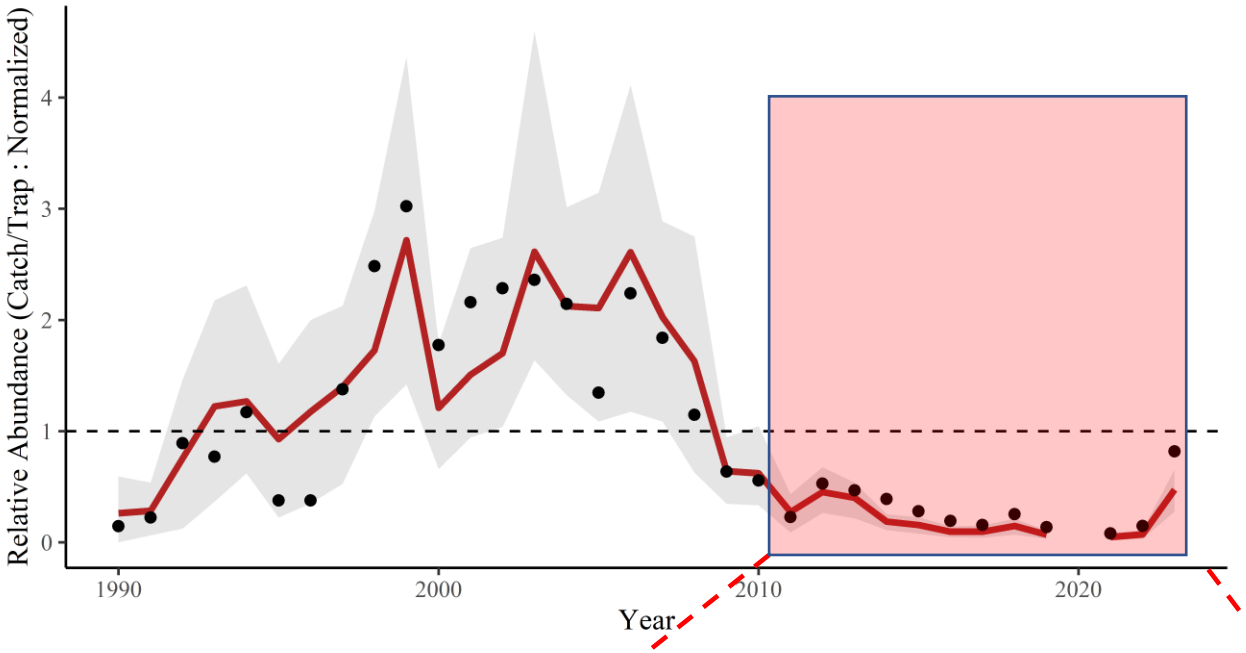
Almaco Jack

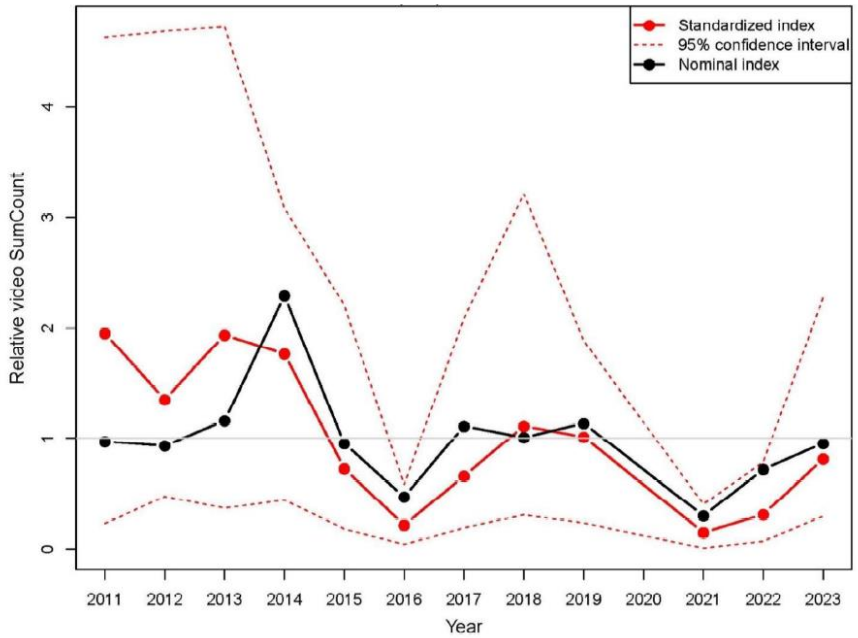


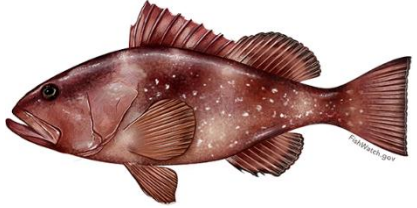


Red Grouper

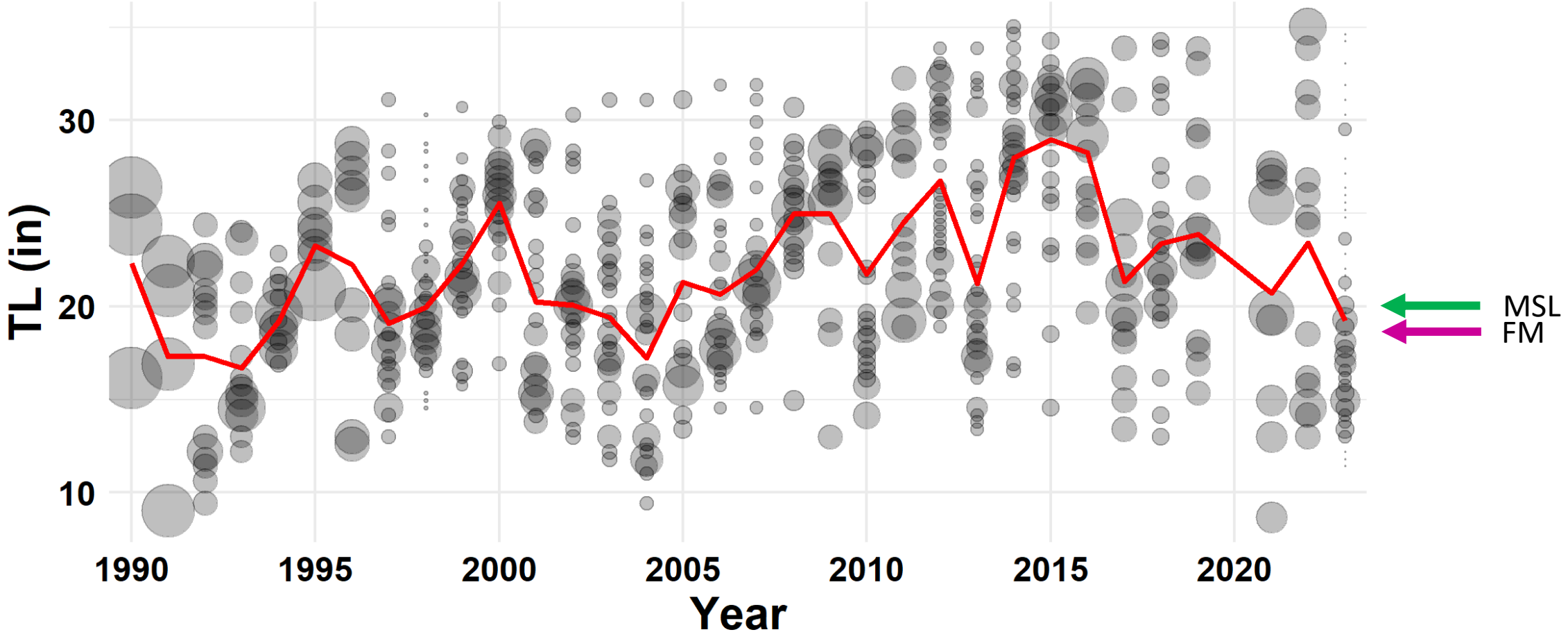

NC
SC
Charleston
GA
FL
2018-2023 CVT
Red Grouper
High
Low
No Sampling
135 m
105 m
75 m
35 m
35° N
34° N
33° N
32° N
31° N
30° N
29° N
28° N
27° N
81° W
80° W
79° W
78° W
77° W
76° W

