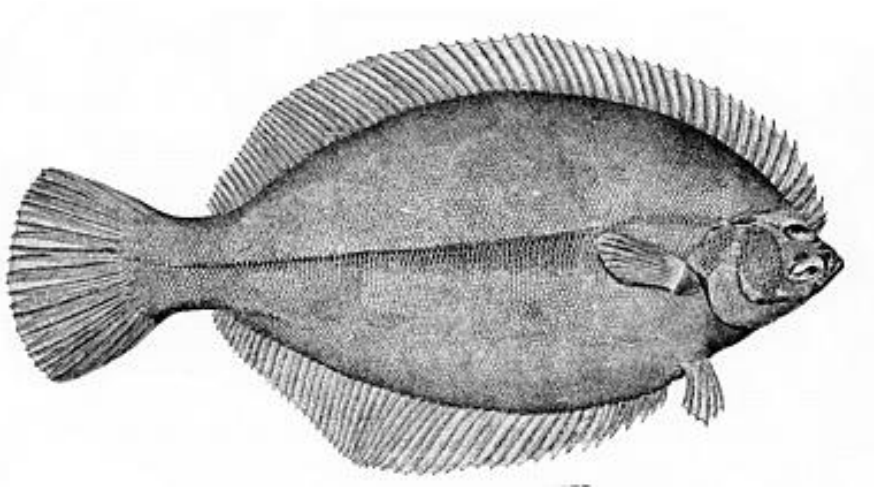
NOAA FISHERIES

NEFSC

June Management Track Assessment Review Meeting

Southern New England Winter Flounder

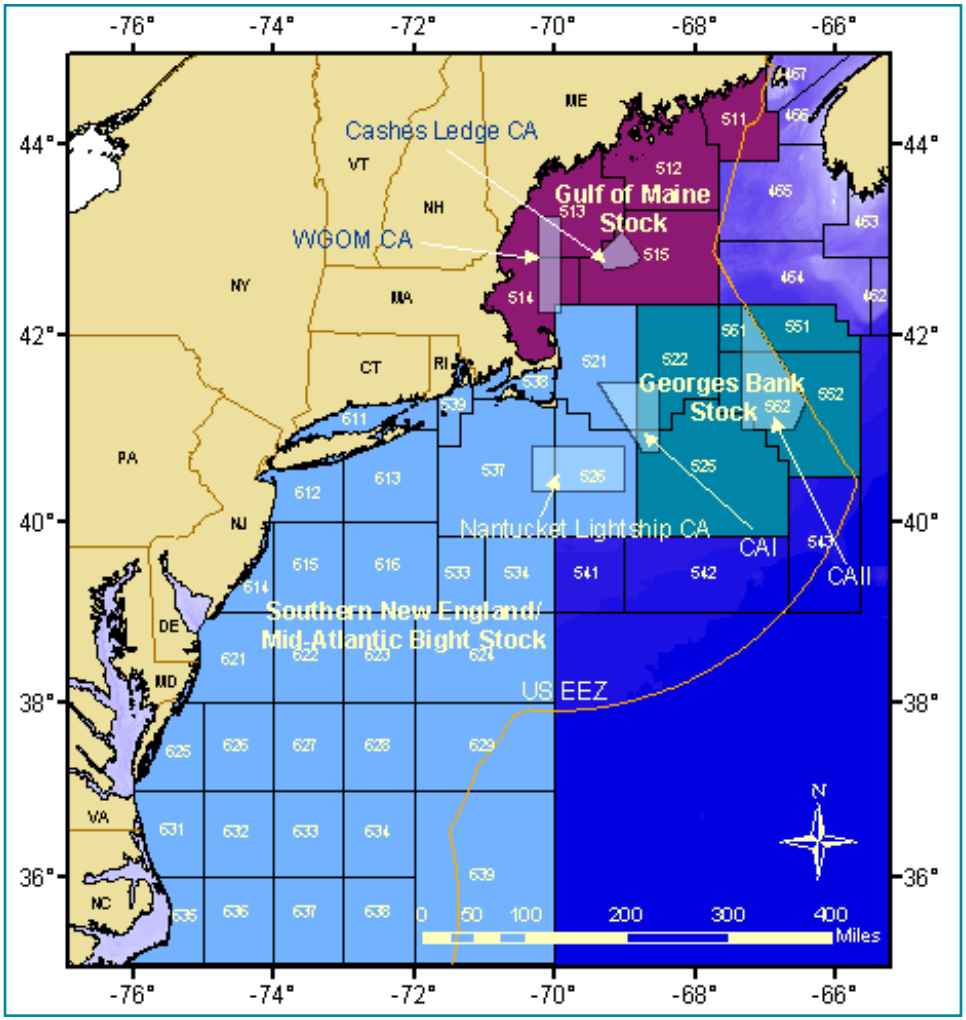
Pseudopleuronectes americanus



June 28th 2022

Southern New England Winter Flounder

- Last assessment: 2020 Multispecies groundfish
- Statistical catch-at-age model: ASAP ages 1-7+, years 1981-2019
- Reference points: F_{MSY} = 0.284, SSB_{MSY} = 12,322 MT
- Stock status: overfished (SSB_{2019} = 3,638 MT), overfishing not occurring (F_{2019} = 0.077)



TOR 1: Estimate catch from all sources including landings and discards

Fishery Dependent: 1981-2021 ages 1-7+

- Commercial Landings: AA Tables (1981-2019) and CAMS (2020-2021), by market category and quarter or half year
- Commercial Discards: SBRM (based on CAMS Kall 2020-2021)
- Recreational Landings: MRIP calibrated (A+B1)
- Recreational Discards: MRIP calibrated (B2)

