# 2018 STOCK ASSESSMENT OF ATLANTIC STRIPED BASS

M Celestino

February 2019

# Assessment Team

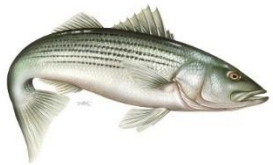
- Michael Celestino, New Jersey Division of Fish and Wildlife, Stock Assessment Subcommittee Chair
- Nicole Lengyel, Rhode Island Division of Marine Fisheries, Technical Committee Chair
- Dr. Stuart Welsh, West Virginia University, Tagging Subcommittee Chair
- Gail Wippelhauser, Maine Department of Marine Resources
- Kevin Sullivan, New Hampshire Department of Fish and Game
- Dr. Gary Nelson, Massachusetts Division of Marine Fisheries
- Justin Davis, Connecticut Department of Energy and Environmental Protection, Marine Fisheries
- Kurt Gottschall, Connecticut Department of Energy and Environmental Protection, Marine Fisheries
- Jessica Best, New York Department of Environmental Conservation, Marine Resources
- Carol Hoffman, New York Department of Environmental Conservation, Marine Resources
- Brendon Harrison, New Jersey Division of Fish and Wildlife
- Michael Kaufmann, Pennsylvania Department of Conservation and Natural Resources
- Ian Park, Delaware Division of Fish and Wildlife
- Dr. Hank Liao, Old Dominion University
- Angela Giuliano, Maryland Department of Natural Resources
- Dr. Alexei Sharov, Maryland Department of Natural Resources
- Beth Versak, Maryland Department of Natural Resources
- Ellen Cosby, Potomac River Fisheries Commission
- Alex Aspinwall, Virginia Marine Resources Commission
- Chris Bonzek, Virginia Institute of Marine Science
- Charlton Godwin, North Carolina Department of Natural Resources
- Jeremy McCargo, North Carolina Department of Natural Resources
- Gary Shepherd, National Marine Fisheries Service, Northeast Fisheries Science Center
- Dr. John Sweka, U.S. Fish and Wildlife Service
- Steve Minkkinen, U.S. Fish and Wildlife Service
- Dr. Wilson Laney, U.S. Fish and Wildlife Service
- Josh Newhard, U.S. Fish and Wildlife Service
- Dr. Katie Drew, ASMFC Senior Stock Assessment Scientist
- Max Appelman, ASMFC Fishery Management Plan Coordinator

# Data Changes for Benchmark

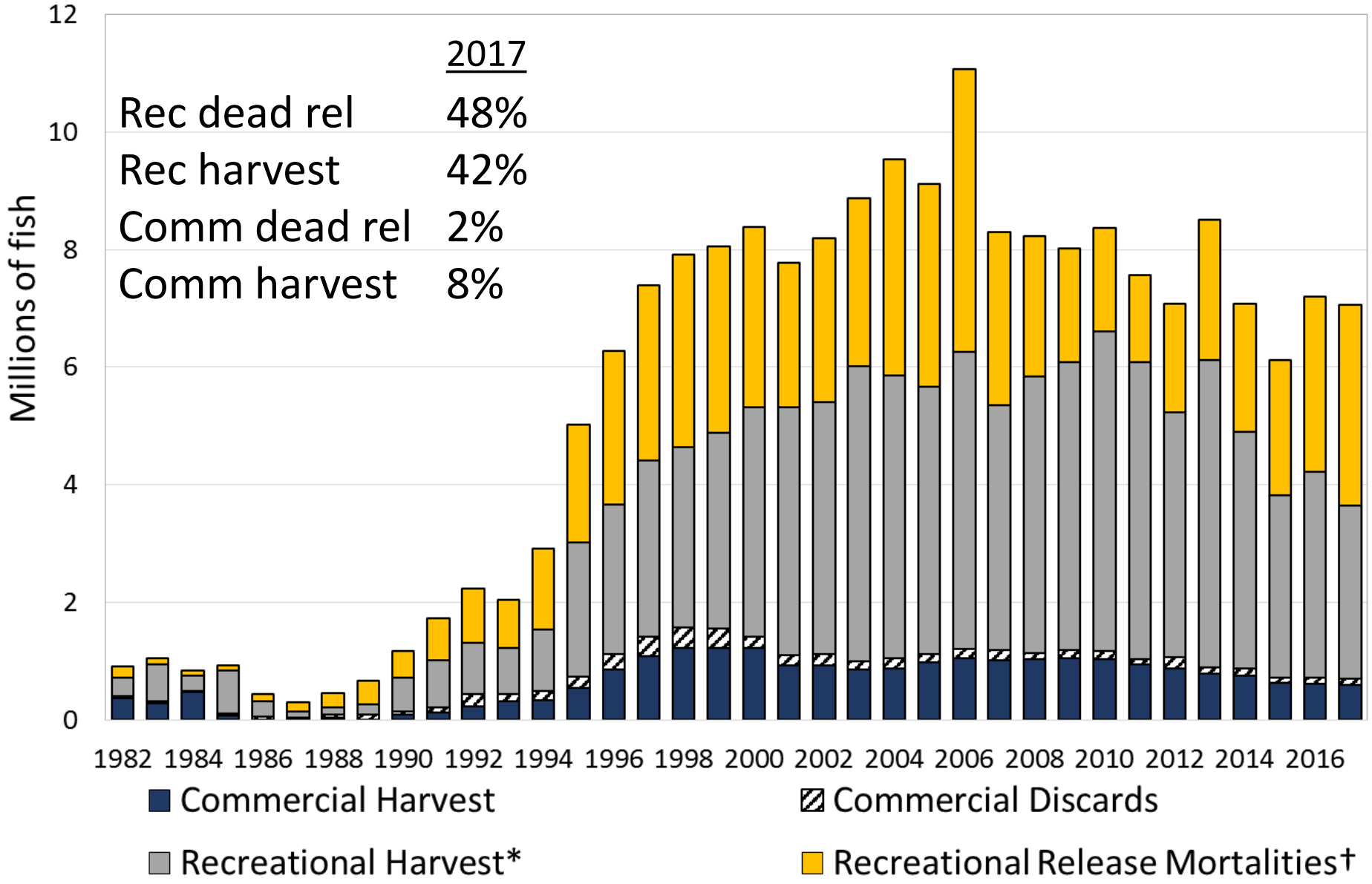
- Calibrated recreational MRIP data
- Plus group extended from age 13+ to 15+
- Fleets reduced from 3 to 2
- Commercial dead discards: from raw tags to smoothed and adjusted tags (& MRIP releases)
- Index changes:

| | |
|---|---|
| Composite YOY (MD & VA) | ChesMMAP Trawl (new) |
| MRIP (age composition) | NEFSC Trawl (eliminated) |
| CT Trawl (age composition) | VA Pound Net (eliminated) |
| DE 30' Trawl (new) | |

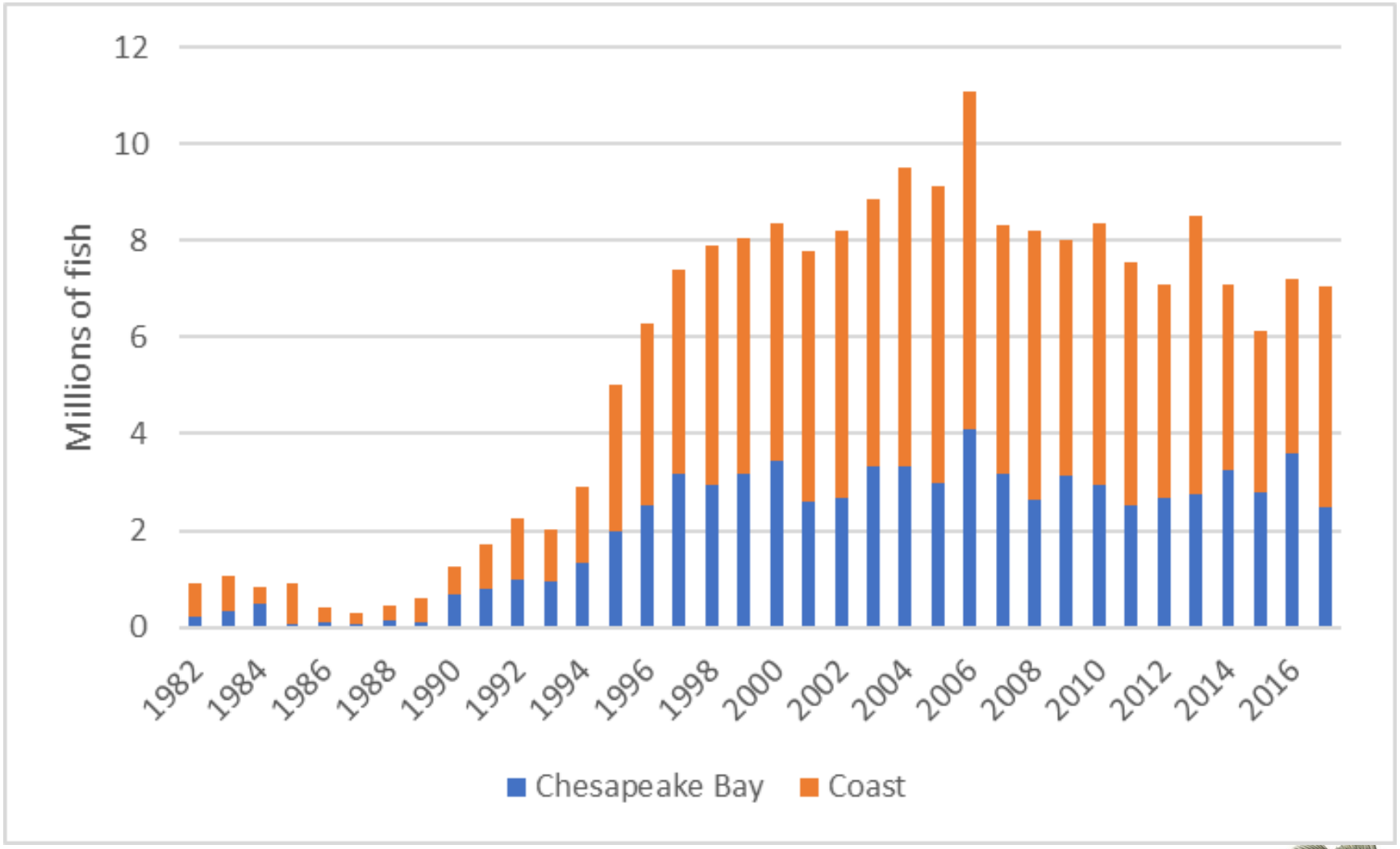
- Updated female maturity ogive
- Scale and otolith ages used
- Terminal year = 2017



# Coastwide Total Removals

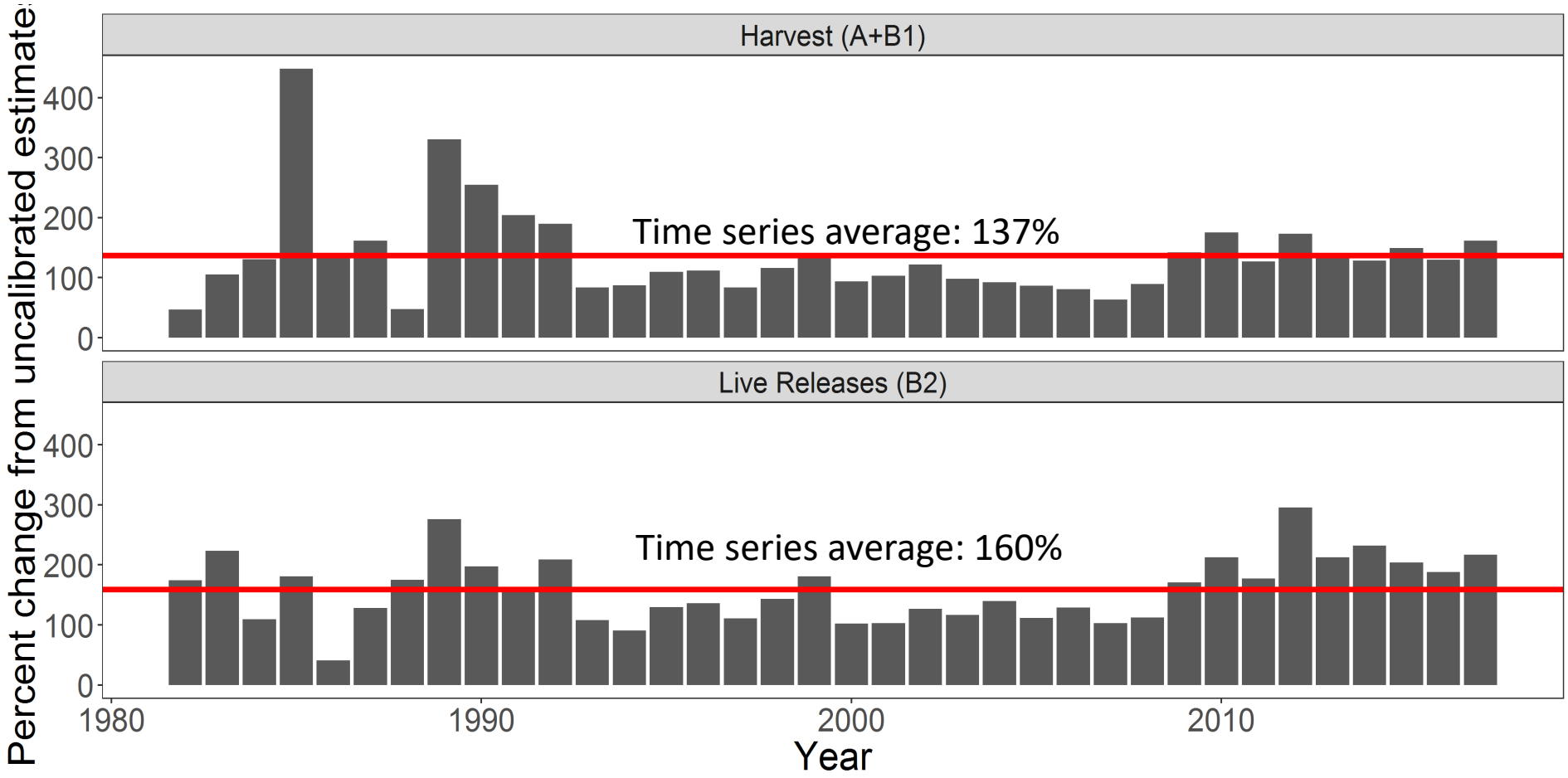


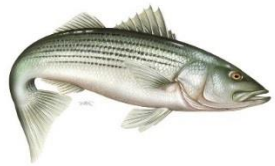
# Total Removals By 'Fleet'