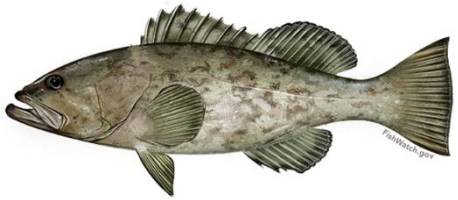

Relative Abundance (Catch/Trap : Normalized)
0
1
2
3
4
1990
2000
2010
2020
Year


Standardized index
95% confidence interval
Nominal index
Relative video SumCount
0
1
2
3
4
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year

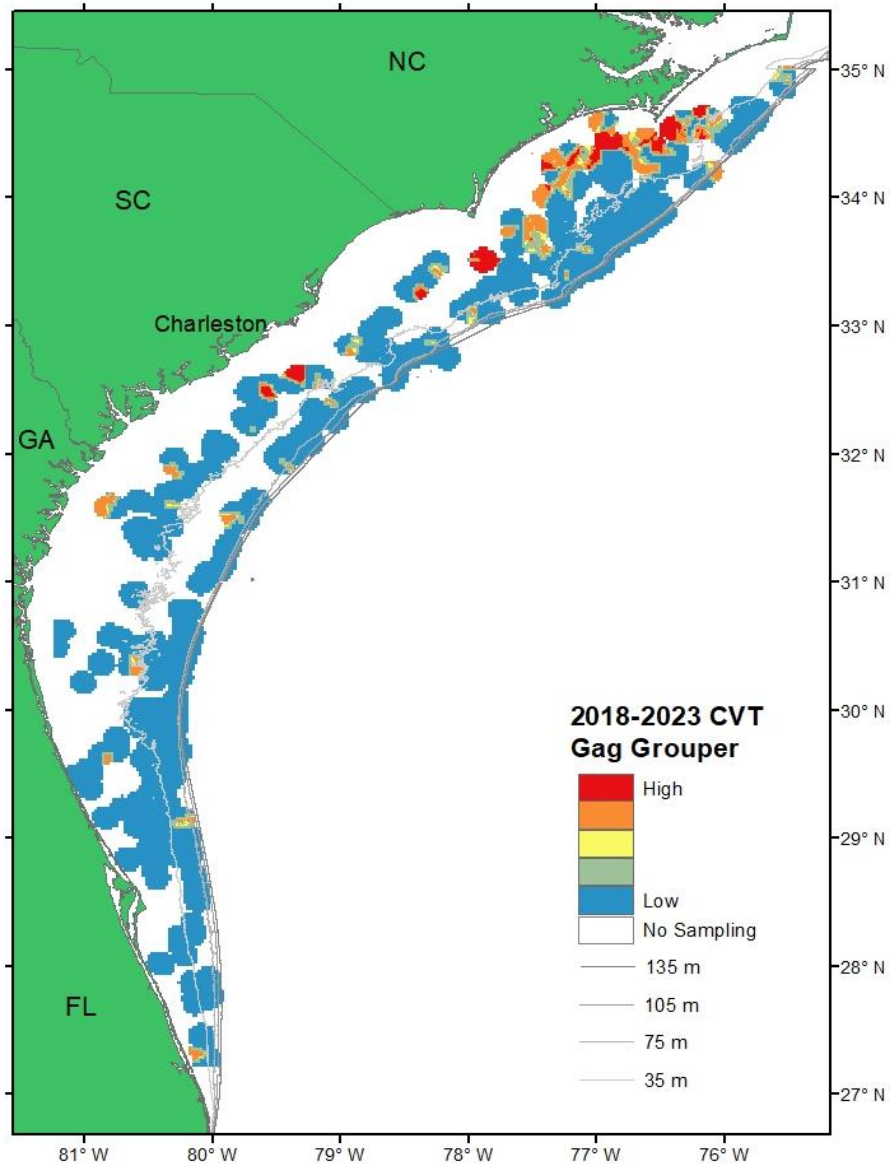


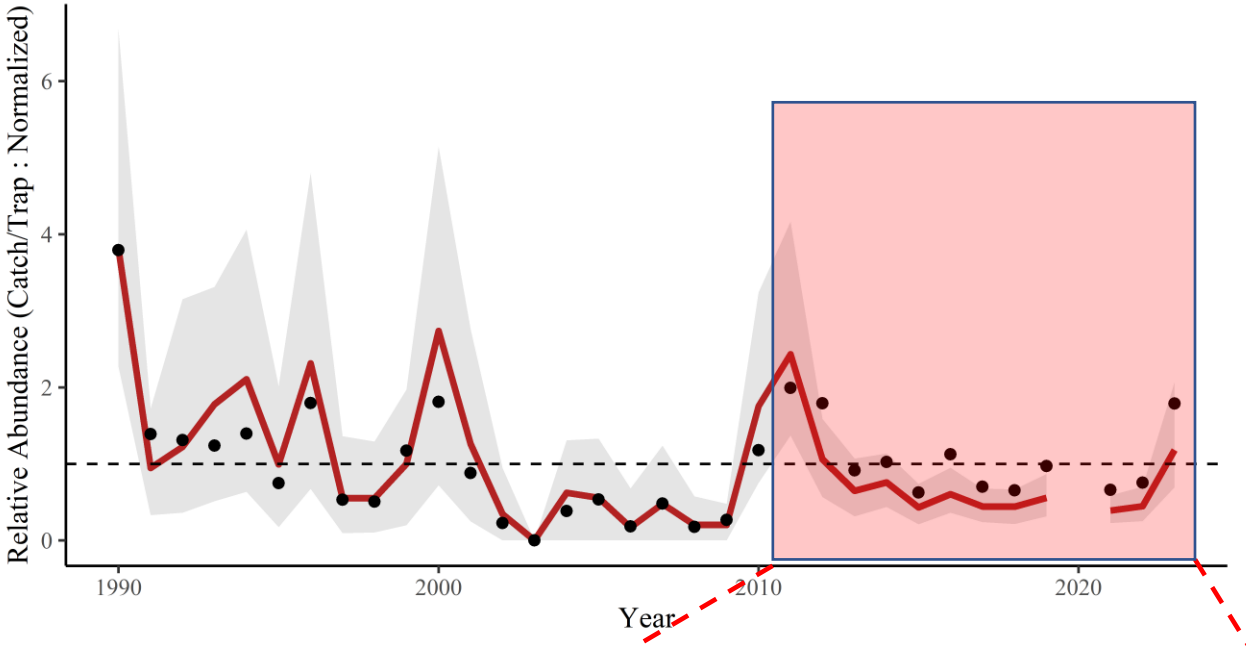
Red Grouper

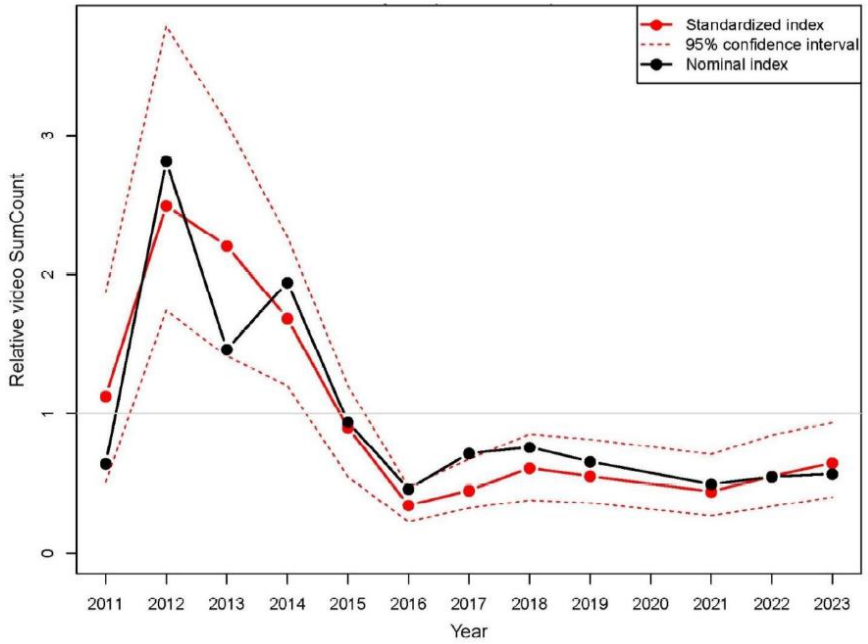


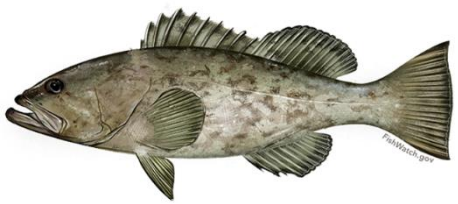


Gag