CAMS vs AA comparison for 2019

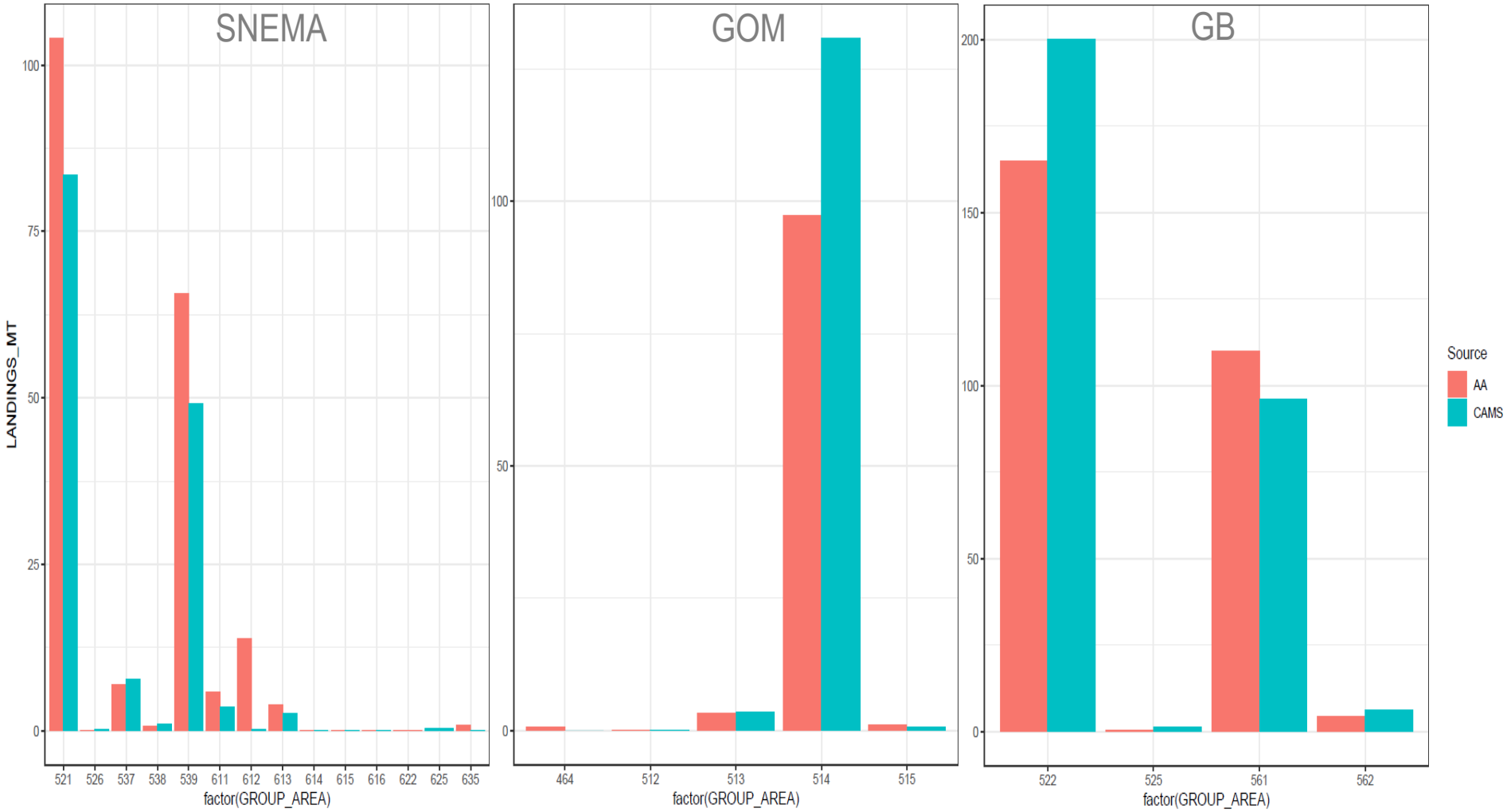
CAMS shifted landings between stocks

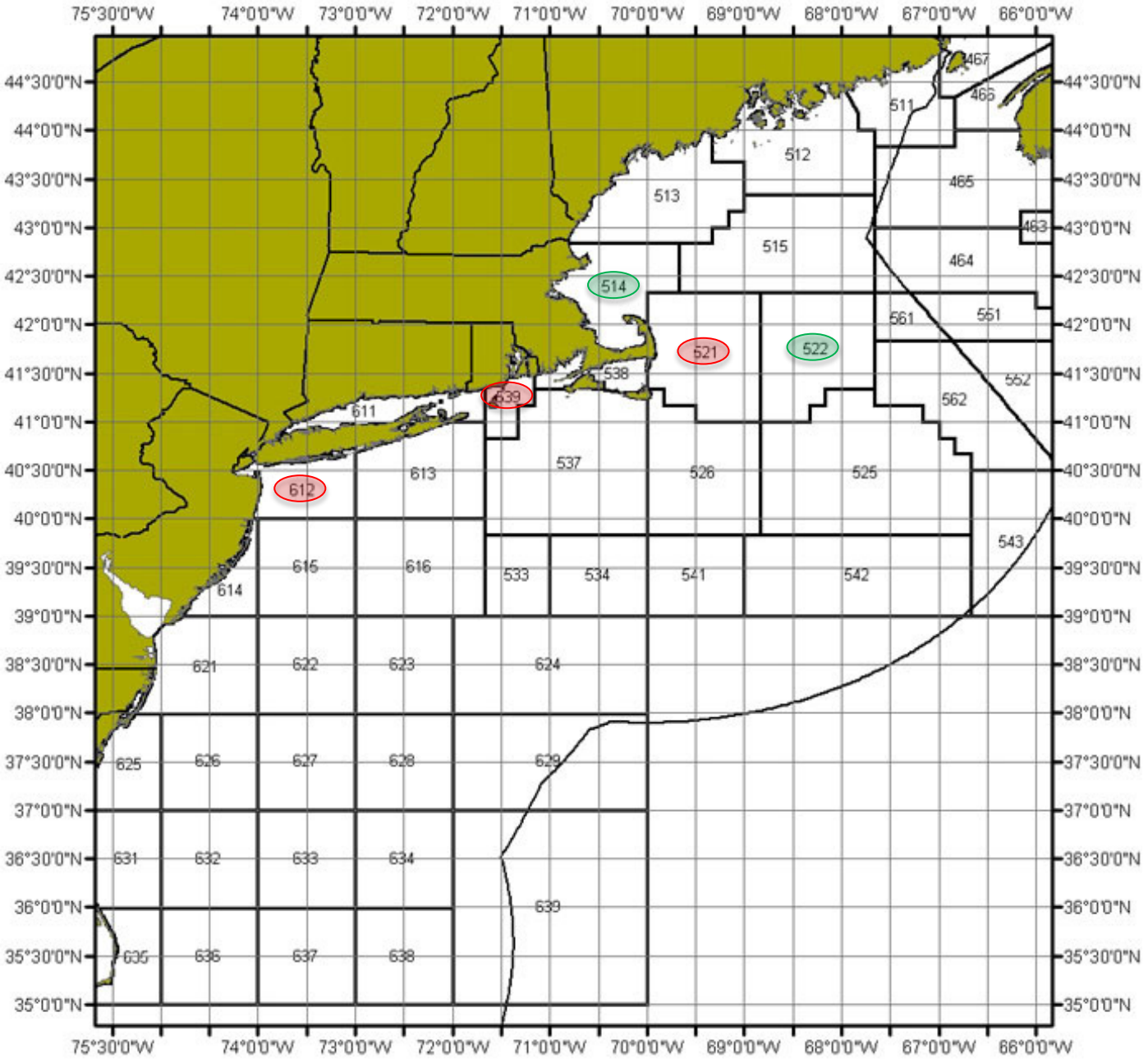
2019 AA Table			2019 CAMS			Difference (CAMS-AA)		
SNEMA	GOM	GB	SNEMA	GOM	GB	SNEMA	GOM	GB
202.016	102.414	279.979	148.582	135.008	303.769	-53.434	32.594	23.79
584.409			**587.359**			**2.95**		