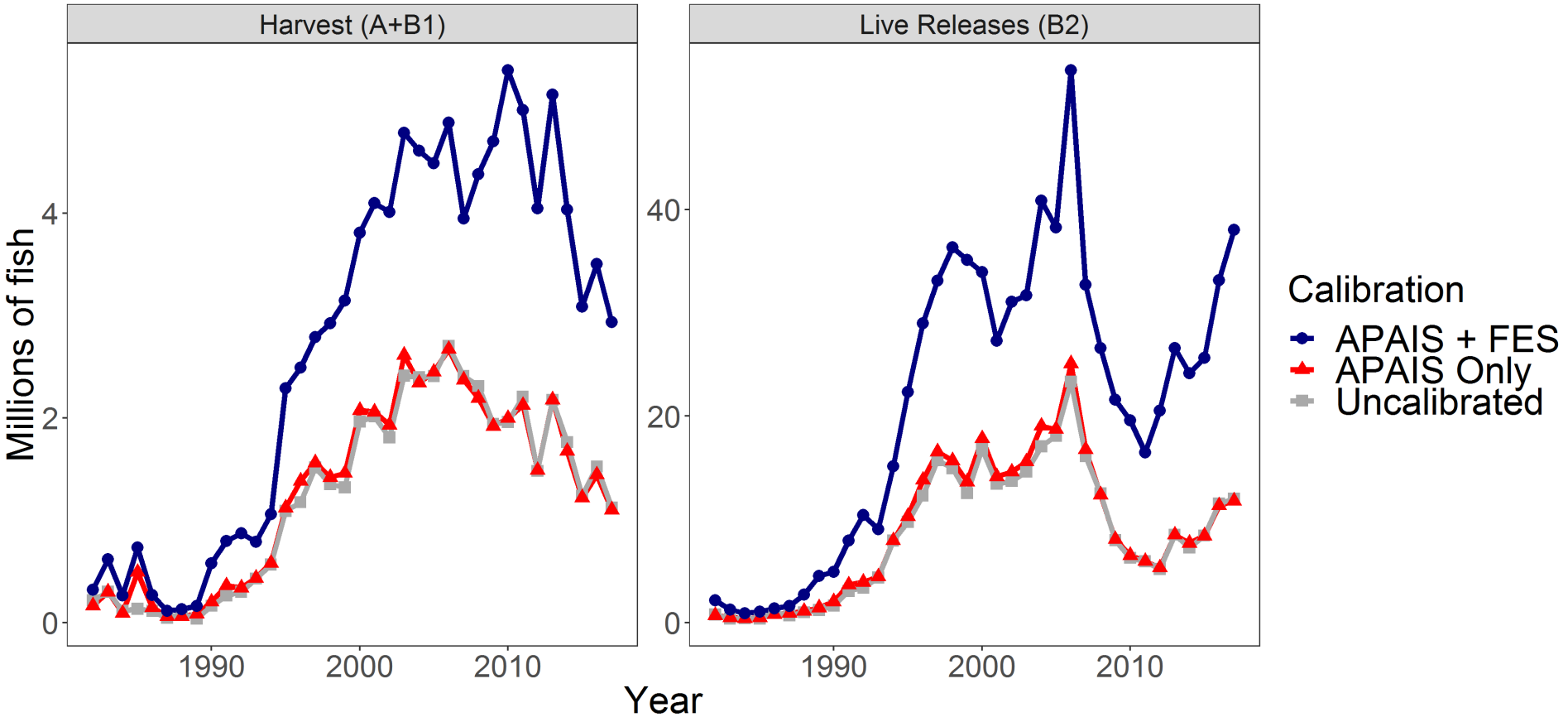

# State trends in Recreational Harvest and Release Numbers

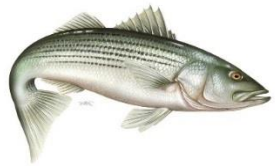
# MRIP Calibration Comparisons



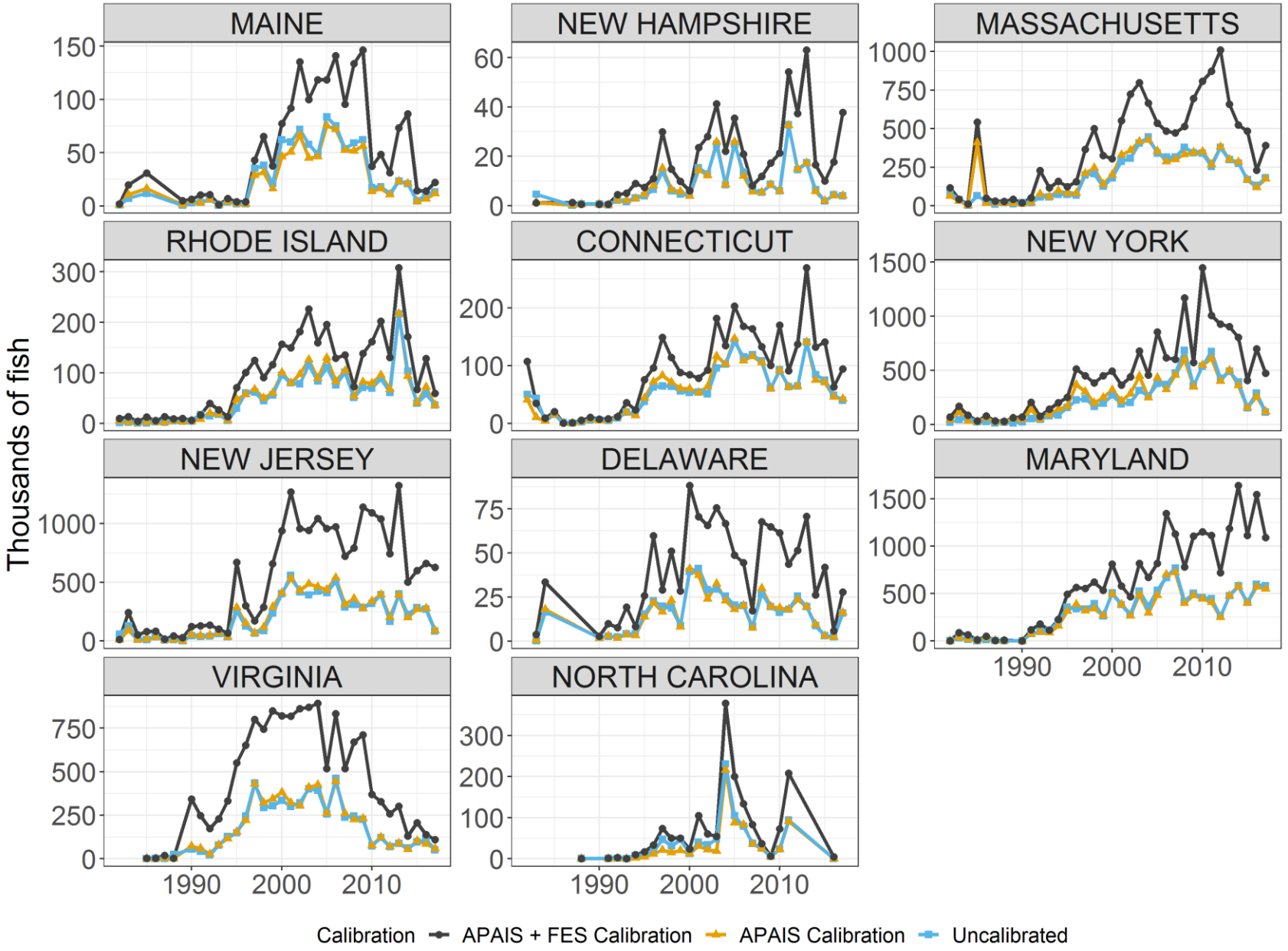



# Catch Comparisons

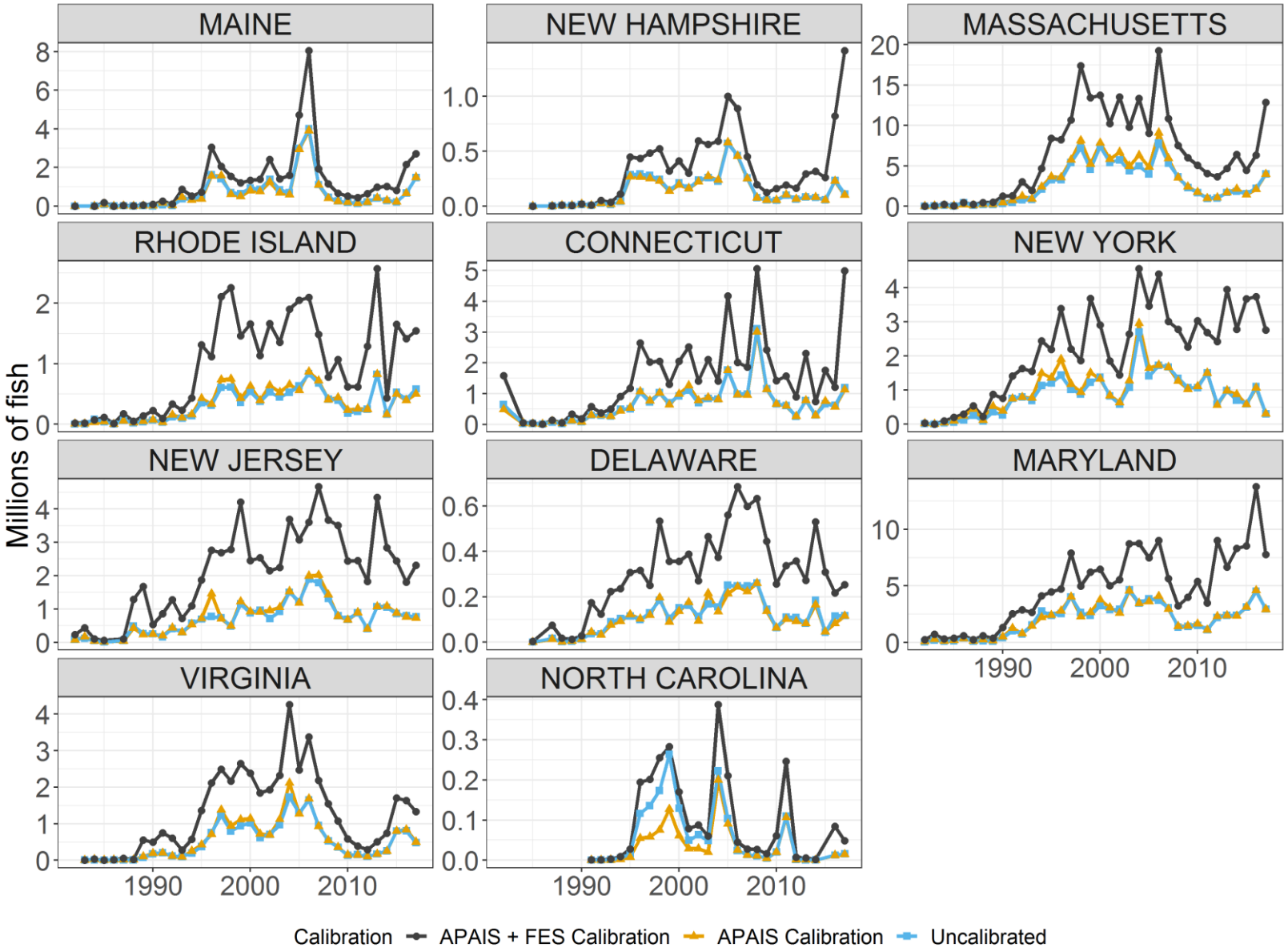


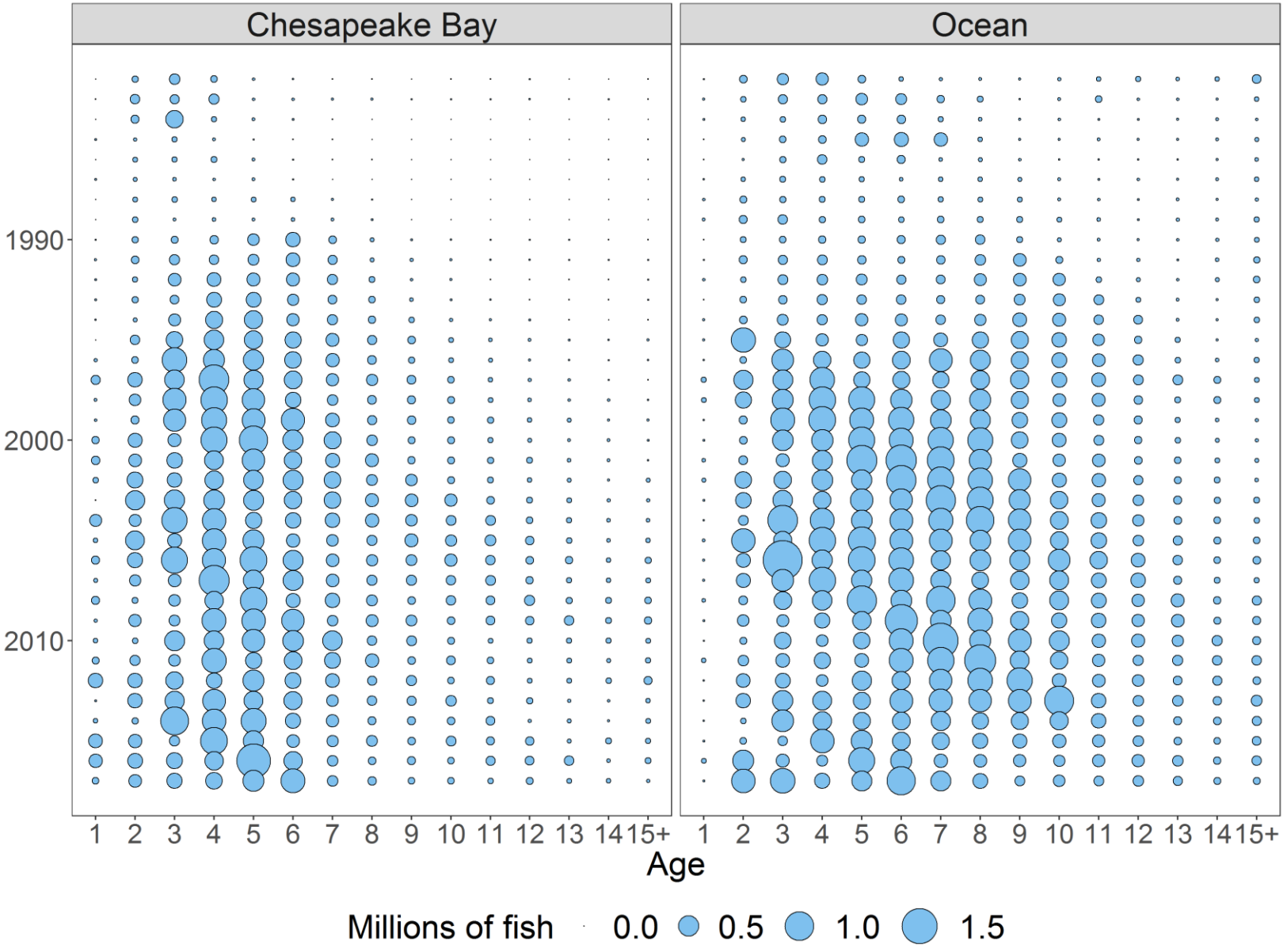
# Recreational harvest by state



# Recreational live releases by state



# Catch composition



# YOY, Age-1, Age Aggregate, and Age Composition Surveys

# Overview

- Index changes:

Composite YOY (MD & VA)

MRIP (age composition)

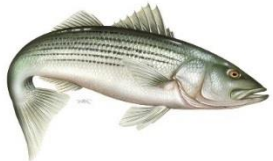
CT Trawl (age composition)

DE 30' Trawl (new)

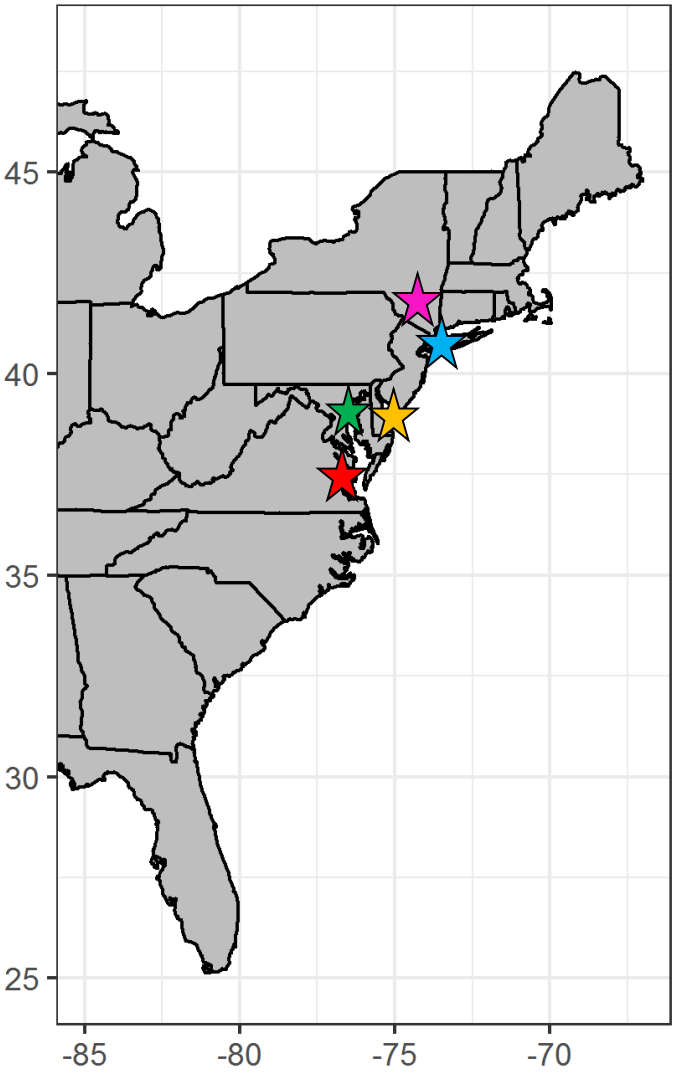
ChesMMAP Trawl (new)

NEFSC Trawl (eliminated)

VA Pound Net (eliminated)



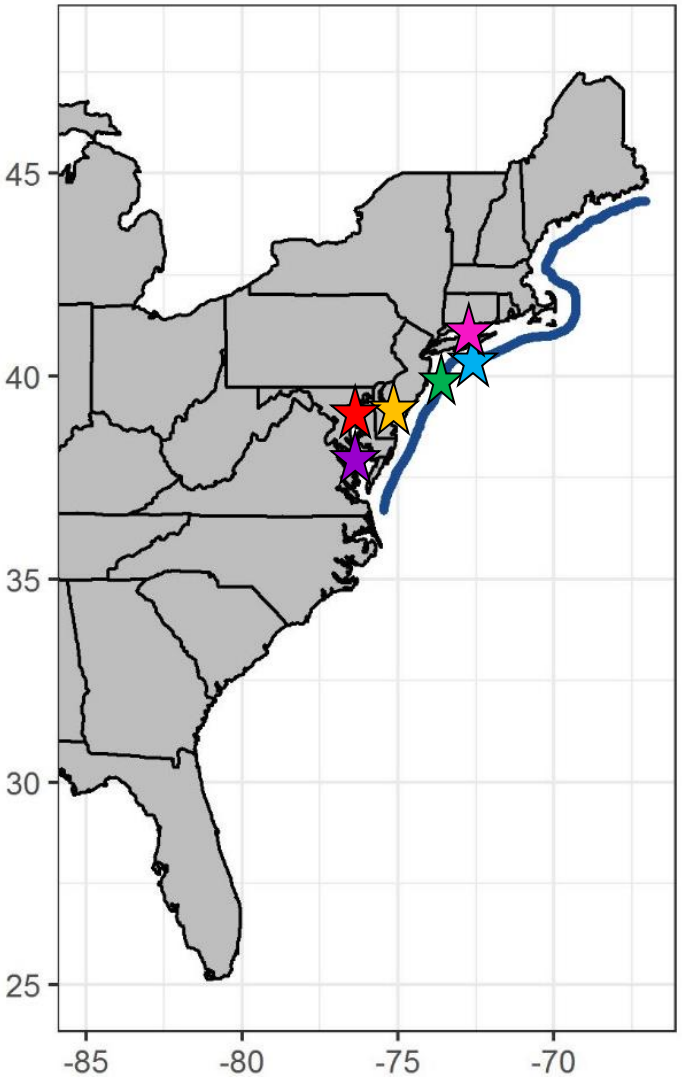
# Indices




## Recruitment Indices

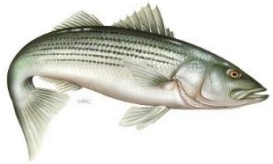
- NY Hudson River YOY Index
- NY W. Long Island Age 1 Index
- NJ DE River YOY Index
- MD YOY and Age-1 indices
- VA YOY Index

# Indices

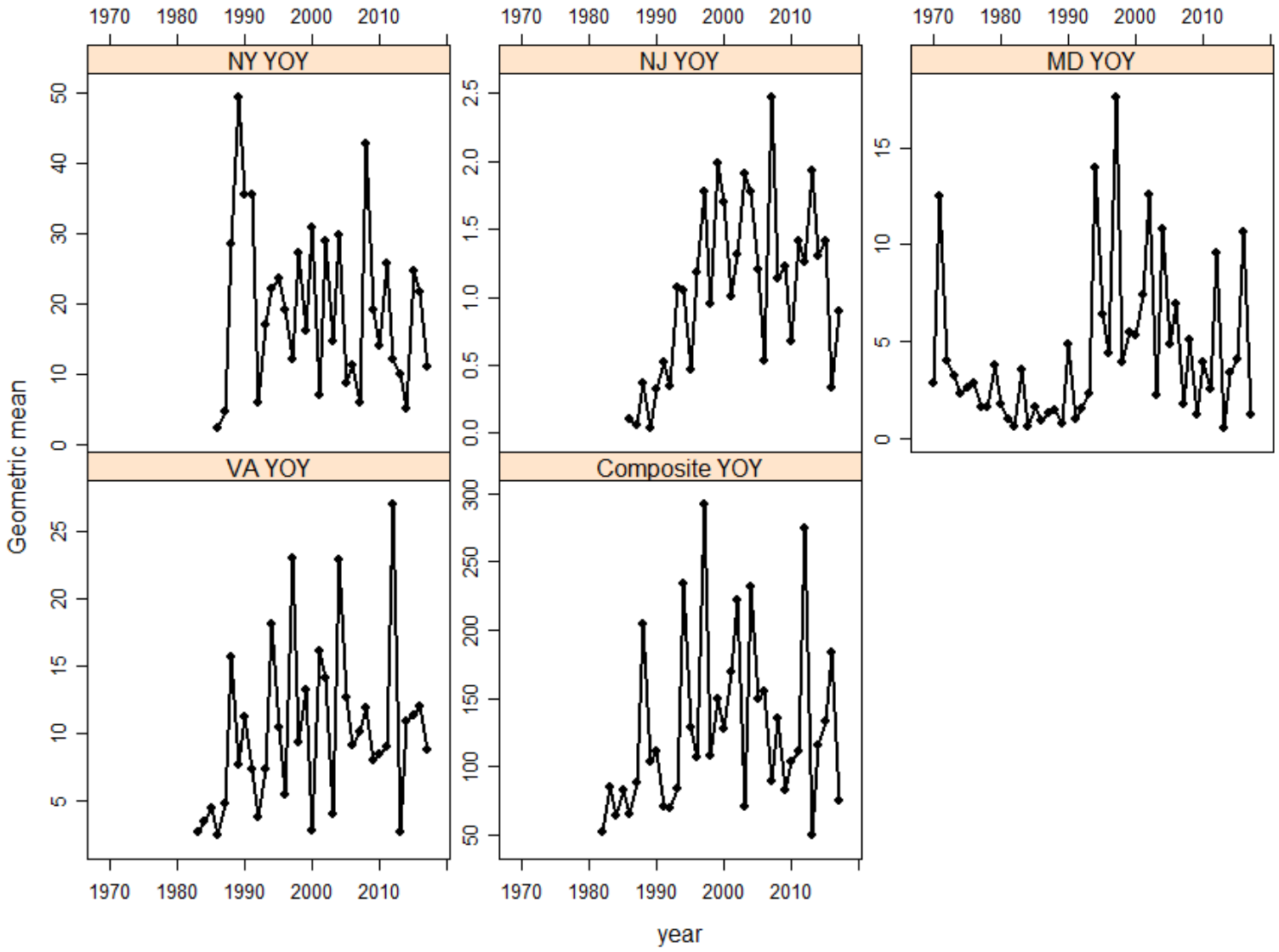



Age 1+ Indices

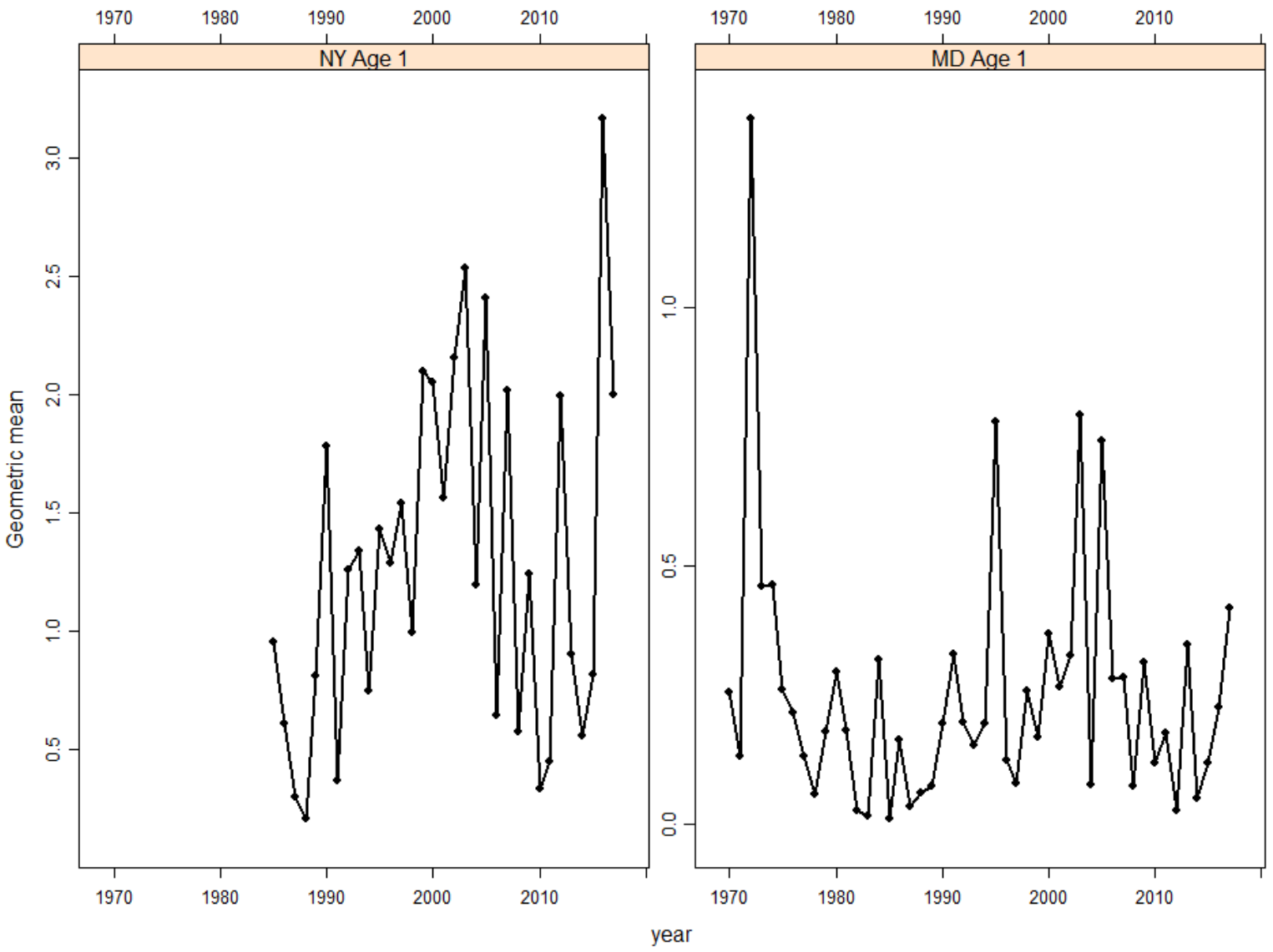
- MRIP CPUE (VA – ME)
- CT Long Island Sound Trawl Survey
- NY Ocean Haul Seine
- NJ Ocean Trawl
- DE Bay Trawl, DE Bay Electrofishing Survey
- MD Gillnet Survey
- ChesMMAP