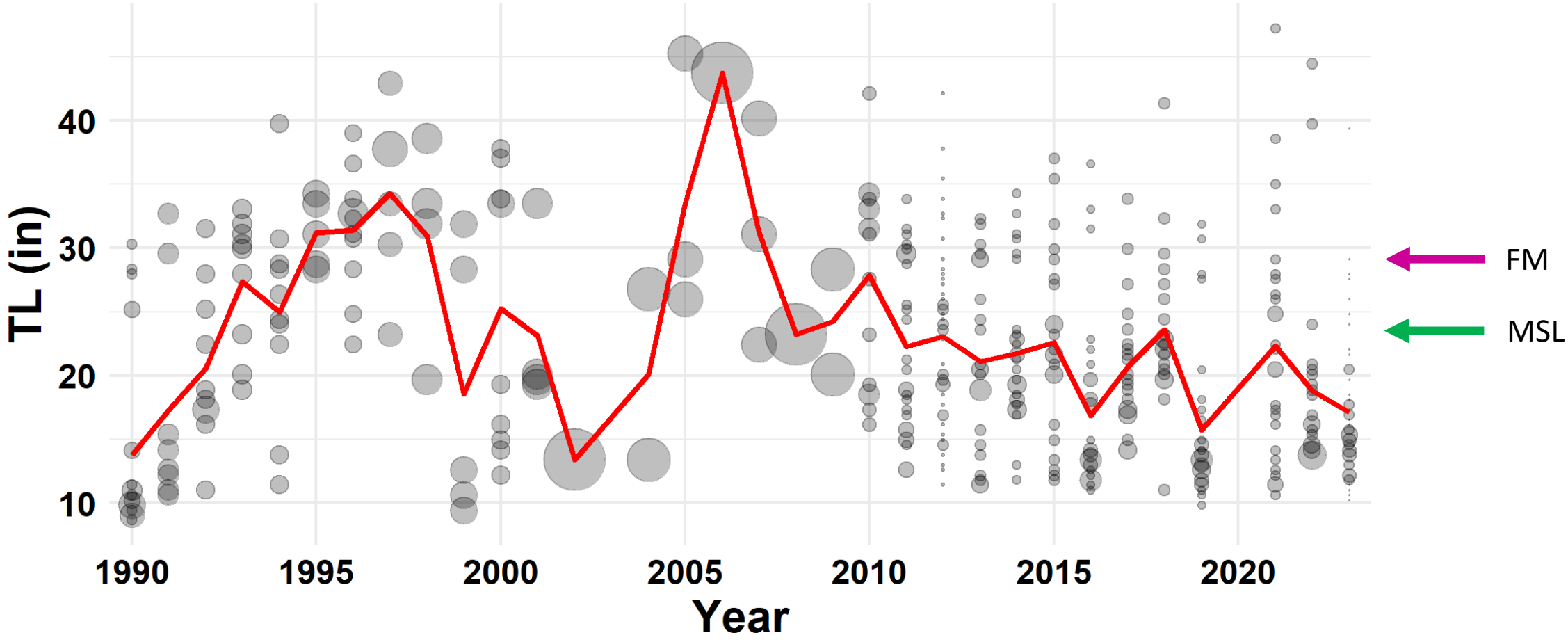

NC
SC
Charleston
GA
FL
2018-2023 CVT
Gag Grouper
High
Low
No Sampling
135 m
105 m
75 m
35 m
35° N
34° N
33° N
32° N
31° N
30° N
29° N
28° N
27° N
81° W
80° W
79° W
78° W
77° W
76° W

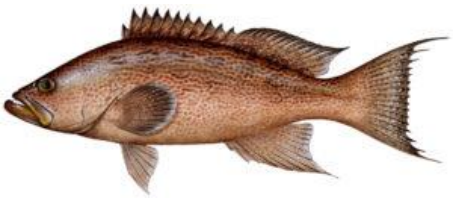

Relative Abundance (Catch/Trap : Normalized)
0
2
4
6
1990
2000
2010
2020
Year


Standardized index
95% confidence interval
Nominal index
Relative viceo SumCount
0
1
2
3
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year