- Total landings for 3 winter flounder stocks consistent between CAMS and AA
  - CAMS ~3MT greater than AA

- SNEMA stock loses 53.4 MT, GOM gains 32.5 MT, and GB gains 23.8 MT

CAMS vs AA by Stat Area

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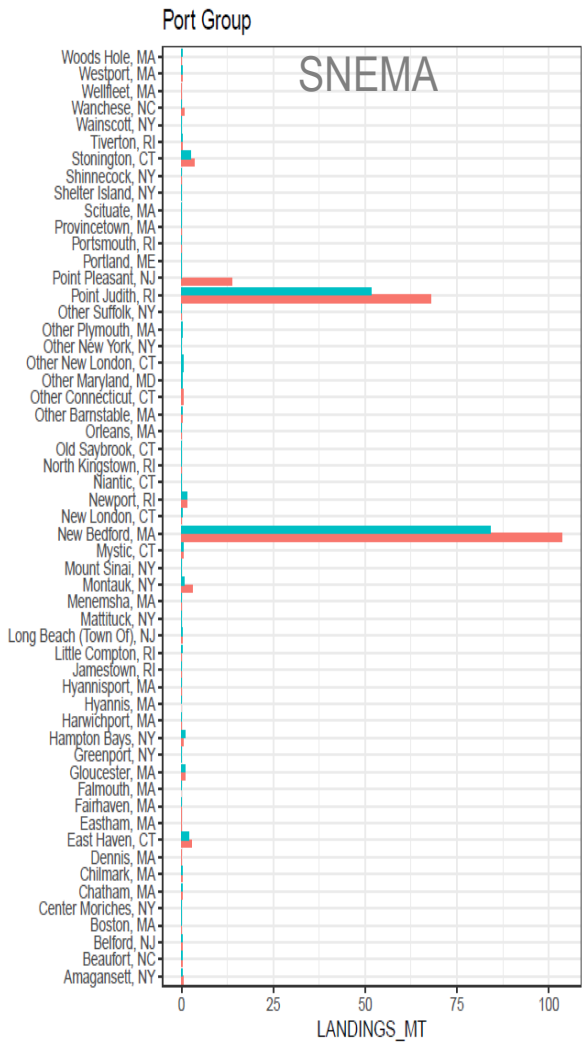
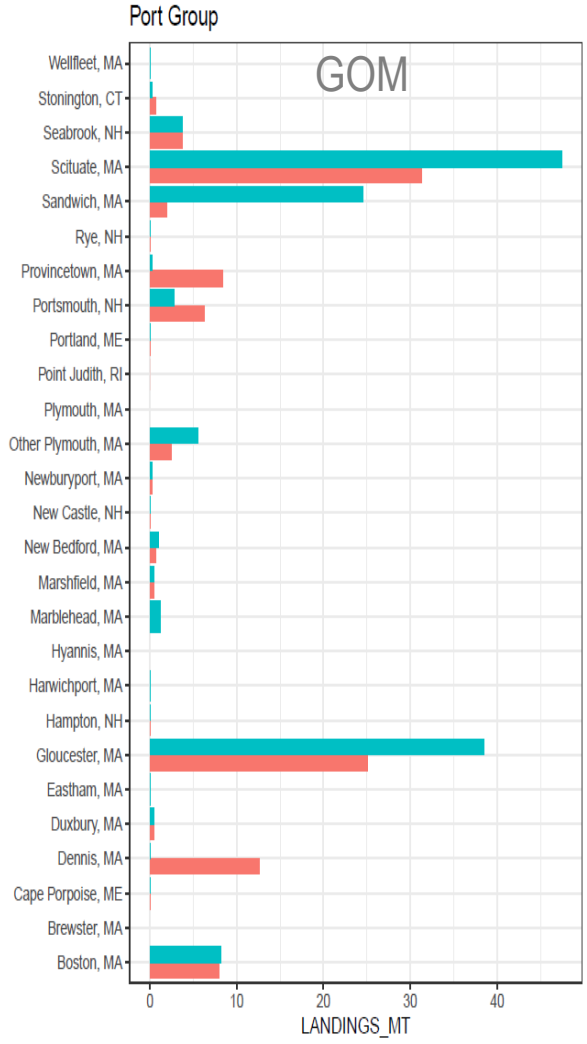
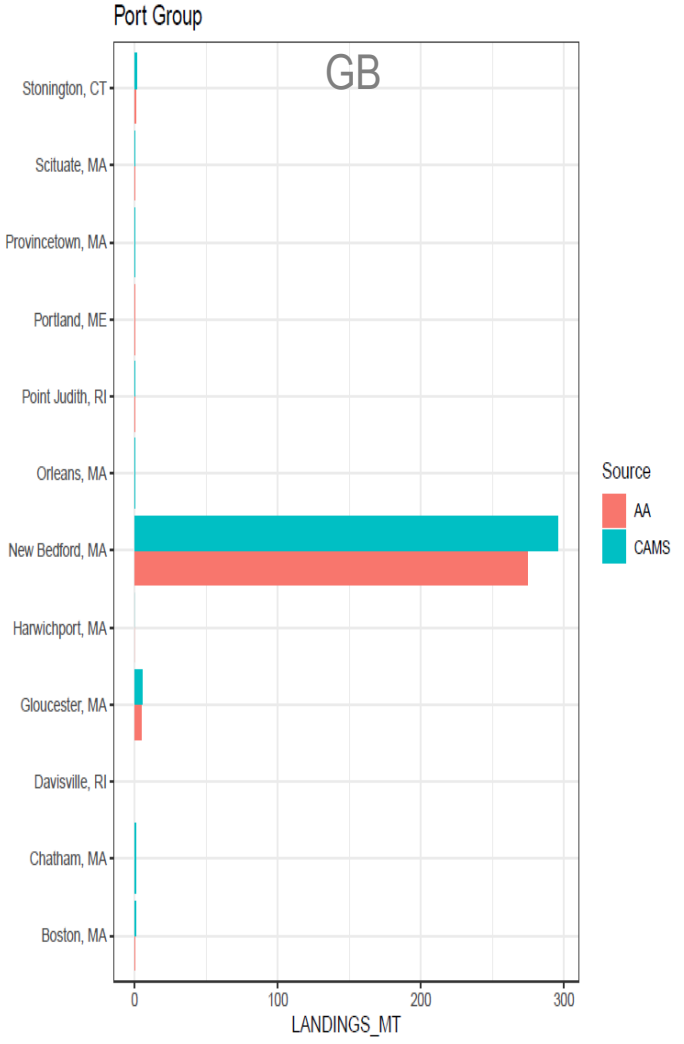
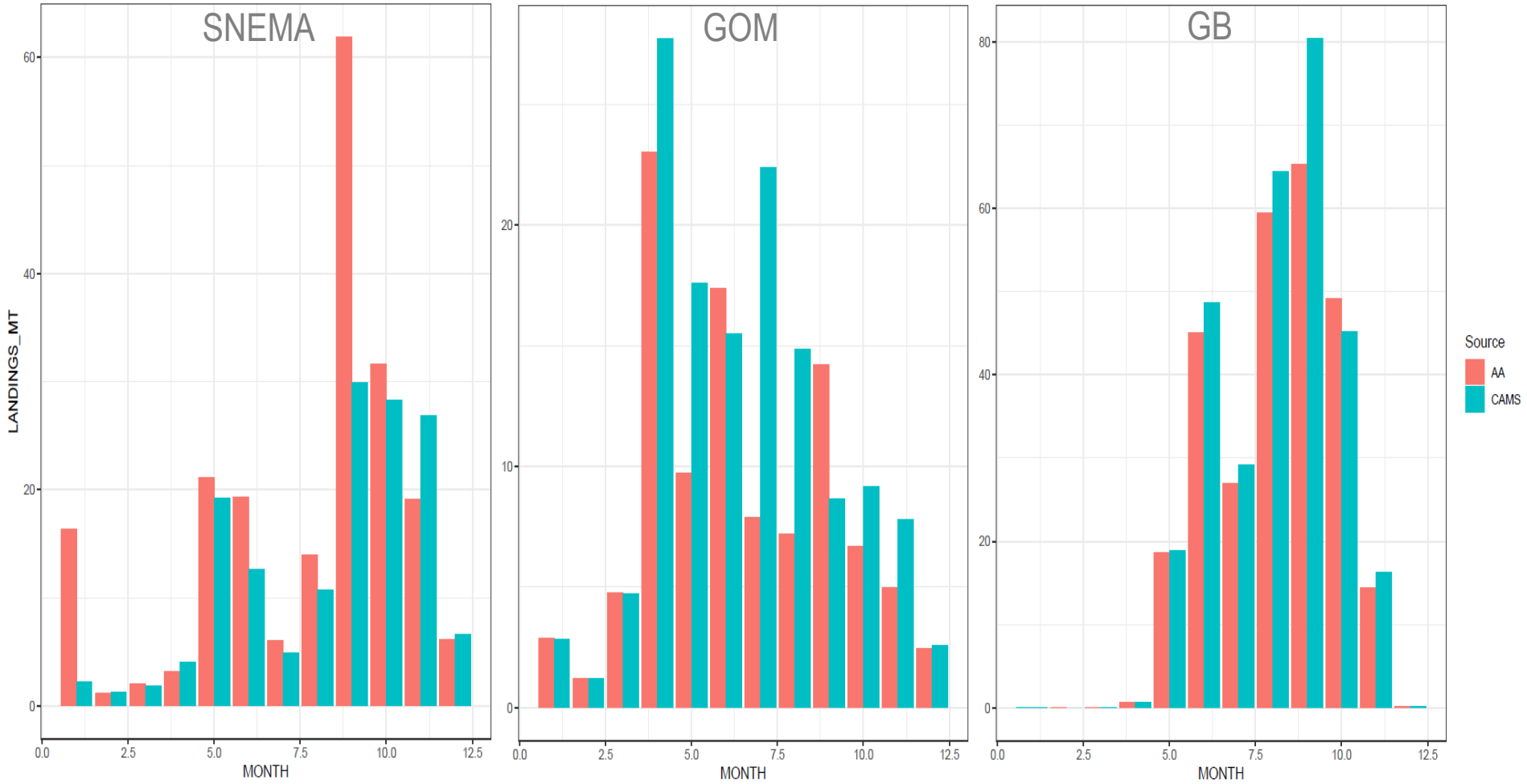
CAMS vs AA by Port