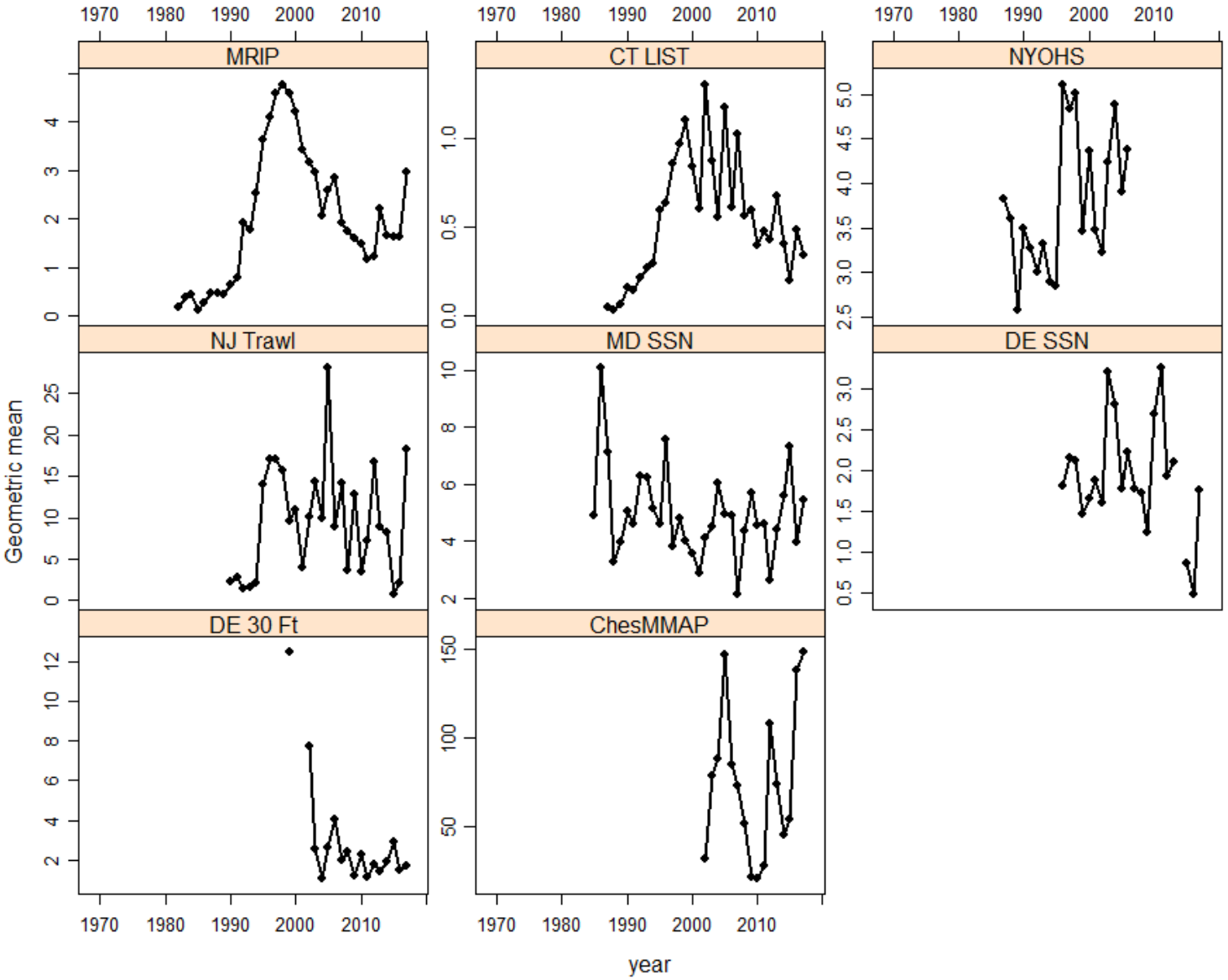
# YOY


NY YOY
NJ YOY
MD YOY
VA YOY
Composite YOY
Geometric mean
year
1970
1980
1990
2000
2010

# Age 1


NY Age 1
MD Age 1
Geometric mean
year
1970
1980
1990
2000
2010
0.0
0.5
1.0
1.5
2.0
2.5
3.0

# Age Composition surveys



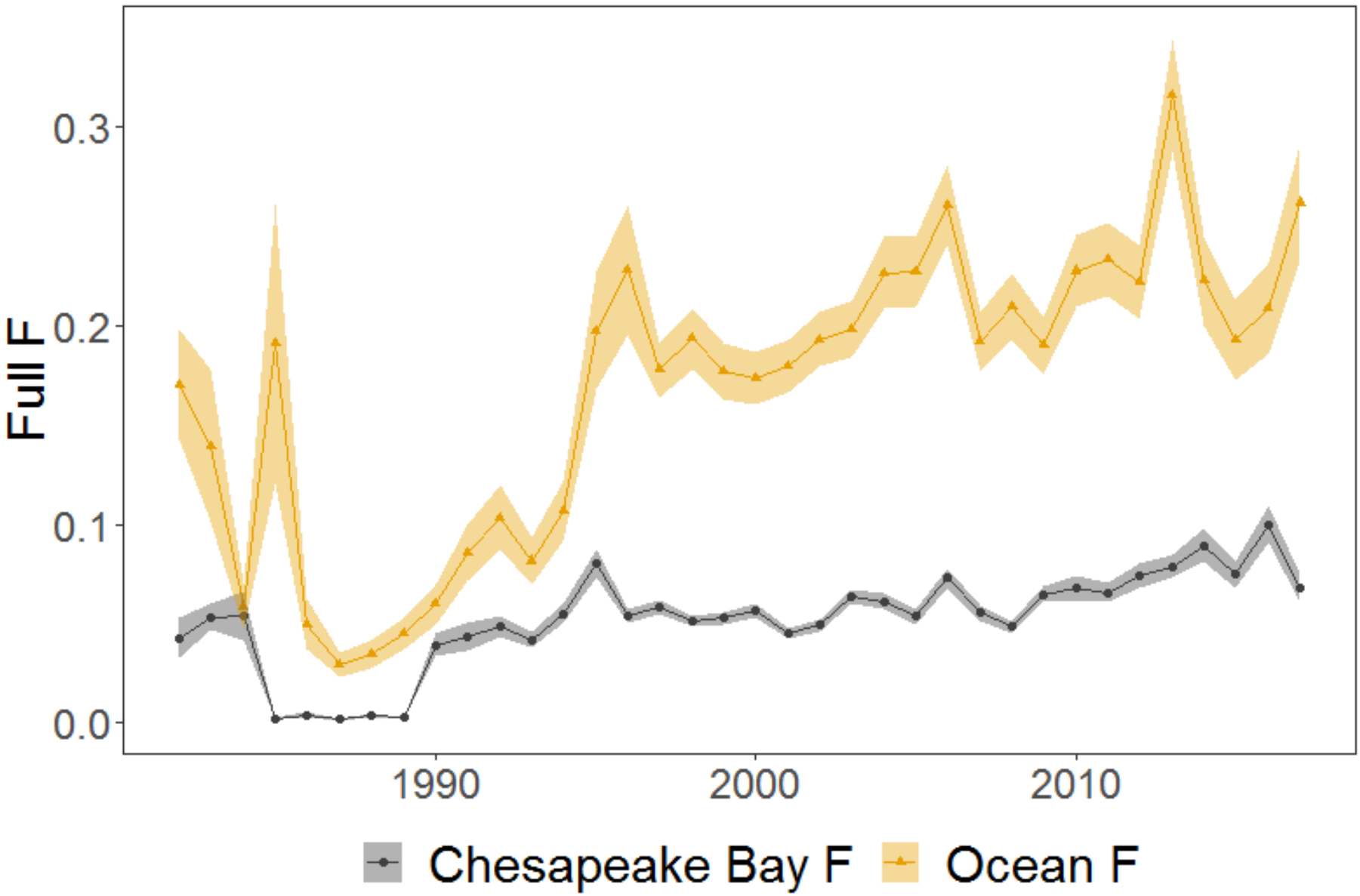

# Statistical Catch At Age Modeling

# Statistical Catch-At-Age Model

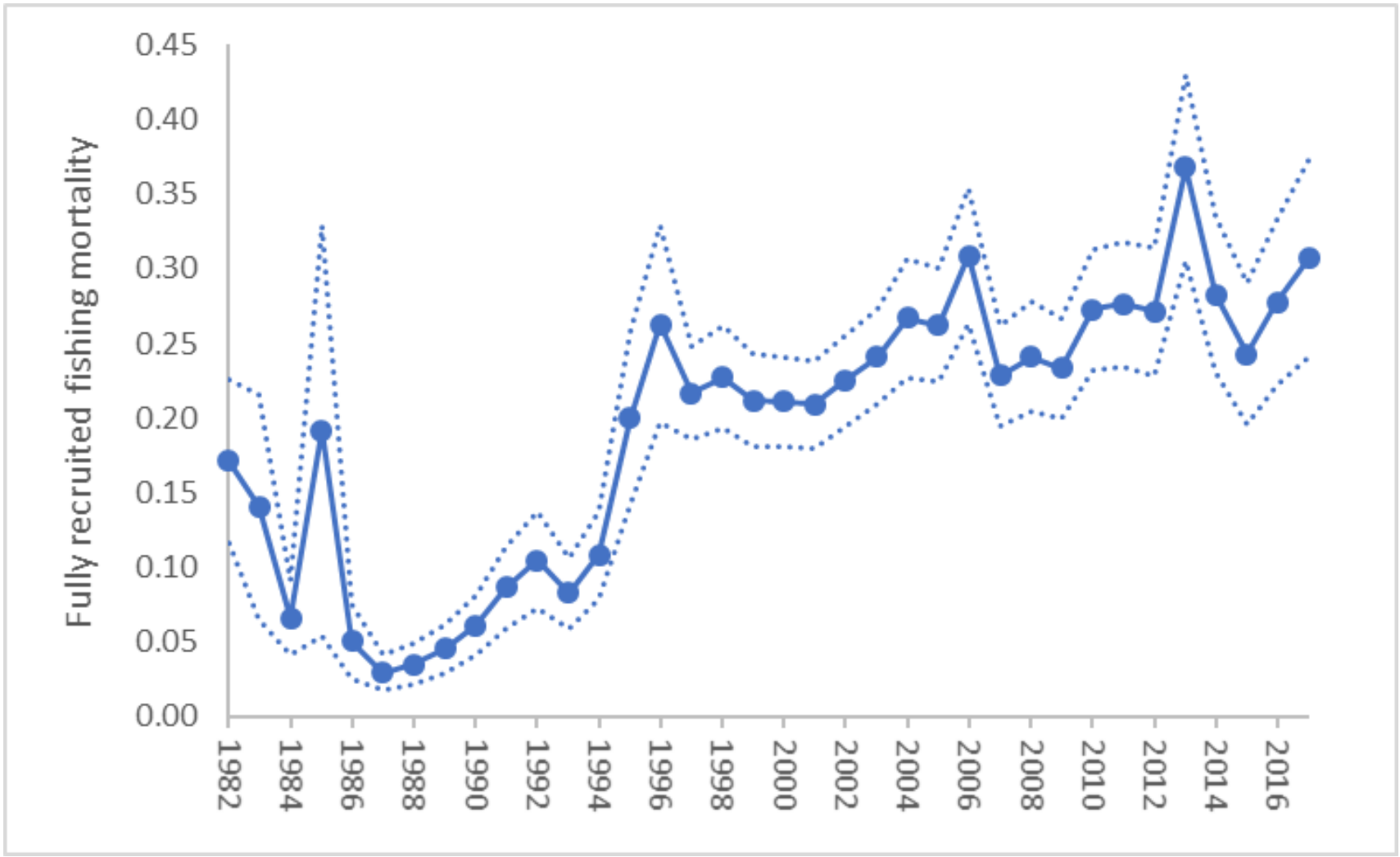
- Forward projecting statistical catch-at-age model
  - Age-1 abundance (recruitment) in each year
  - Fully-recruited F in each year
  - Catch selectivity in 4 regulatory periods
  - Catchability coefficients for all indices
  - Selectivity for each survey with age composition data

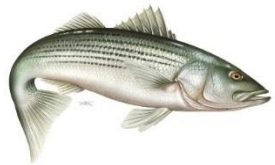
- Data are split into two “Fleets” based on regions
  - Chesapeake Bay & Coast
  - Improved selectivity fits
  - Provided partial F for each fleet