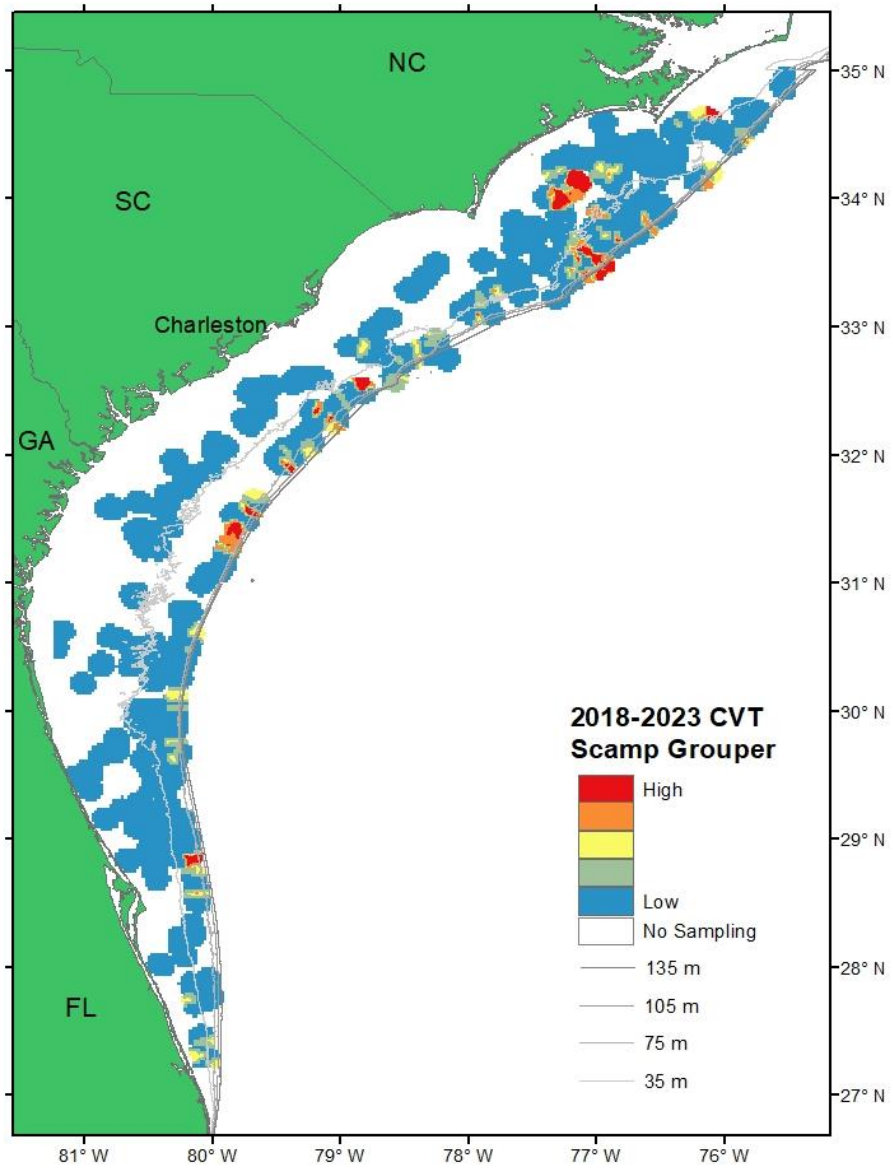


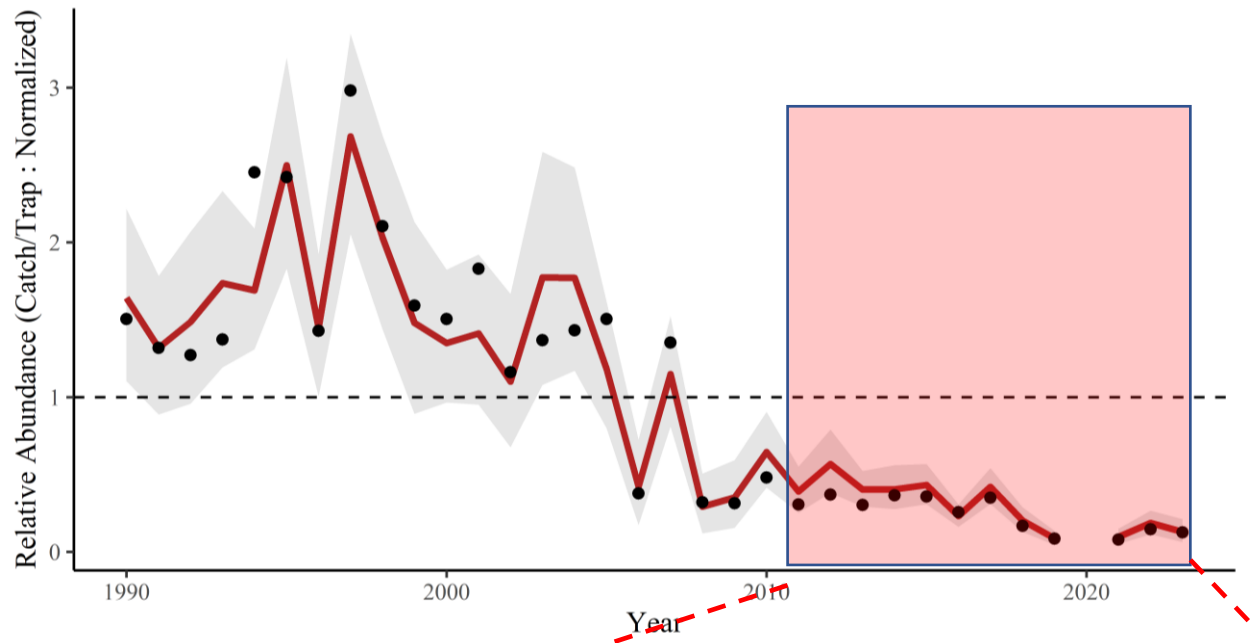
Gag

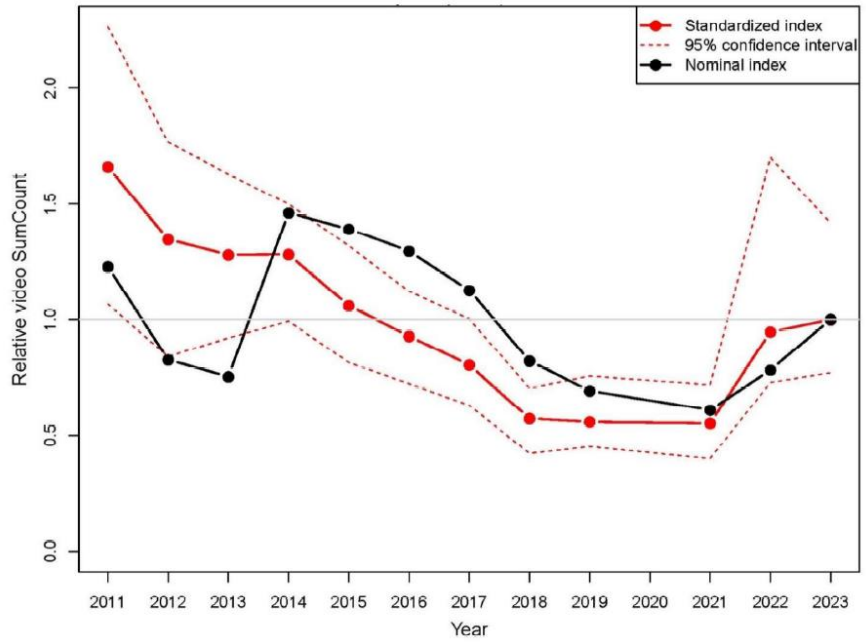


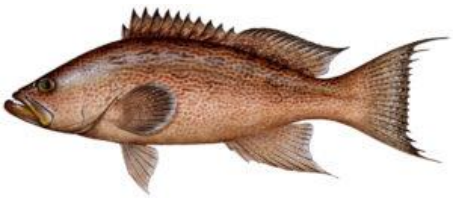


Scamp

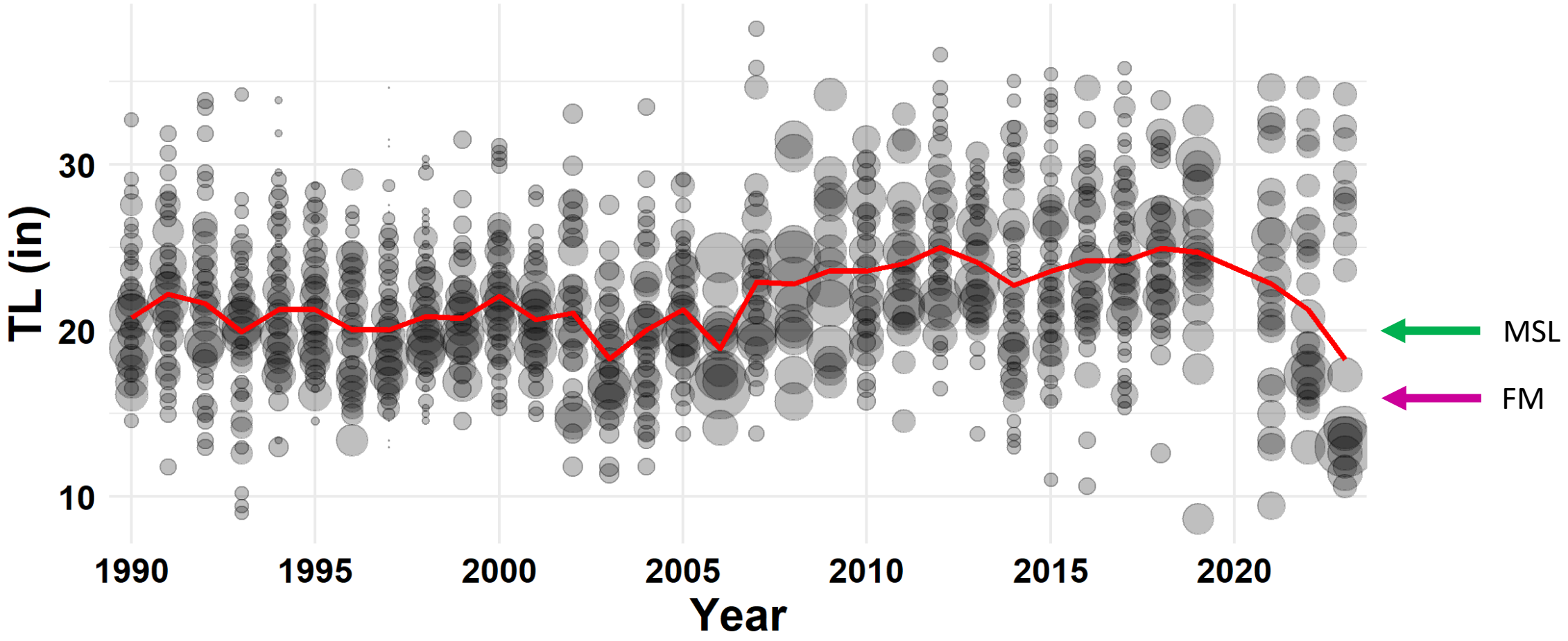

NC
SC
Charleston
GA
FL
35° N
34° N
33° N
32° N
31° N
30° N
29° N
28° N
27° N
81° W
80° W
79° W
78° W
77° W
76° W
2018-2023 CVT
Scamp Grouper
High
Low
No Sampling
135 m
105 m
75 m
35 m


Relative Abundance (Catch/Trap : Normalized)
0
1
2
3
1990
2000
2010
2020
Year


Standardized index
95% confidence interval
Nominal index
Relative video SumCount
0.0
0.5
1.0
1.5
2.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year