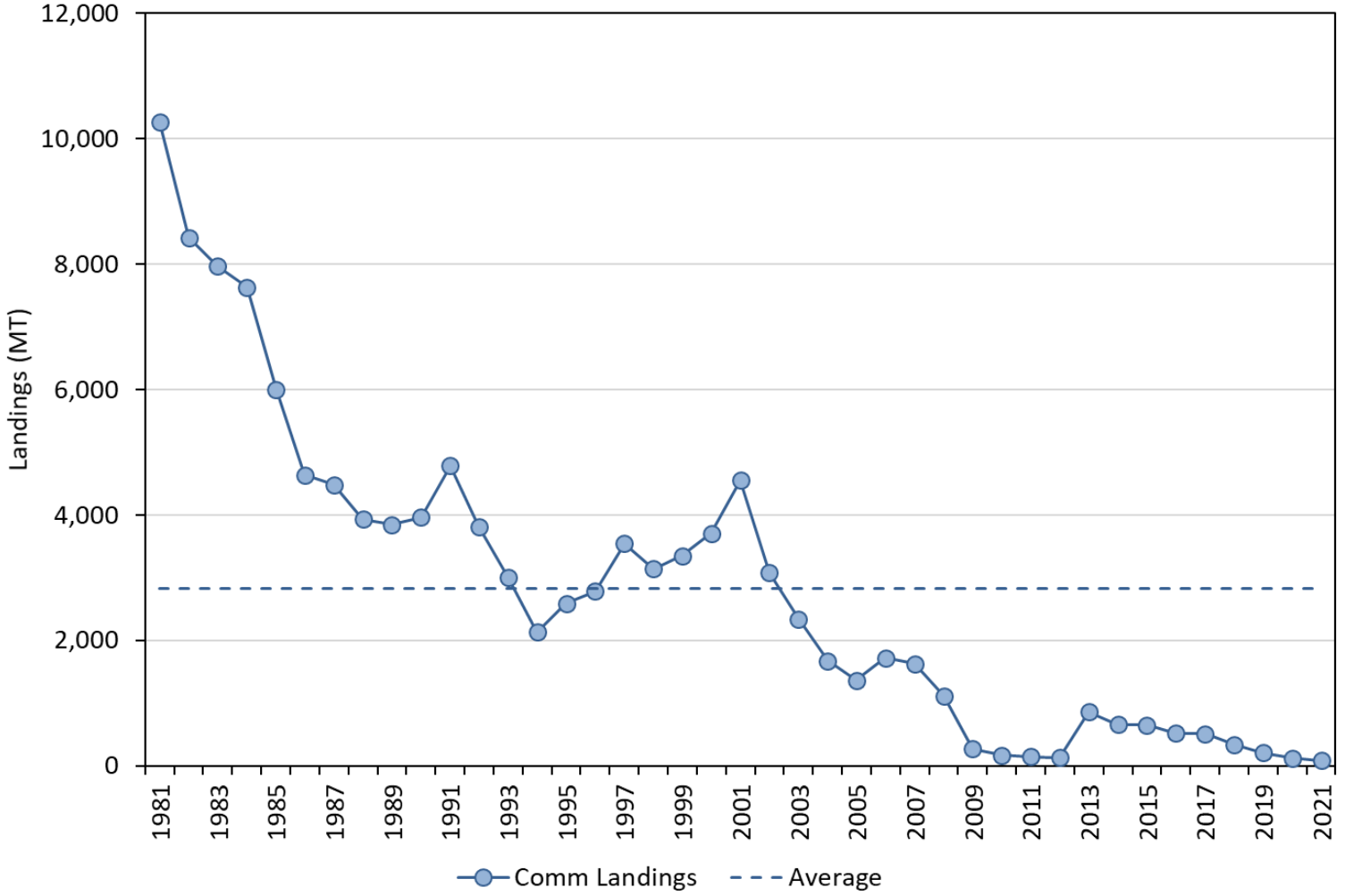




CAMS vs AA by Month

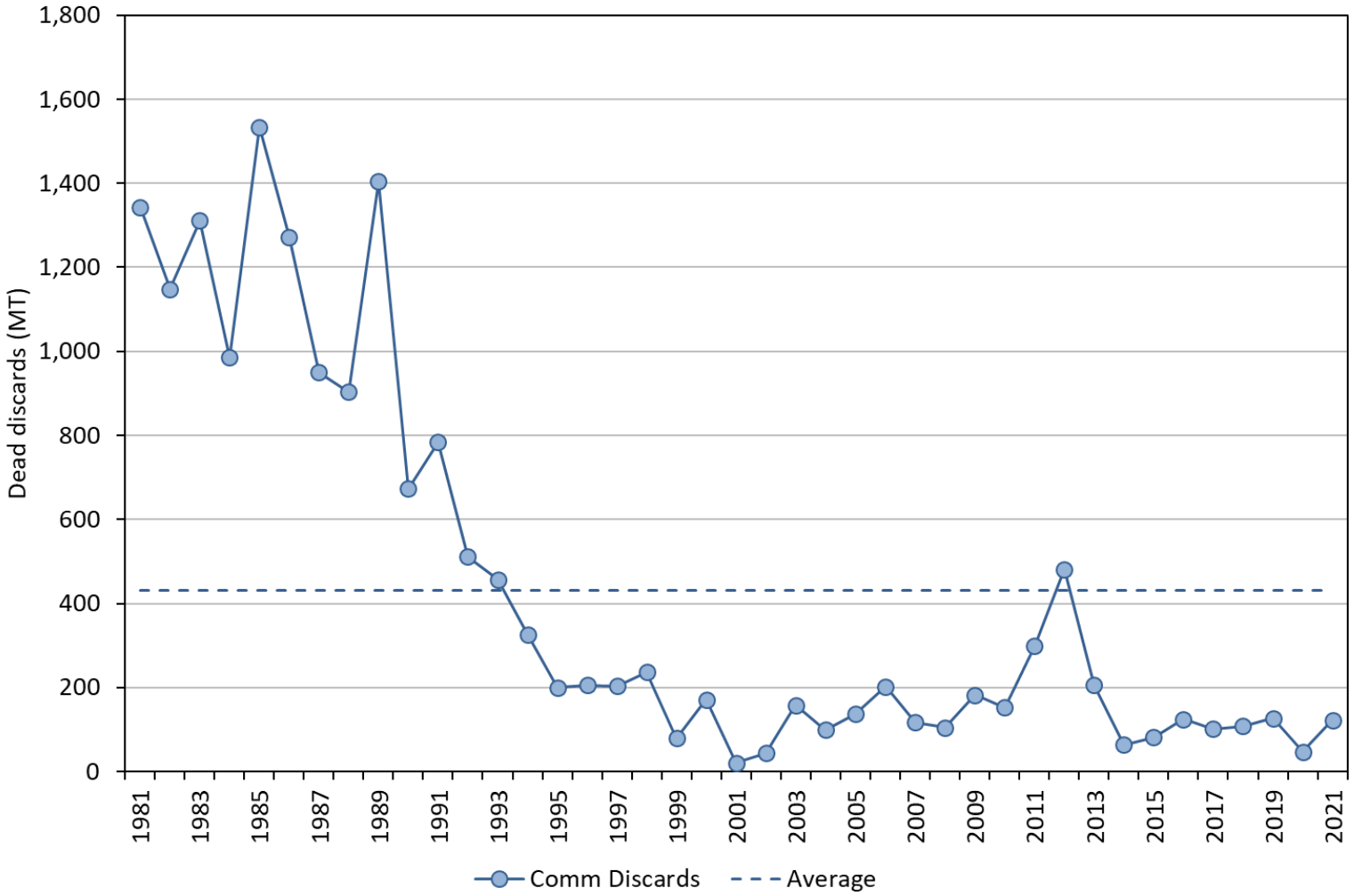


SNEMA WFL Commercial Landings 1981-2021



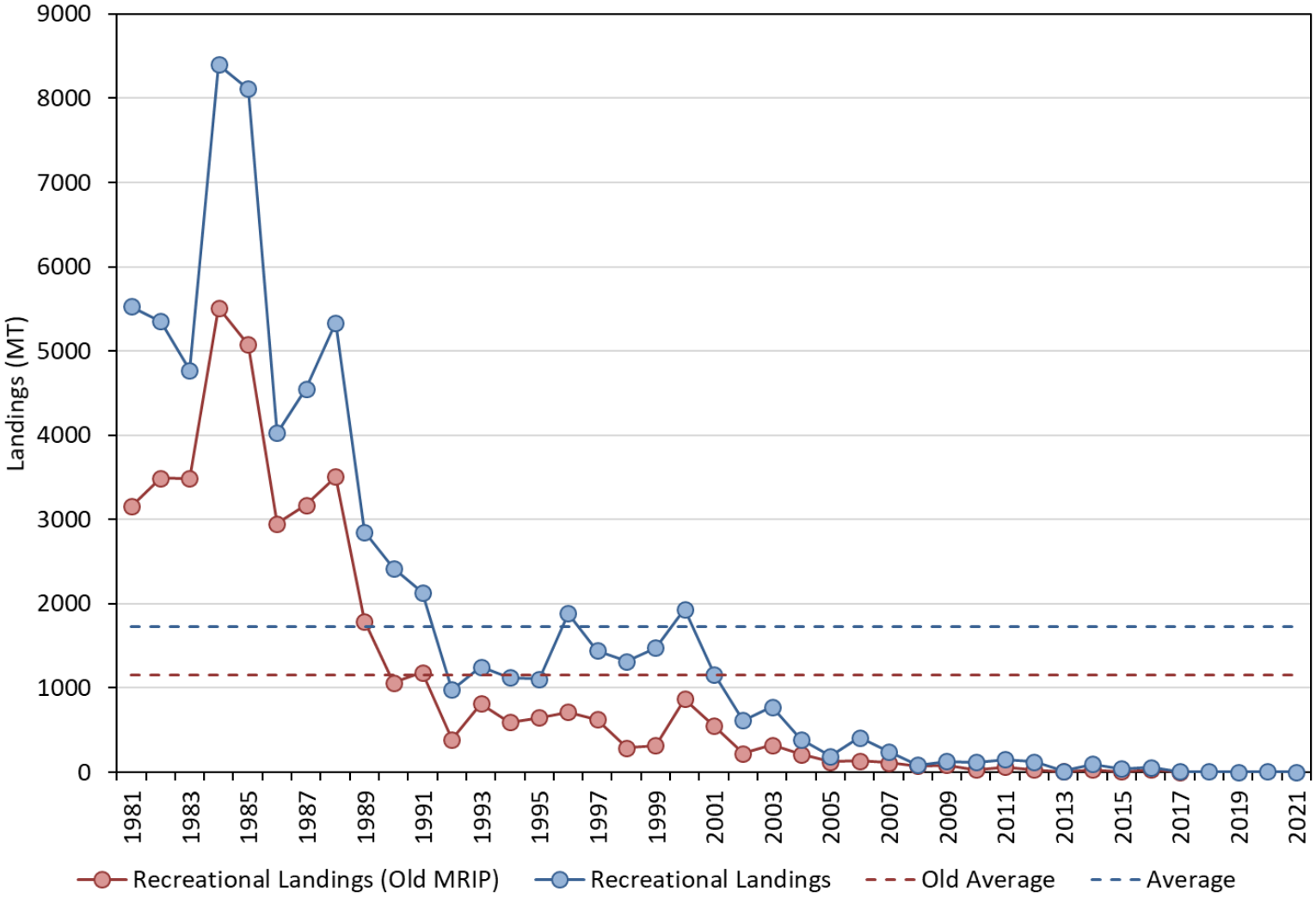
- 2020 and 2021 commercial landings from CAMS, 1981-2019 from AA