# Fully-recruited F (±1 SD) by 'Fleet'

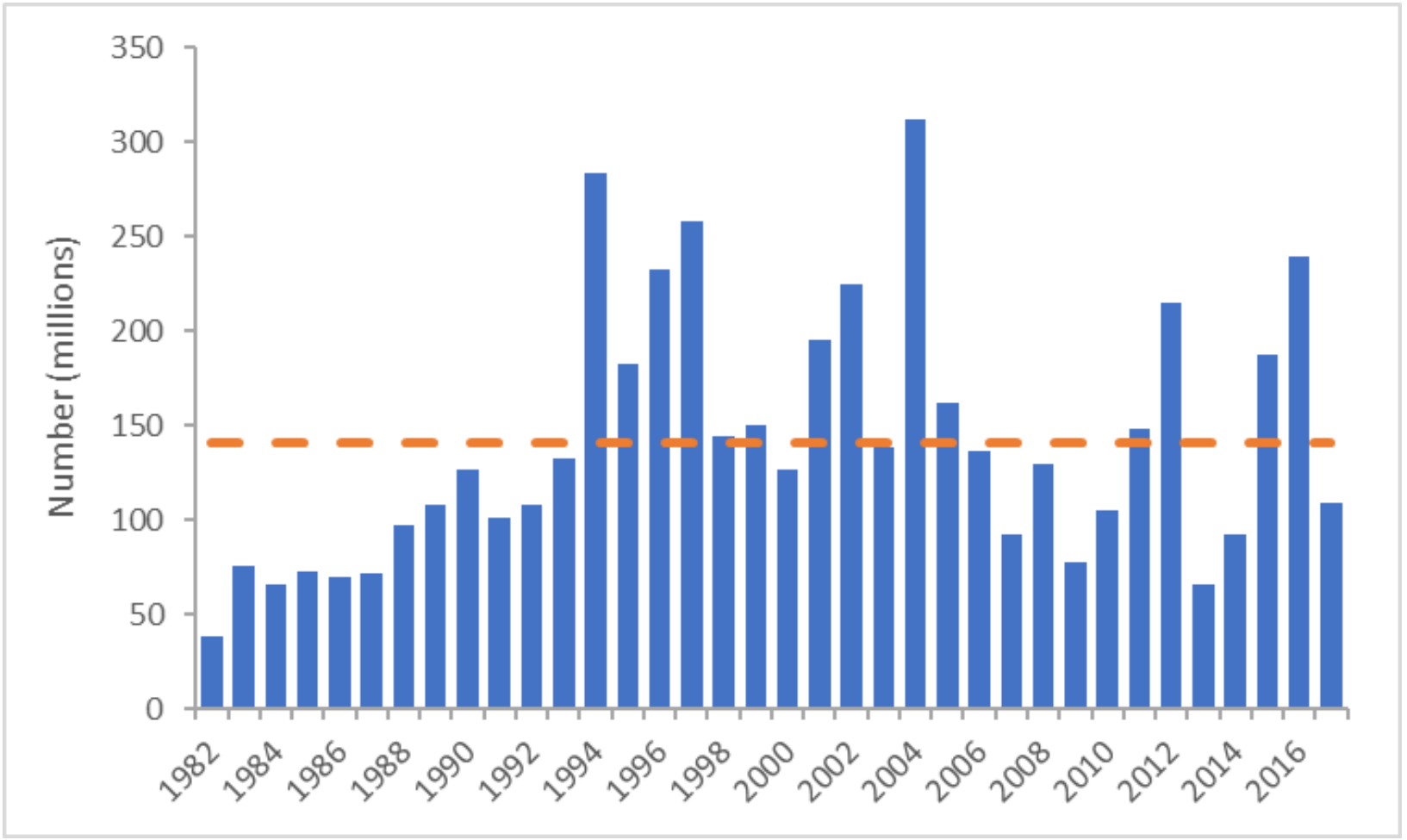


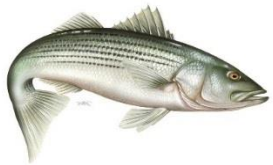
# Fully recruited F (±95% CI)



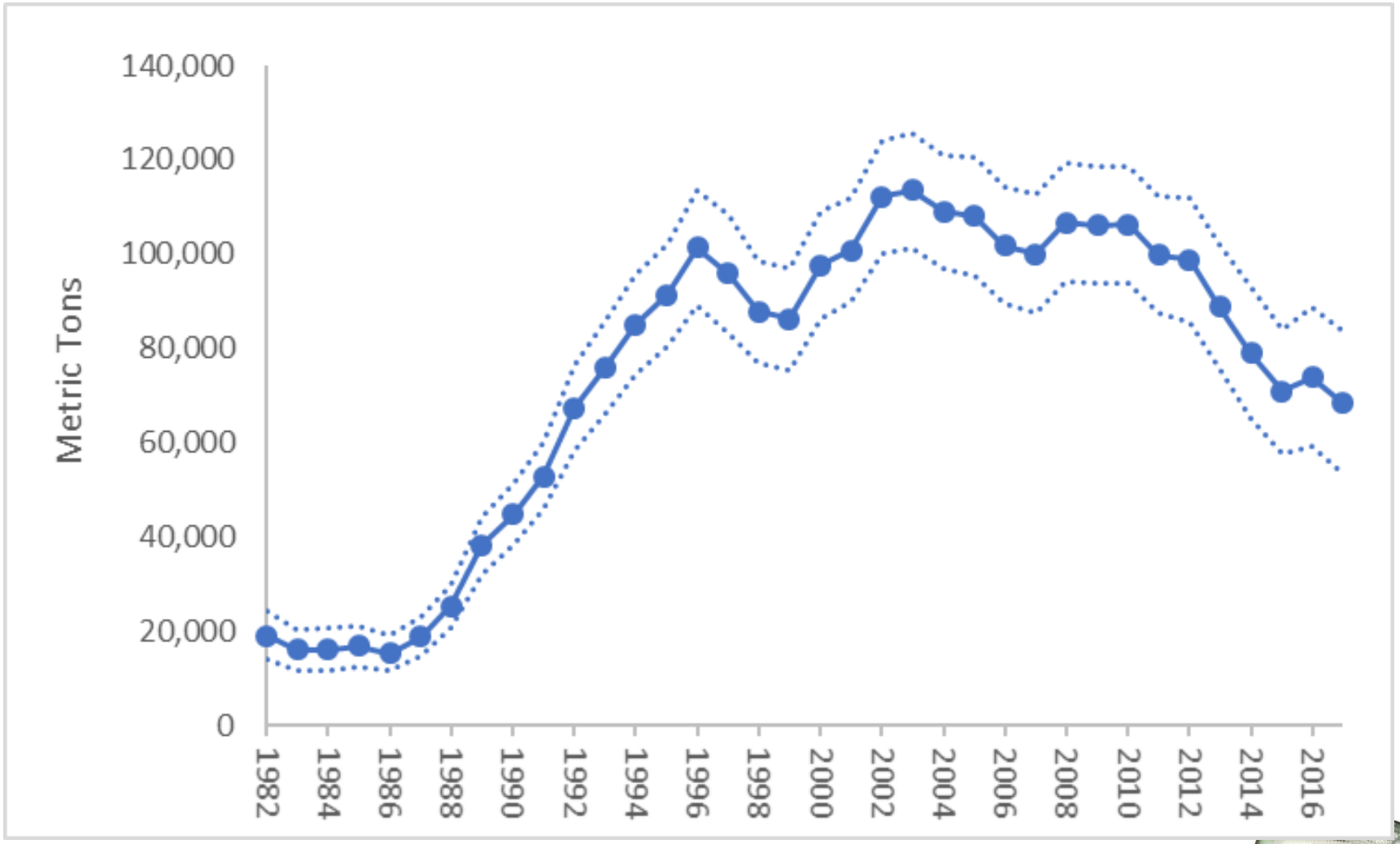



# Recruitment



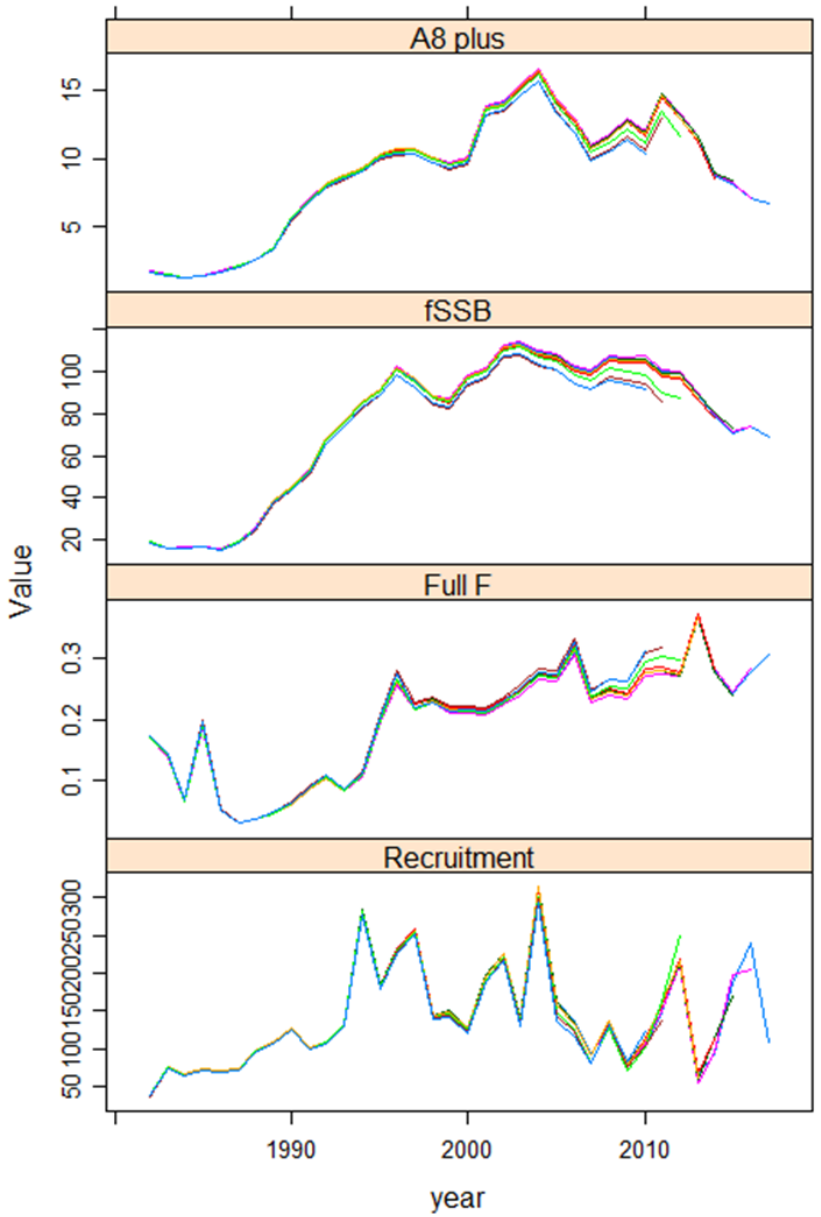



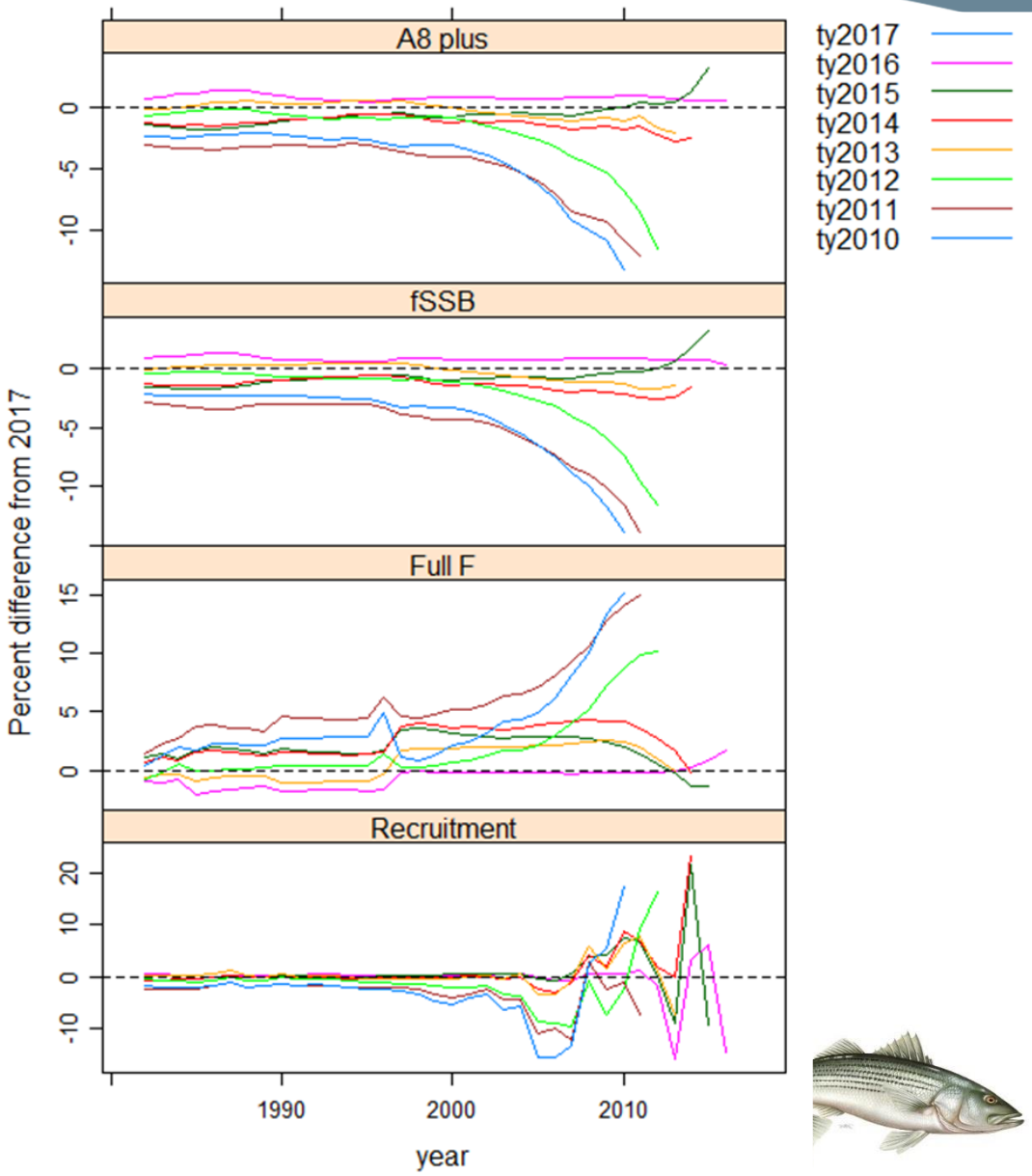
# Female Spawning Stock biomass (±95% CI)