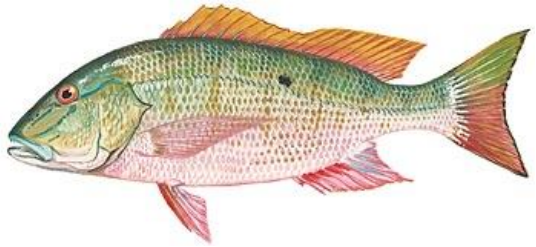


Scamp

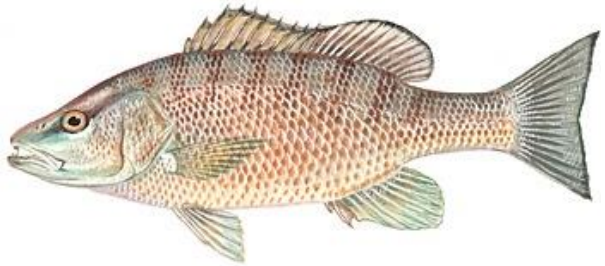


Selected Species
2023 CVT Video Only Indices

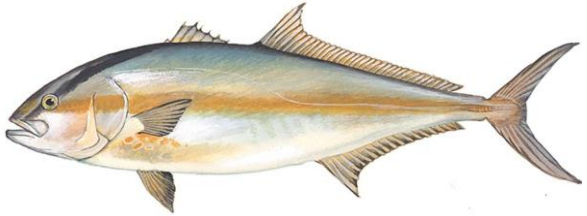
Hogfish



Mutton Snapper

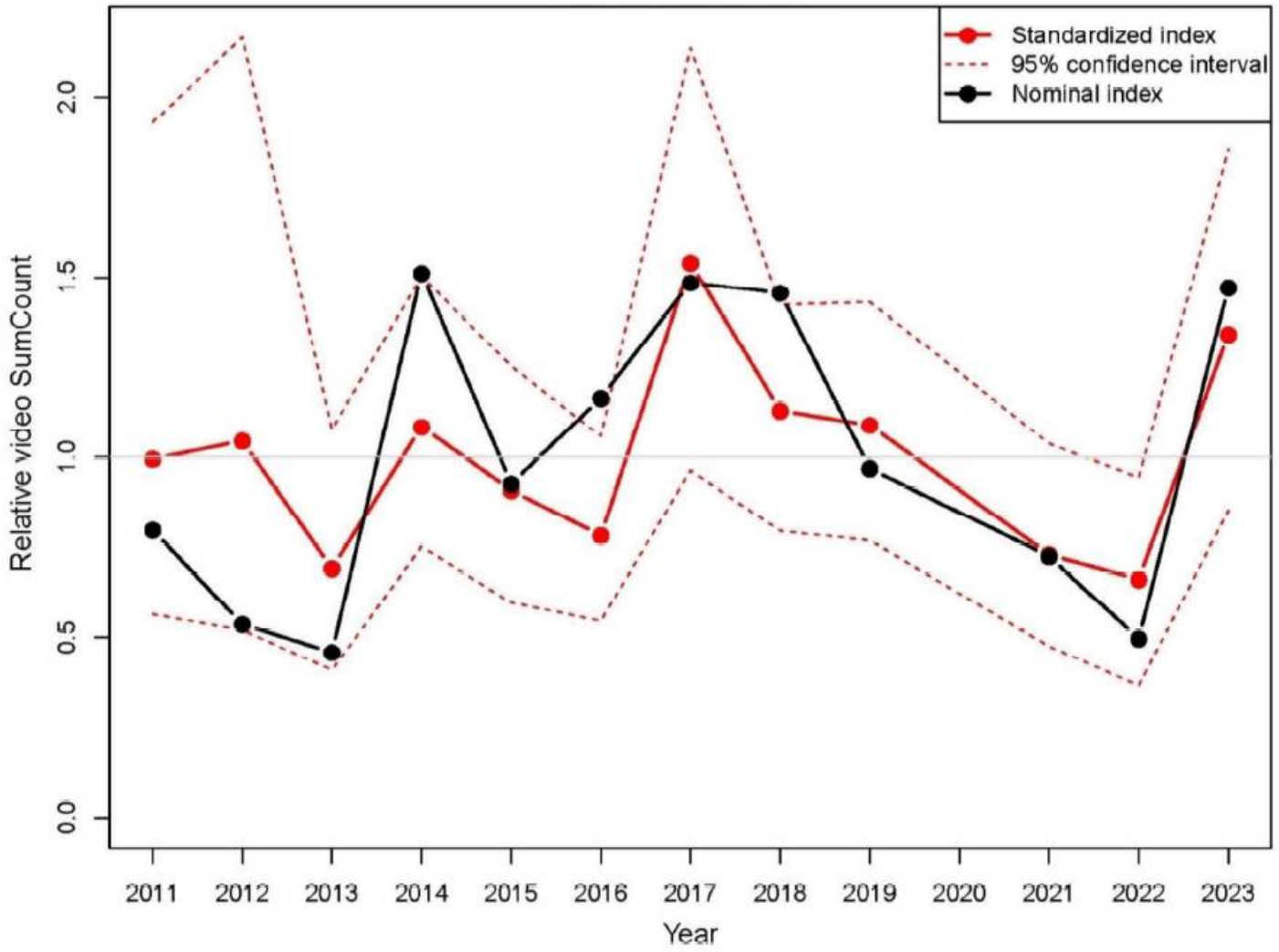


Gray Snapper

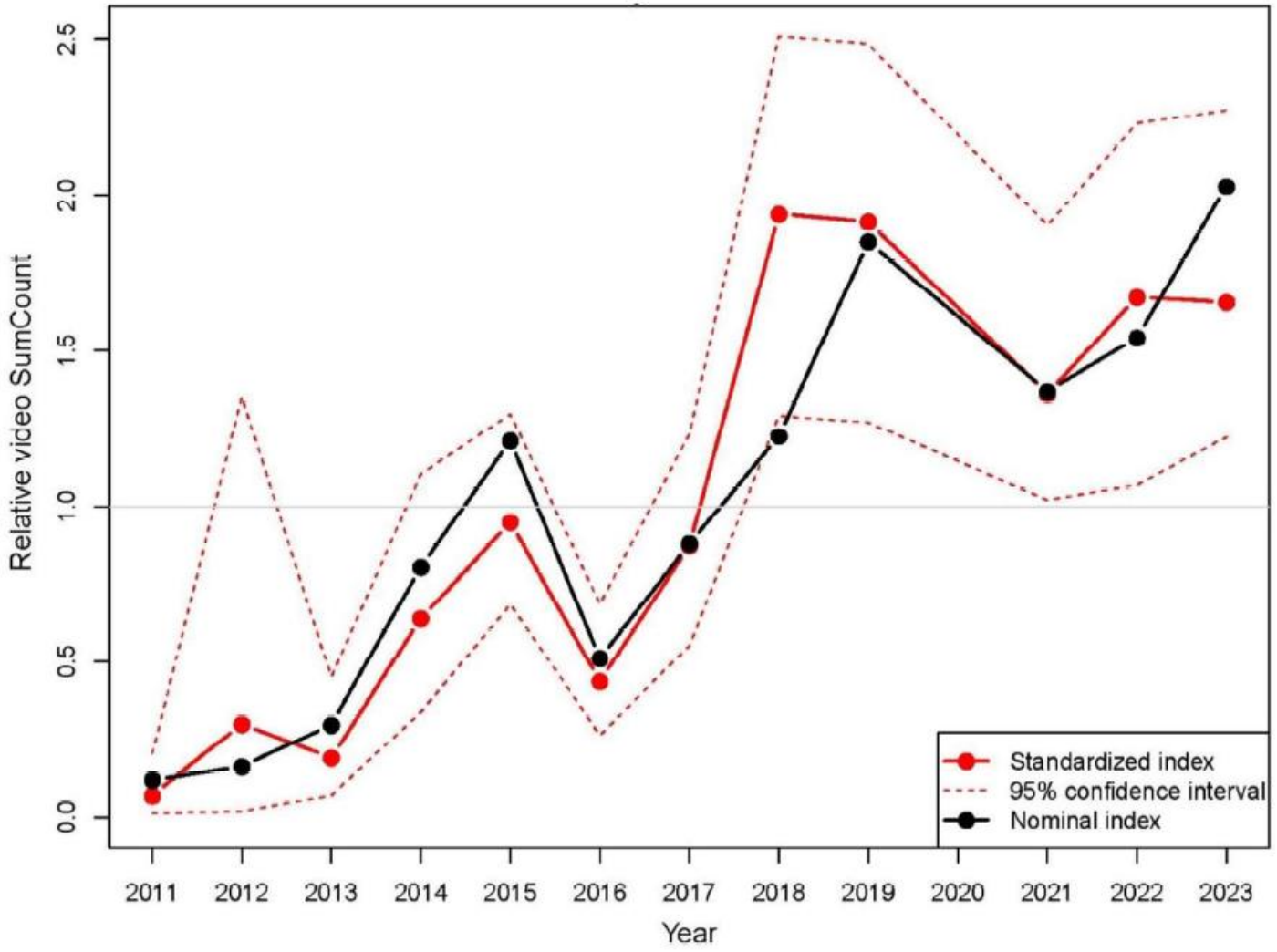


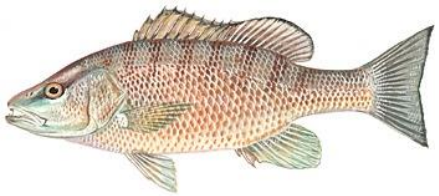
Greater Amberjack

Hogfish