- 2020 landings were 120 MT and 2021 was 87 MT. time-series avg = 2,834 MT

SNEMA WFL Commercial Discards (50% mortality) 1981-2021



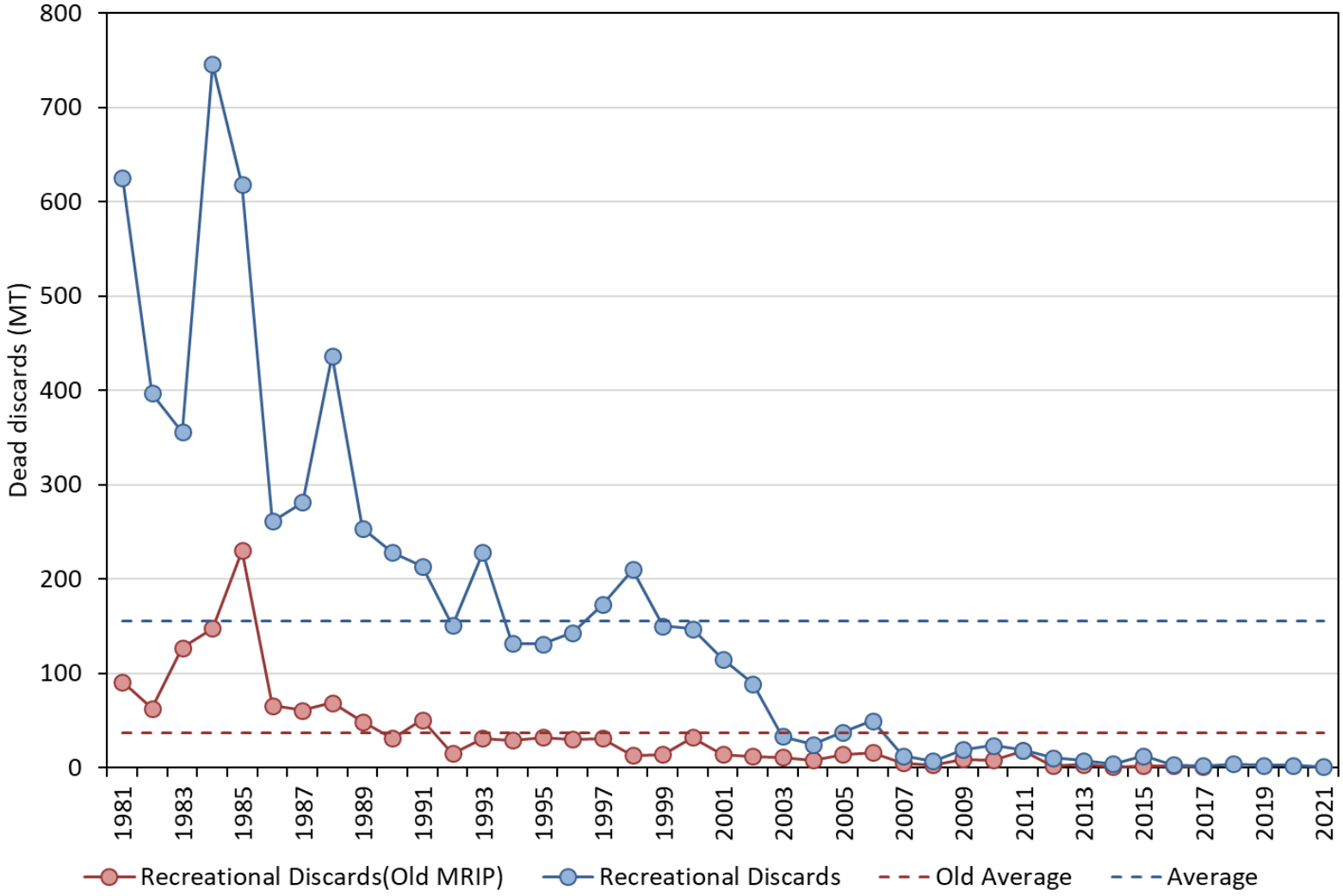
- Commercial discards from trawl (~63%) and scallop dredge (~37%) fisheries
- 2021 commercial discards were 122 MT, time-series average = 431 MT