# Retrospective

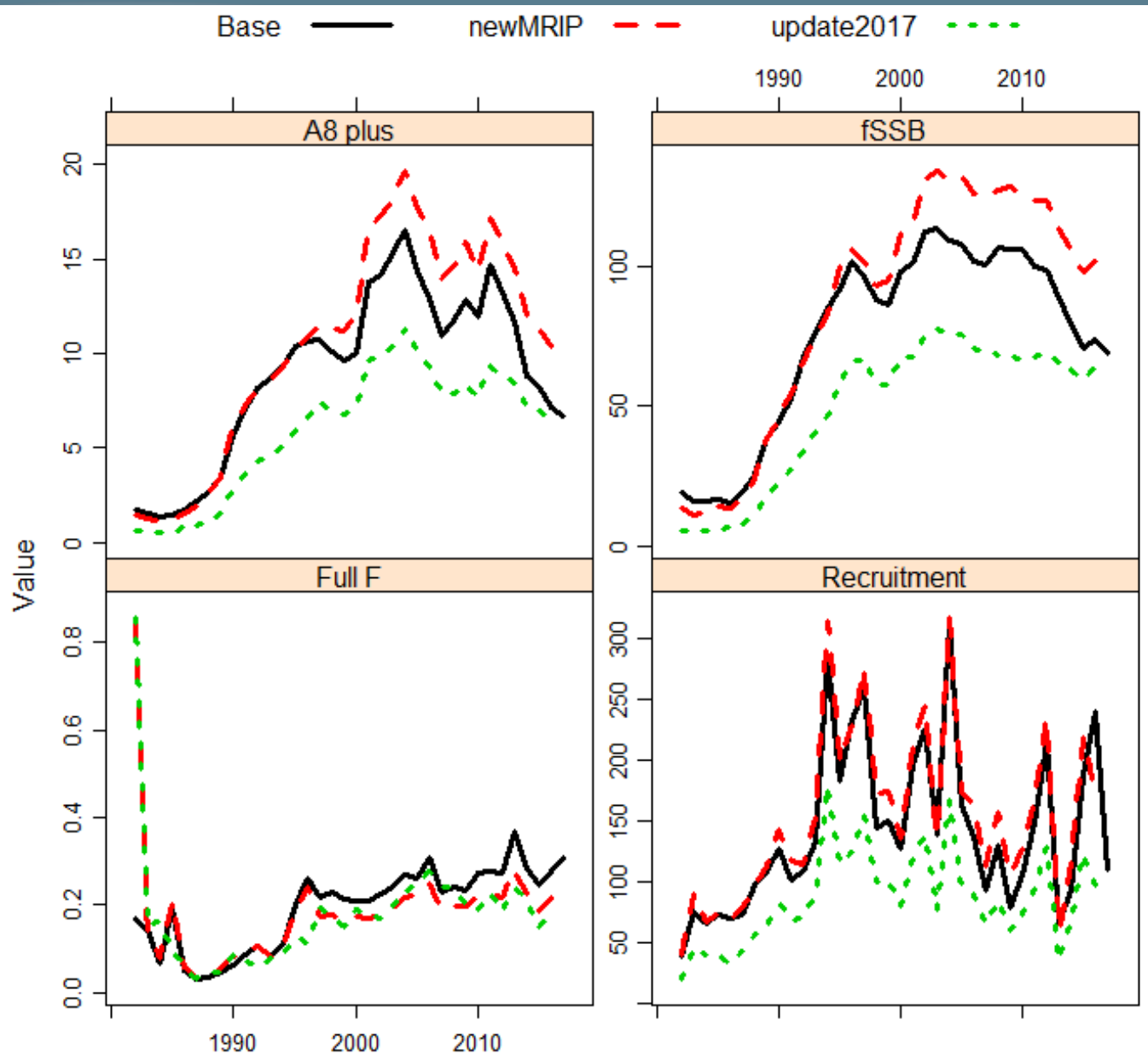
# Retrospective Analysis



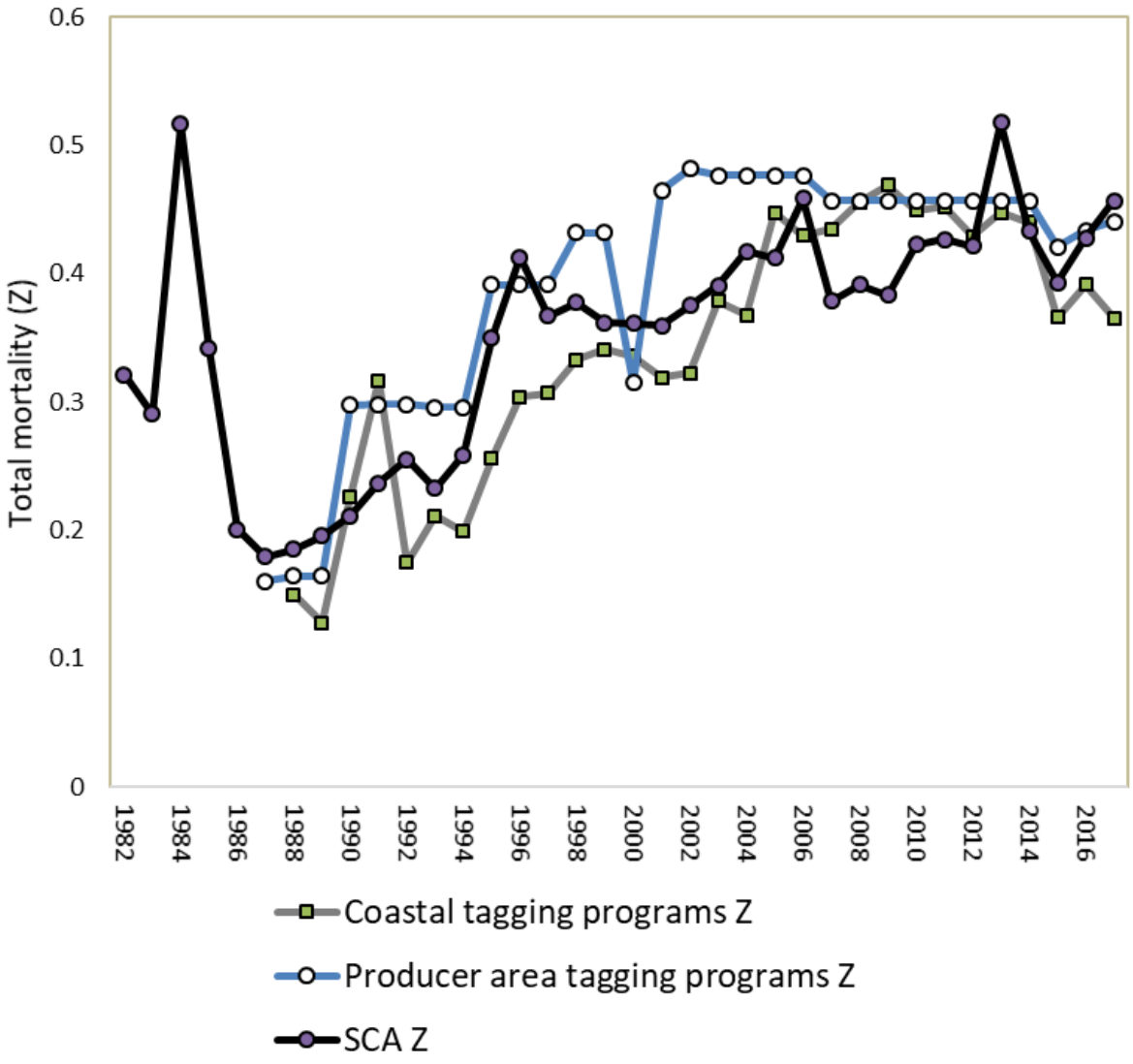
# Sensitivity Runs

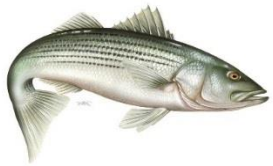
# Continuity & Bridge Building Run Comparisons



# SCA vs Tag Comparison of Total Mortality

# Total Instantaneous Mortality



# Reference Points

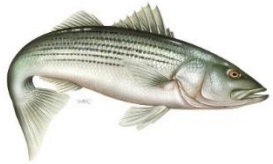
# BRPs Board Guidance

- TC explored model-based and empirical BRPs
- Model-based did not provide realistic SSB targets and thresholds

  →TC only put forward empirical BRPs (based on $SSB_{1995}$ and $SSB_{1993}$)

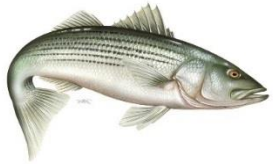
- Current model is not stock-specific, but it can provide regional-specific F guidance (Bay vs. coast)

  → TC would need guidance on balance of F between regions

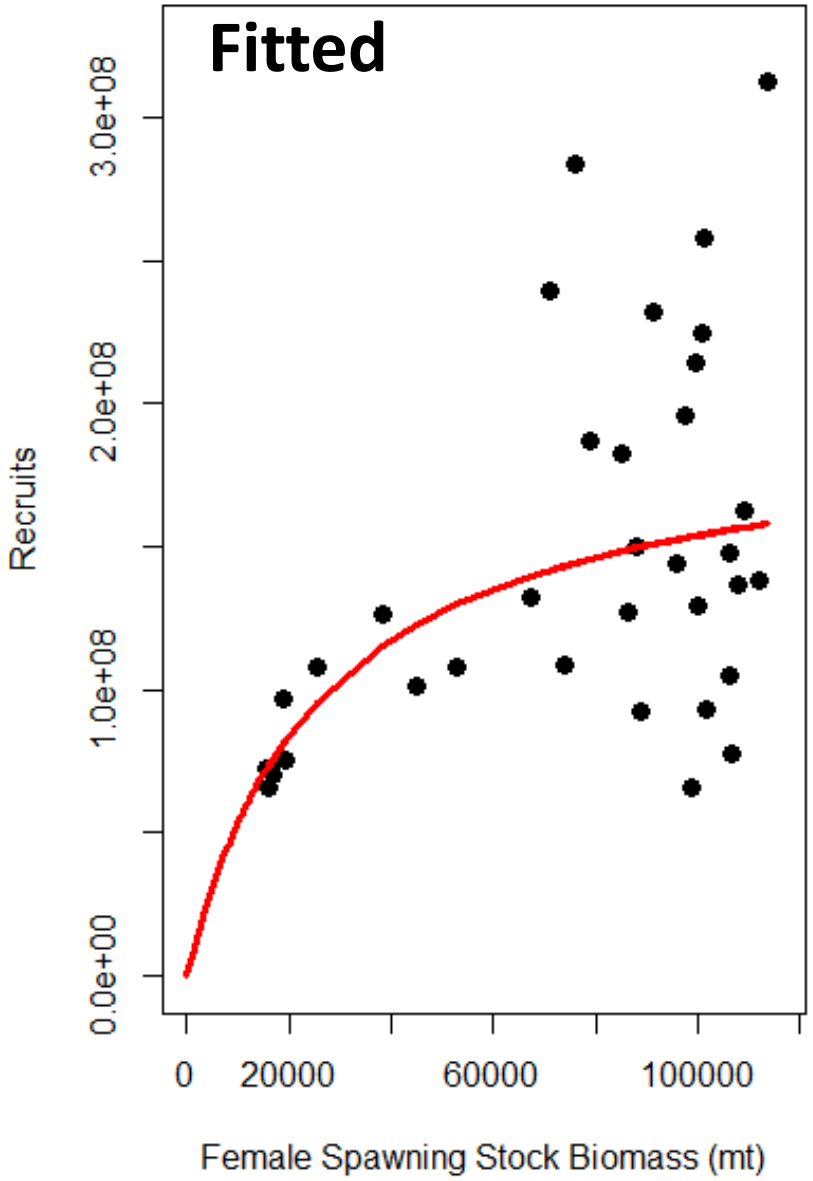


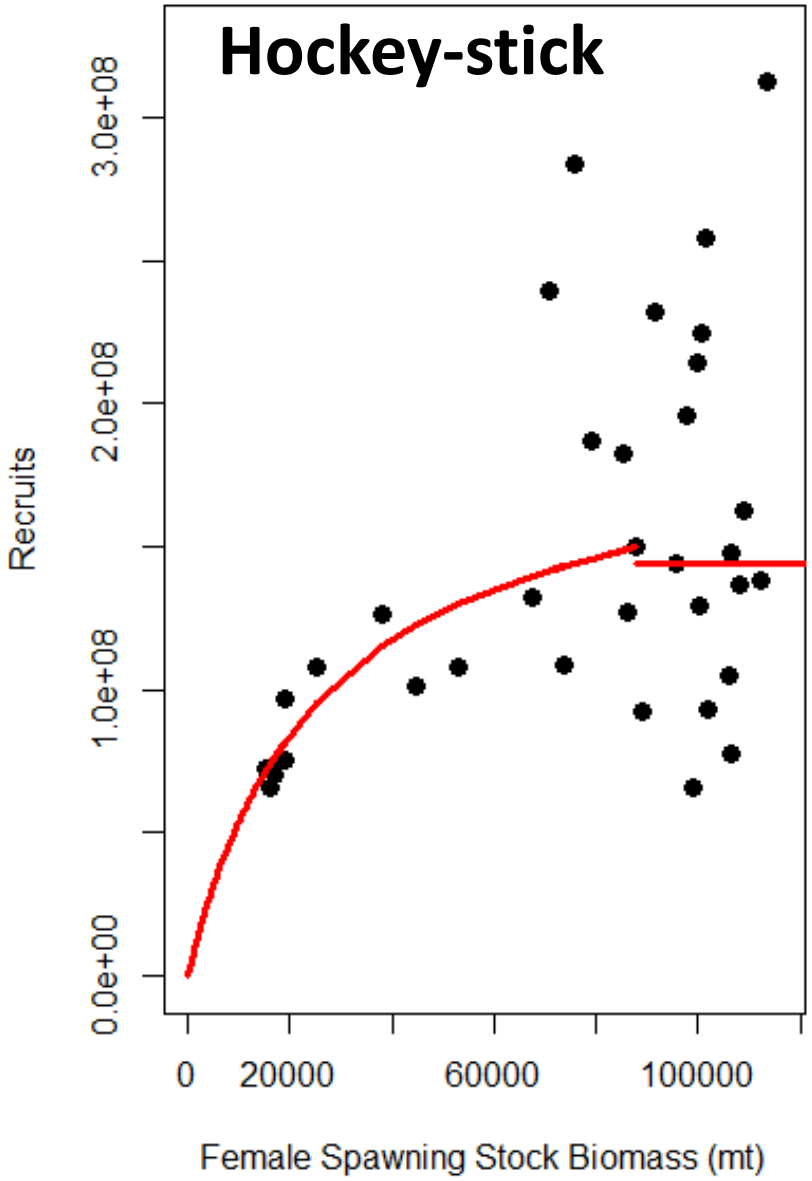
# Reference Points

- BRPs recalculated during 2018 assessment:
  - Sex ratio information remains the same
  - Natural mortality remains the same
  - Maturity information was updated
  - New SCA model results
  - Updated mean weights at age
  - Hockey-stick Beverton-Holt stock recruitment model