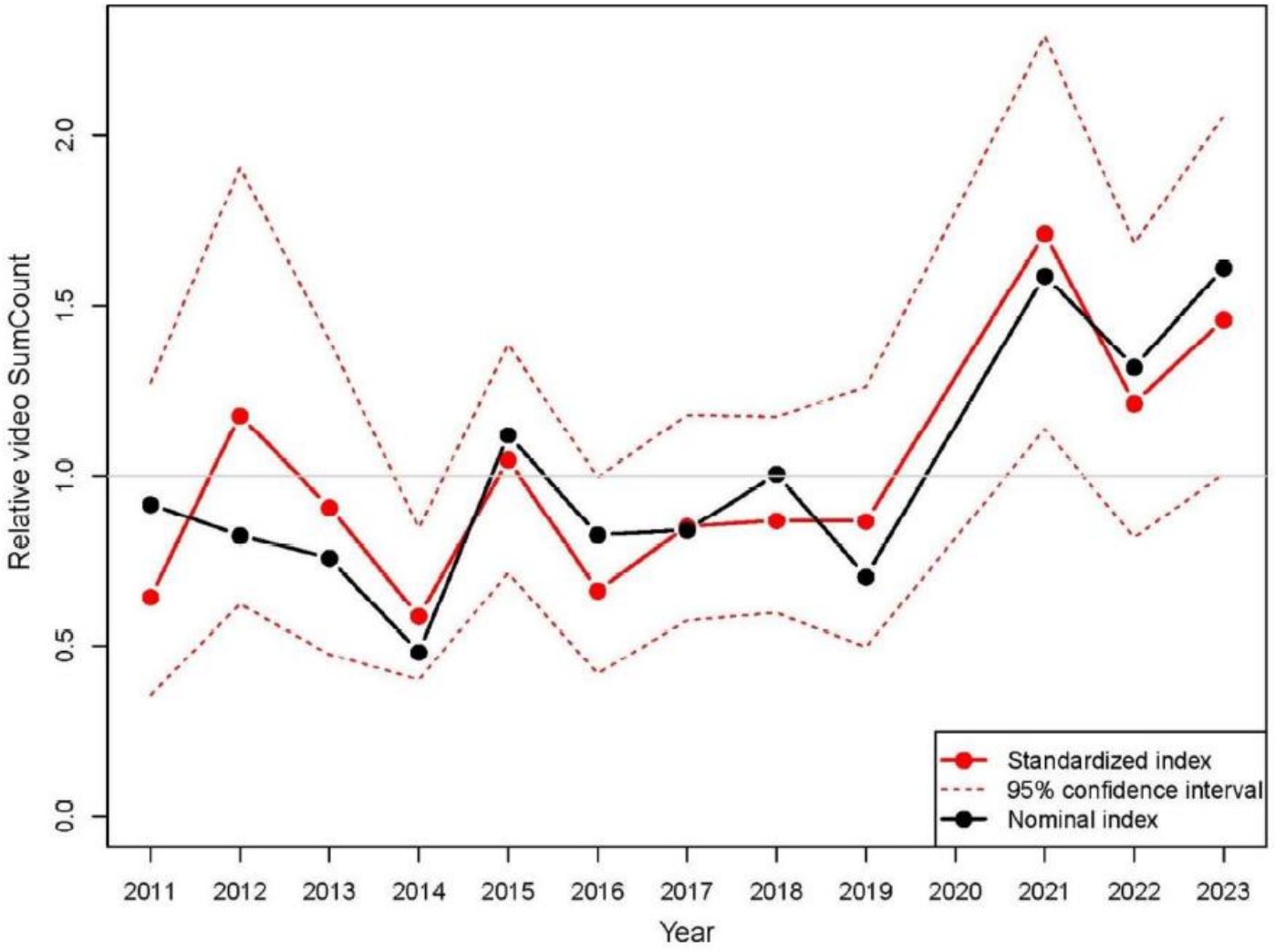

Standardized index
95% confidence interval
Nominal index
Relative video SumCount
0.0
0.5
1.0
1.5
2.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year

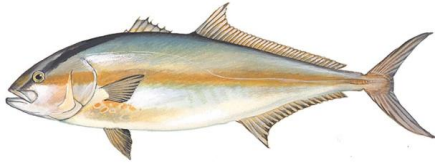
Mutton Snapper



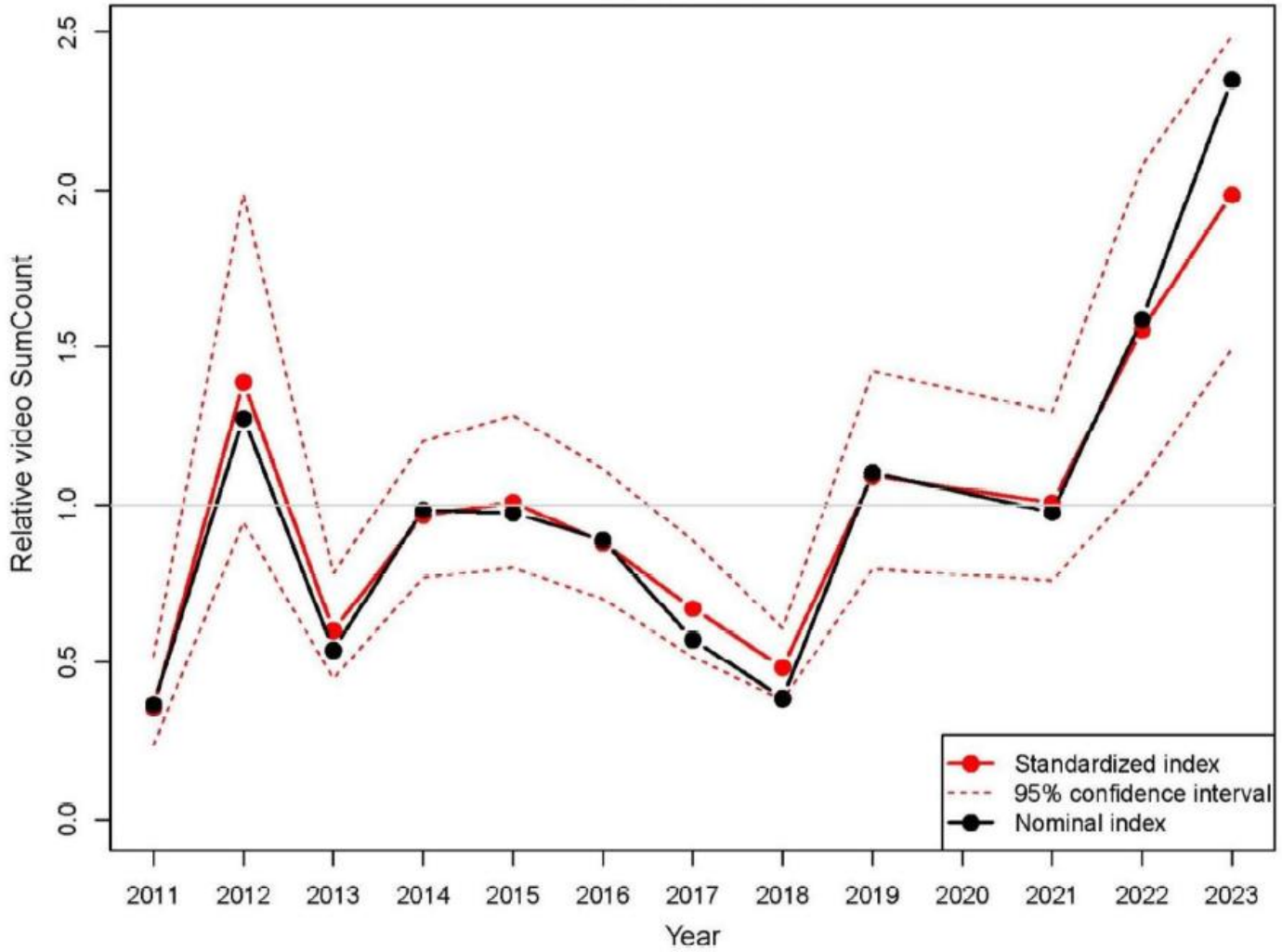


Gray Snapper





Greater Amberjack



2024 SERFS Plans

Sampling Season:

Mid-April –> Mid-October

4 vessels- Chevron Video Trap

Northern Expansion

Wind Energy Lease Baseline Sampling

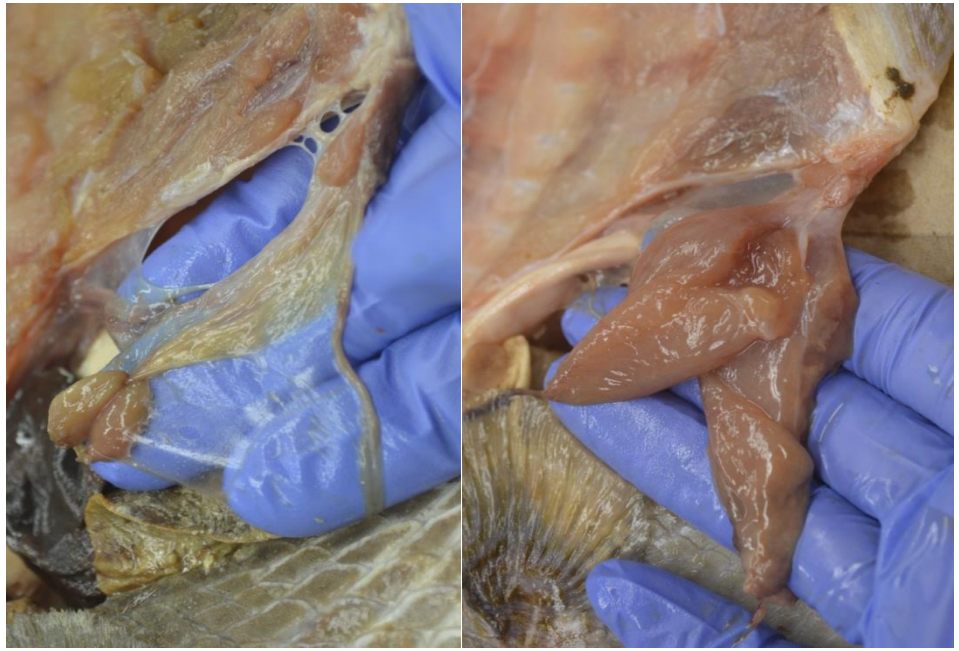
Regional Mapping

2024 SERFS Plans

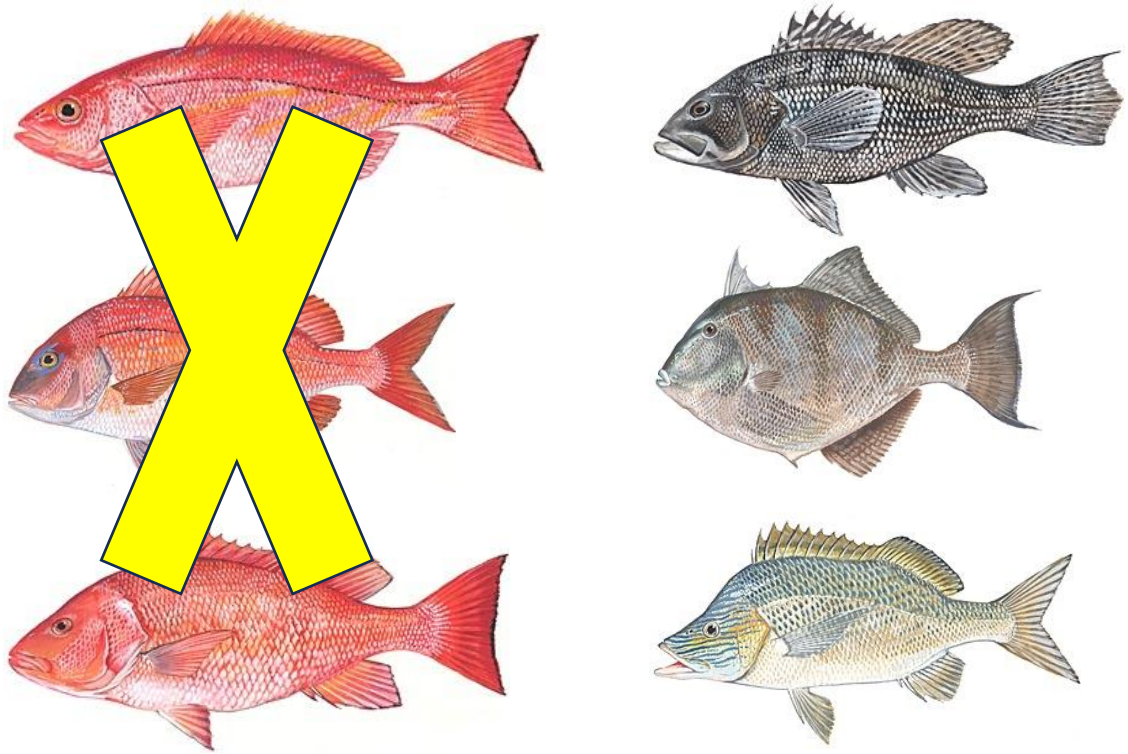
"Balanced" life history sampling

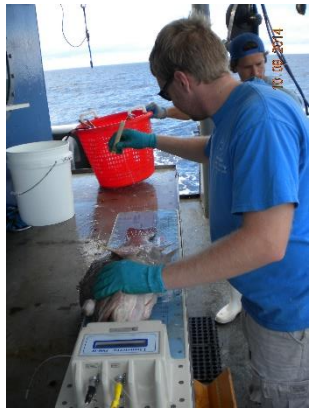
Needs vs fish in hand vs funding

No Male Maturity for
Gray Triggerfish, Red & Vermilion Snapper,
White Grunt



3-Year Maturity Rotation





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Past and Present

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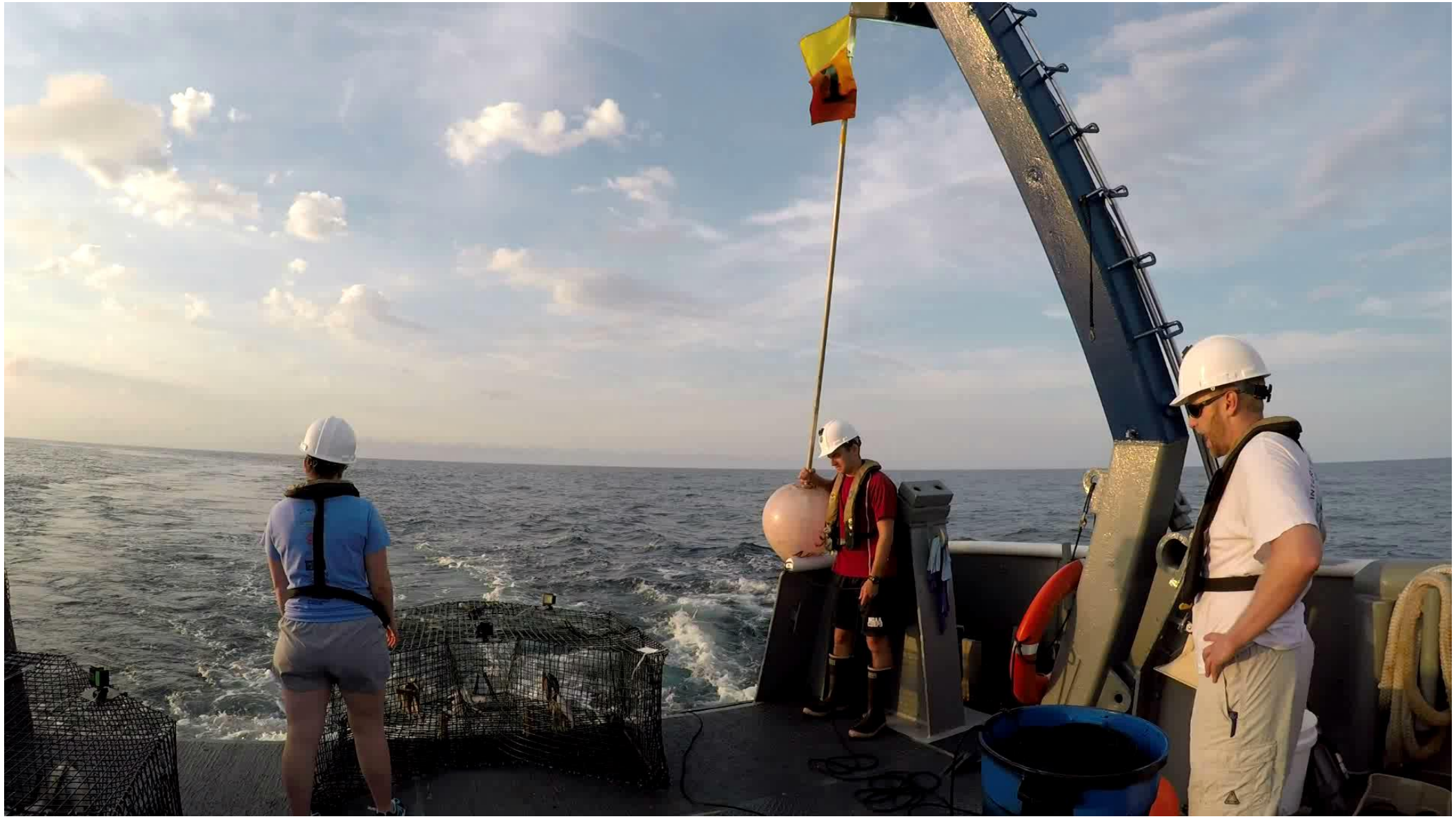

Questions?