SNEMA WFL Recreational Landings 1981-2021



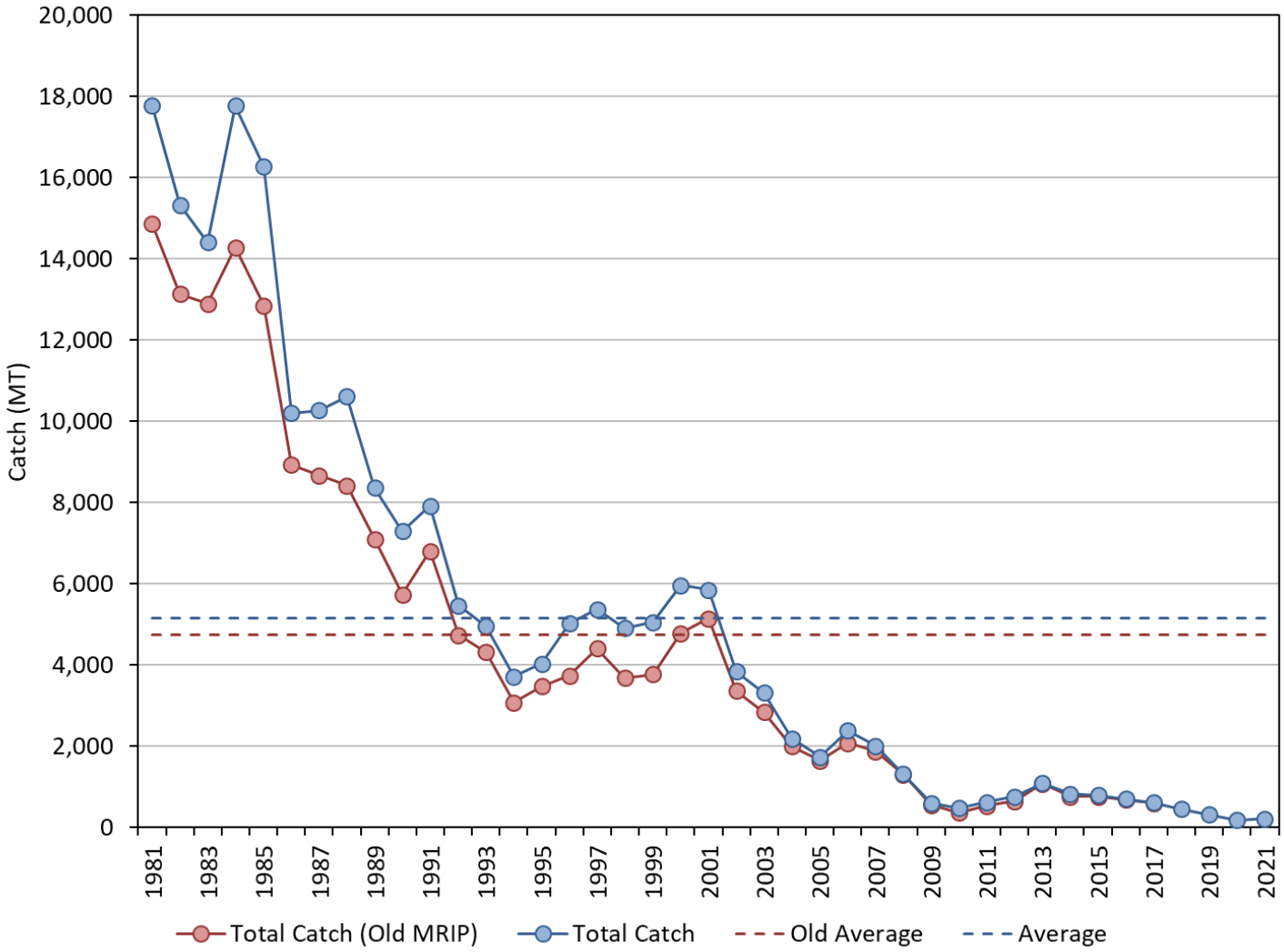
- 2019 recreational landings were 5.1 MT, time-series average = 1,811 MT (Old = 1,158 MT)