# Stock Recruitment Curve



# SAW/SARC 66 Updated Striped Bass BRPs

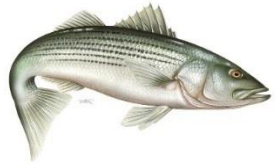
| Reference Point Definitions | | |
|---|---|---|
| | **Female SSB (MT)** | **F** |
| **Threshold** | Estimate of 1995 female SSB | F projected to achieve SSB Threshold |
| **Target** | 125% SSB Threshold | F projected to achieve SSB target |

| Reference Point Values | | |
|---|---|---|
| **Reference Point** | **Addendum IV, 2014** | **SARC 66, 2018** |
| $SSB_{Threshold}$ | 57,626 | 91,436 |
| $SSB_{Target}$ | 72,032 | 114,295 |
| $F_{Threshold}$ | 0.22 | 0.240 |
| $F_{target}$ | 0.18 | 0.197 |

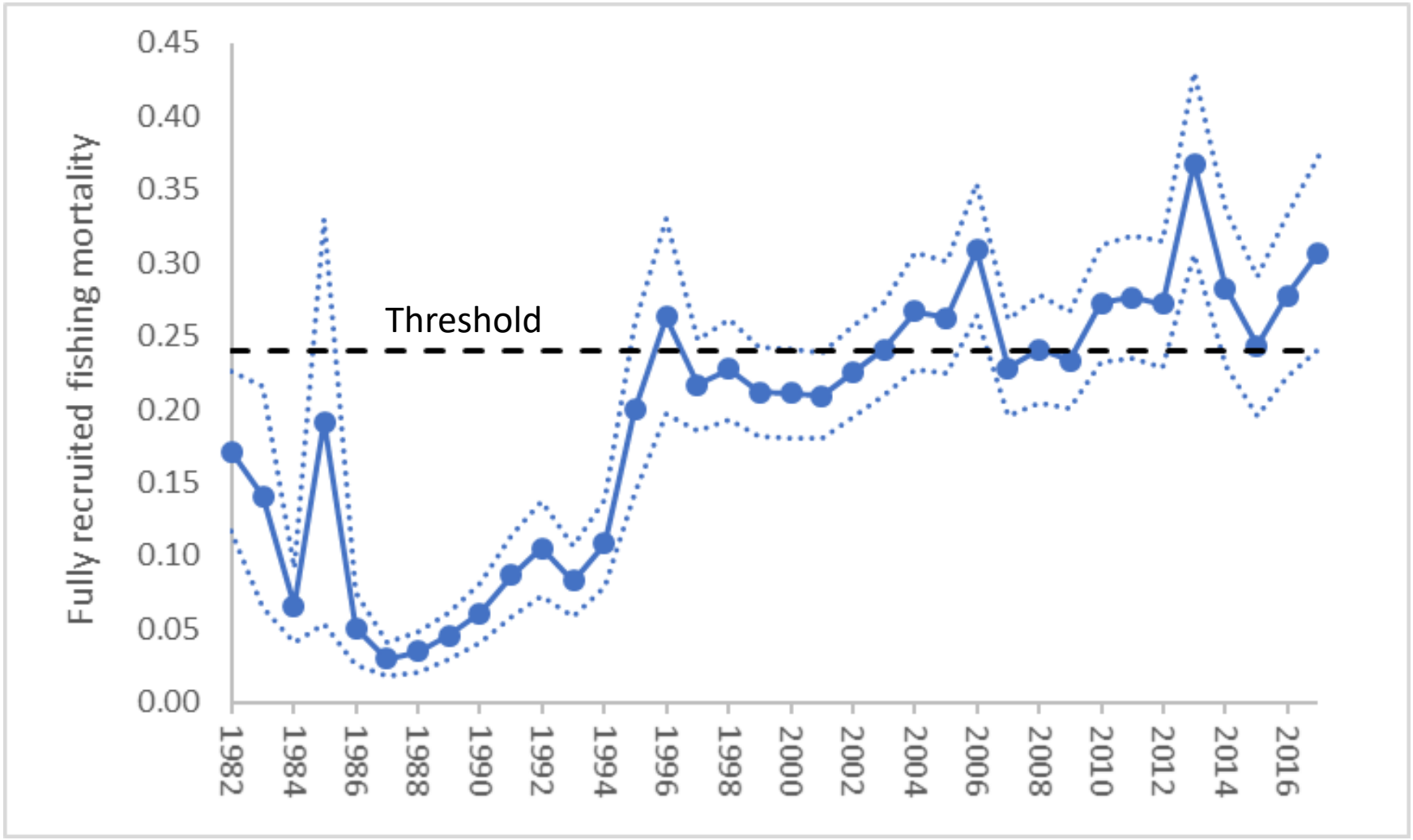
# Stock Status

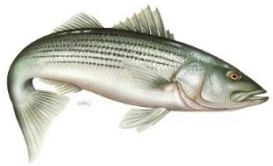
| Threshold definition | SSB ref (SE) | 2017 SSB (SE) | Overfished Probability $p(SSB_{2017} < SSB_{ref})$ |
|---|---|---|---|
| SSB 1993 | 75,906 (5,025) | 68,476 (7,630) | 84% |
| SSB 1995 | 91,436 (5,499) | | 100% |

| Threshold definition | F ref (CV) | 2017 F (SE) | Overfishing Probability $p(F_{2017} > F_{ref})$ |
|---|---|---|---|
| SSB 1993 | 0.278 (0.077) | 0.307 (0.034) | 76% |
| SSB 1995 | 0.240 (0.087) | | 95% |

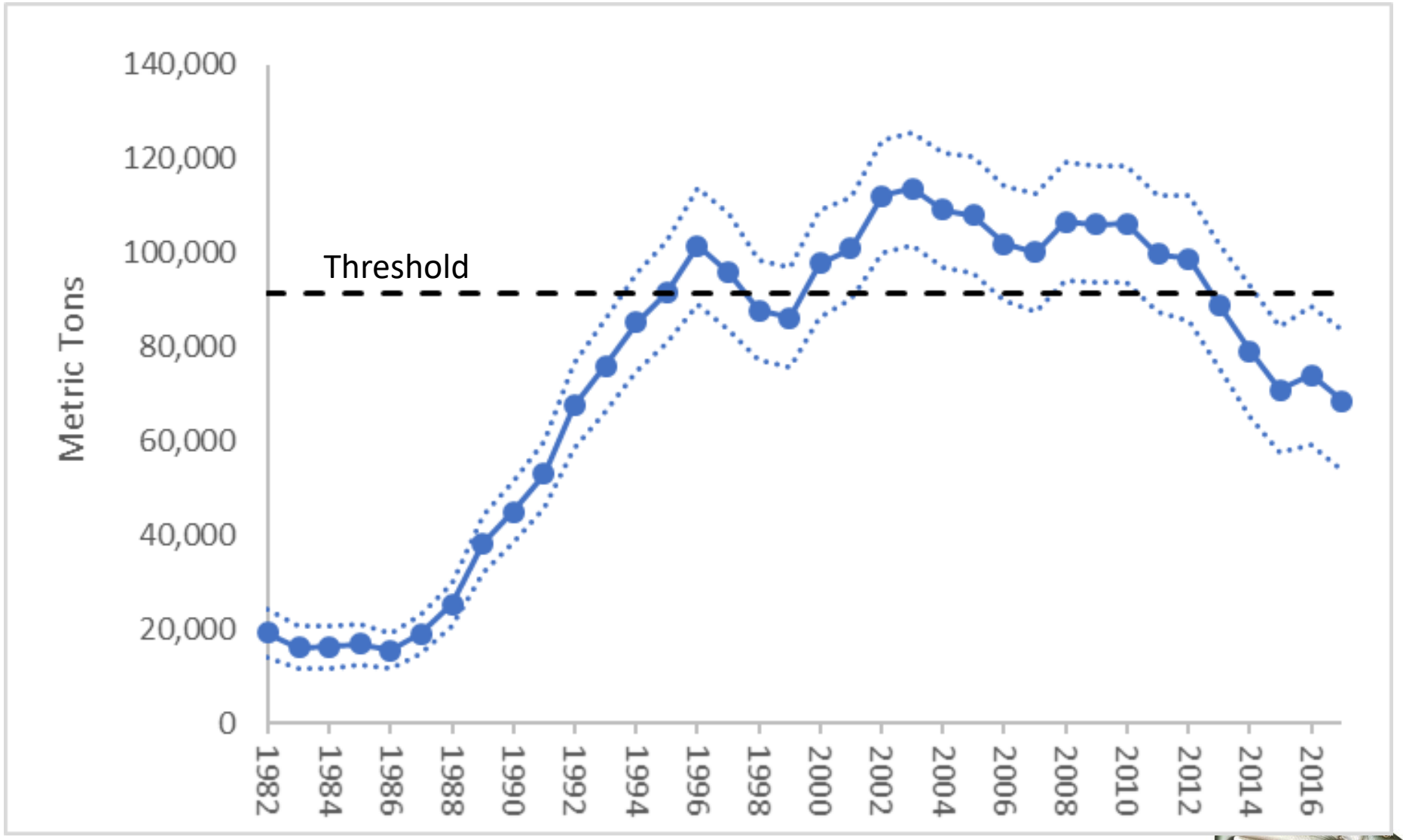


# Fishing Mortality (±95% CI)



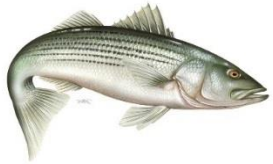
# Female Spawning Stock Biomass (±95% CI)



# Projections

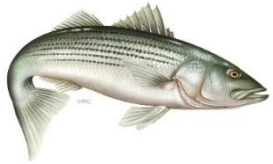
# Methods

- Examined 4 scenarios:
  - Constant 2017 catch: 7.1 million fish taken in 2018 – 2023
  - Constant F = $F_{2017}$ =0.307 for 2018-2022
  - Constant F = $F_{1993\ SSB\ threshold}$= 0.278 for 2018 – 2023
  - Constant F = $F_{1995\ SSB\ threshold}$= 0.240 for 2018 – 2023

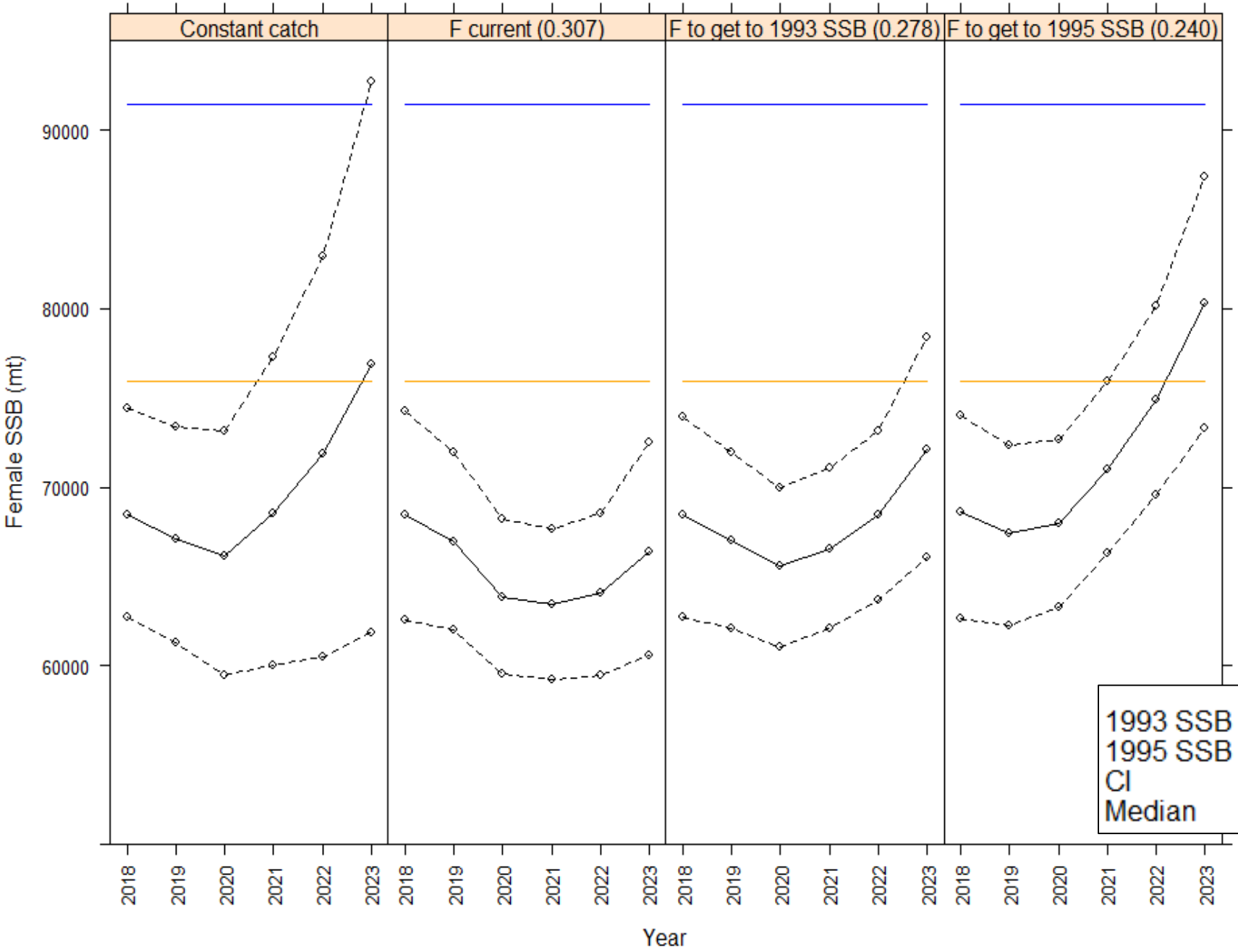


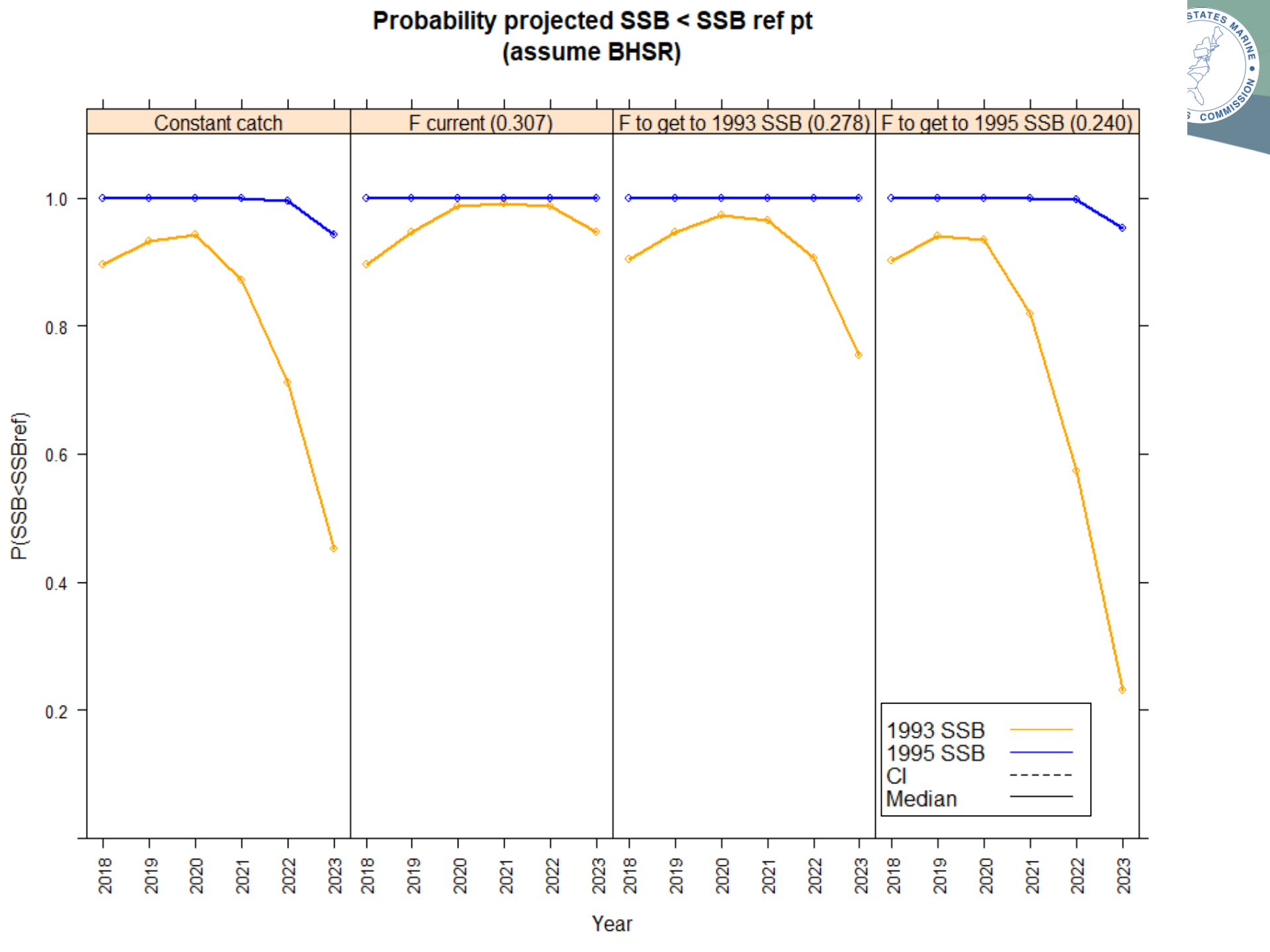
# Methods

- Projected 2017 abundance forward through 2023
- Used 2017 selectivity pattern & weights for 2017, avg 2013-2017 for 2018-2023
- Starting abundance in 2017 resampled 2,000 times
- Recruitment (2018-2023) from hockey-stick BHSR



# Short term projections w/ BHSR (TOR 6)




Probability projected SSB < SSB ref pt
(assume BHSR)
Constant catch
F current (0.307)
F to get to 1993 SSB (0.278)
F to get to 1995 SSB (0.240)
P(SSB<SSBref)
1.0
0.8
0.6
0.4
0.2
2018
2019
2020
2021
2022
2023
Year
1993 SSB
1995 SSB
CI
Median

# Questions?

# Maryland's Conservation Equivalency Effectiveness Report

*ASMFC Atlantic Striped Bass Board*

*Crystal City, Virginia*

*February 6, 2019*

# MD's CE Proposal – February 2018

*" Move to approve Option B, in Maryland's conservation equivalency proposal for its summer/fall recreational striped bass fishery in the Chesapeake Bay. Season, May 16 to December 15. Size and bag, 2 fish at 19 inch minimum, with only 1 fish allowed greater than 28 inches. Non-offset circle hooks required when fishing with bait, non-artificial lures. Additionally, Maryland will collect enforcement, compliance and other relevant information during 2018, and will report back to the Board with a conservation equivalency effectiveness review in February, 2019. "*

**Presentation will cover:**

- Current Maryland Gear Regulations (Chesapeake Bay Only)
- Outreach and Education Efforts
- Enforcement and Compliance
- Updated Analysis – Original Proposal

# Current Gear Regulations

**When chumming or live-lining,** a person recreationally angling in the Chesapeake Bay and its tidal tributaries during the periods May 16, 2018 through December 15, 2018 and May 16, 2019 through December 15, 2019 *shall only use a circle hook.*

**A circle hook is defined as:** a non-offset hook with the point turned perpendicularly back to the shank.

# Current Gear Regulations

**(Bait Fishing…but NOT Chumming or Live-Lining)…**when using fish, crabs, or worms as bait, or processed bait, a person recreationally angling in the Chesapeake Bay and its tidal tributaries during the periods May 16, 2018 through December 15, 2018 and May 16, 2019 through December 15, 2019 *shall only use a: (a) Circle hook; or (b) "J" hook.*

**Circle Hook**

**Treble Hook**

**J Hook**

# Outreach and Education




- Emails to 100K addresses
- Industry Seminars
- Facebook & Twitter
- Radio Interviews
- 21,000 business cards, 700 index cards, 100 posters and 500 stickers.

# Enforcement and Compliance

Saturation patrols conducted over the summer resulted in compliance with circle hook use at nearly 100%

Field officers reported high compliance

---

872 Anglers provided answers to a Circle Hook Questionnaire

- 400 were not chumming, live-lining or using bait
- Chummers had a 94% compliance rate
- Live-Liners had a 97% compliance rate
- Others using baited hook…30% were using circle hooks

ACCSP

Good Data, Good Decisions

# Updated Analysis

| | Original Analysis | | Updated Analysis | | |
|---|---|---|---|---|---|
| **Wave** | **Artificials** | **Bait** | **Artificials** | **Bait** | **Proportion Bait Anglers Using Circle Hooks** |
| 3 | 0.42 | 0.58 | 0.41 | 0.59 | 0.49 |
| 4 | 0.25 | 0.75 | 0.39 | 0.61 | 0.26 |
| 5 | 0.50 | 0.50 | 0.56 | 0.44 | 0.63 |
| 6 | 0.75 | 0.25 | 0.70 | 0.30 | 0.32 |

- For Artificial v Bait use by wave our original assumptions were close
- The proportion of bait anglers using circle hooks was a bit different from our original assumption of 100%
- Our regulations allowed J-Hooks when bait fishing

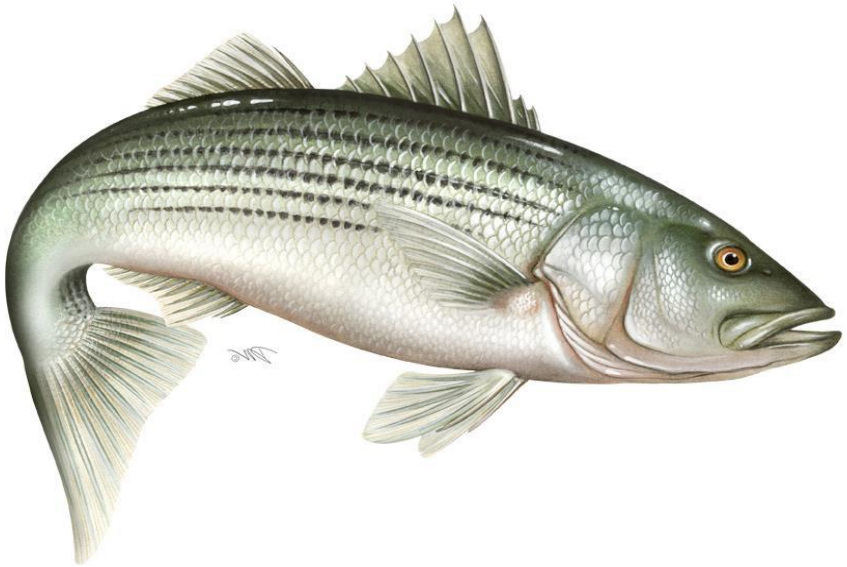
# Updated Analysis

| | **Proportion Change in Dead Discards** | **Proportion Change in Harvest** | **Proportion Change in Total Removals** |
|---|---|---|---|
| Original Proposal | -0.28 (-0.31 to -0.24) | 0.21 (0.11 to 0.37) | 0.00 (-0.08 to 0.07) |
| Updated Analysis | -0.12 (-0.14 to -0.10) | 0.21 (0.11 to 0.38) | 0.06 (-0.01 to 0.13) |

- We updated the assumptions in our original analysis (CE Proposal - 2018)
- Results indicate that our updated proportional change in total removals falls within the range of our original proposal.

# Questions?

# Changes to Virginia's Striped Bass Monitoring and Tagging Programs – Technical Committee Report

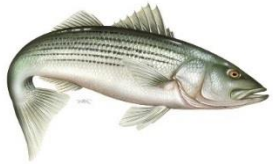


Atlantic Striped Bass Management Board

February 6, 2019

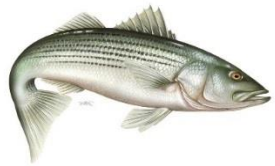
# Overview

- Background
- Rationale for Program Changes
- 2018 Changes to Virginia Programs
- Technical Committee (TC) Review and Comments



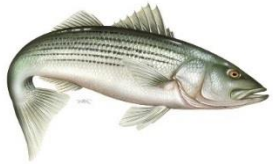
# Background – VA Programs

- Started in 1992
- Primarily conducted on Rappahannock River using comm. pound nets
- Supplemented with fyke net and/or gill net samples from James and York Rivers during certain periods
- Only long term consistent sampling from Rappahannock pound nets



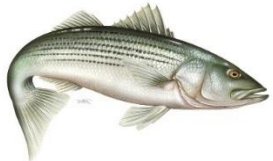
# Background – VA Programs

- Rationale for program changes:
  - VA pound net data previously used as abundance index in assessment, dropped from benchmark stock assessment in 2018
  - Recent staffing changes in VA
  - Funding reductions in VA



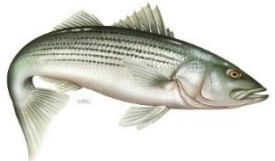
# 2018 Changes to VA Programs

- Changes implemented in 2018:
  - Pound net sampling replaced with multi-panel anchor gill net sampling
  - Tagging conducted through electrofishing
  - Sampling and tagging in both the James and Rappahannock Rivers
  - Both programs successful in 2018 in terms of establishing protocols and number of specimens sampled and tagged



# TC Review and Comments

- Amend. 6 requires all spawning stock survey changes to be reviewed and approved by the TC
- TC reviewed changes via conference call on 1/10/19
- TC unanimously approved the program changes

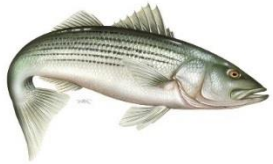


# TC Review and Comments

- Reducing the soak time may reduce unnecessarily high sample sizes and gear saturation

- The program only samples the Rappahannock and James Rivers, not the York, so it is missing information on one of the spawning grounds

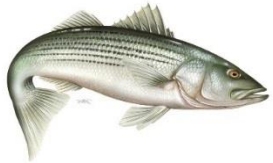
→ The FMP only specifies the Rappahannock and James Rivers



# TC Review and Comments

- Monitoring program requirements listed in the FMP may not support future data and assessment needs

- Recommend the Board consider changes to the FMP to update and improve those requirements in consultation with the TC



# Questions???