SNEMA WFL Recreational Discards 1981-2021



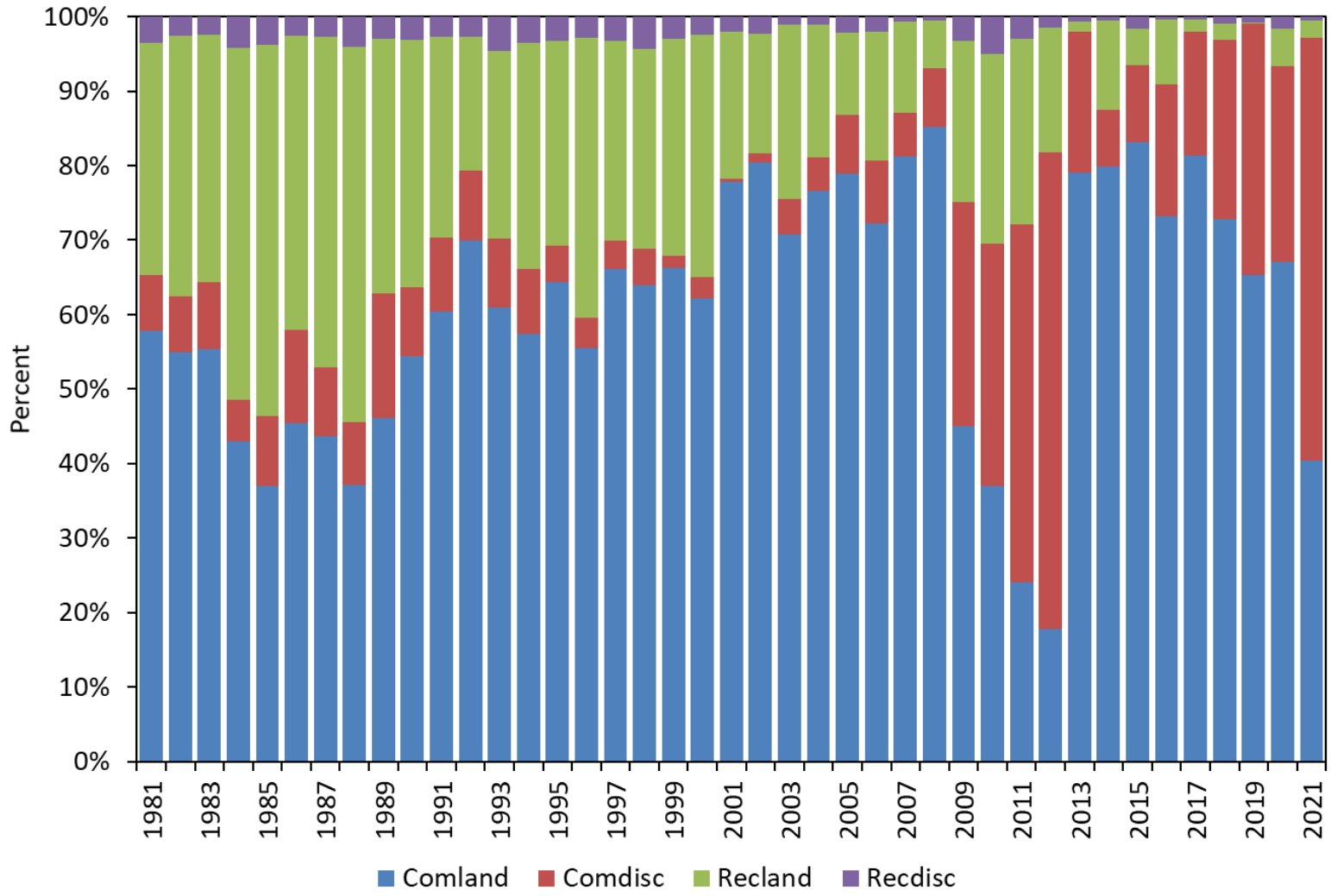
- 2021 recreational discards were 1.1 MT, time-series average = 163 MT (Old = 37 MT)

SNEMA WFL Total catch 1981-2021

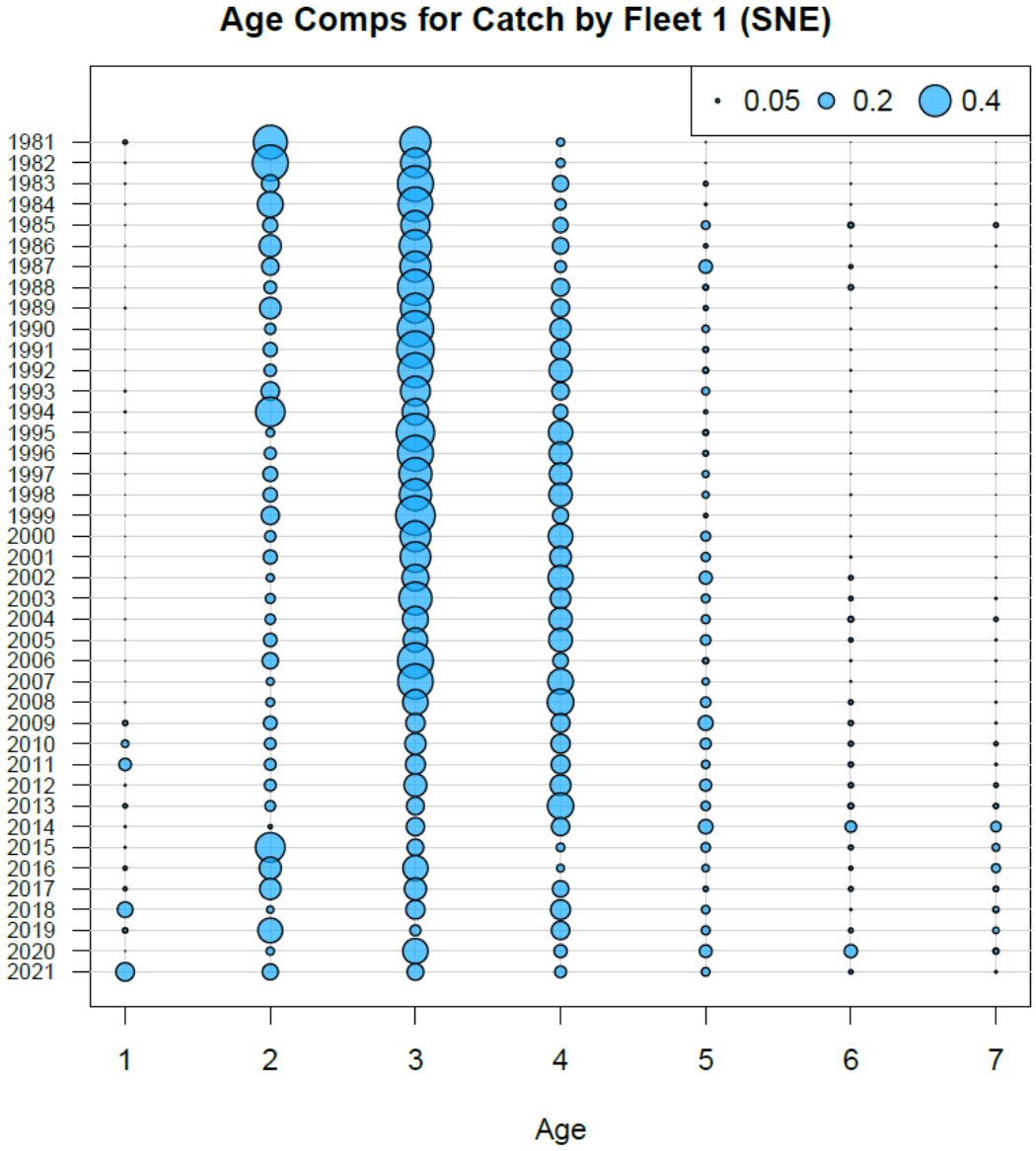


- 2021 Total catch was 216 MT, time-series average = 5,396 MT (Old = 4,750 MT)

SNEMA WFL Total catch components 1981-2021



SNEMA WFL Total Catch at Age

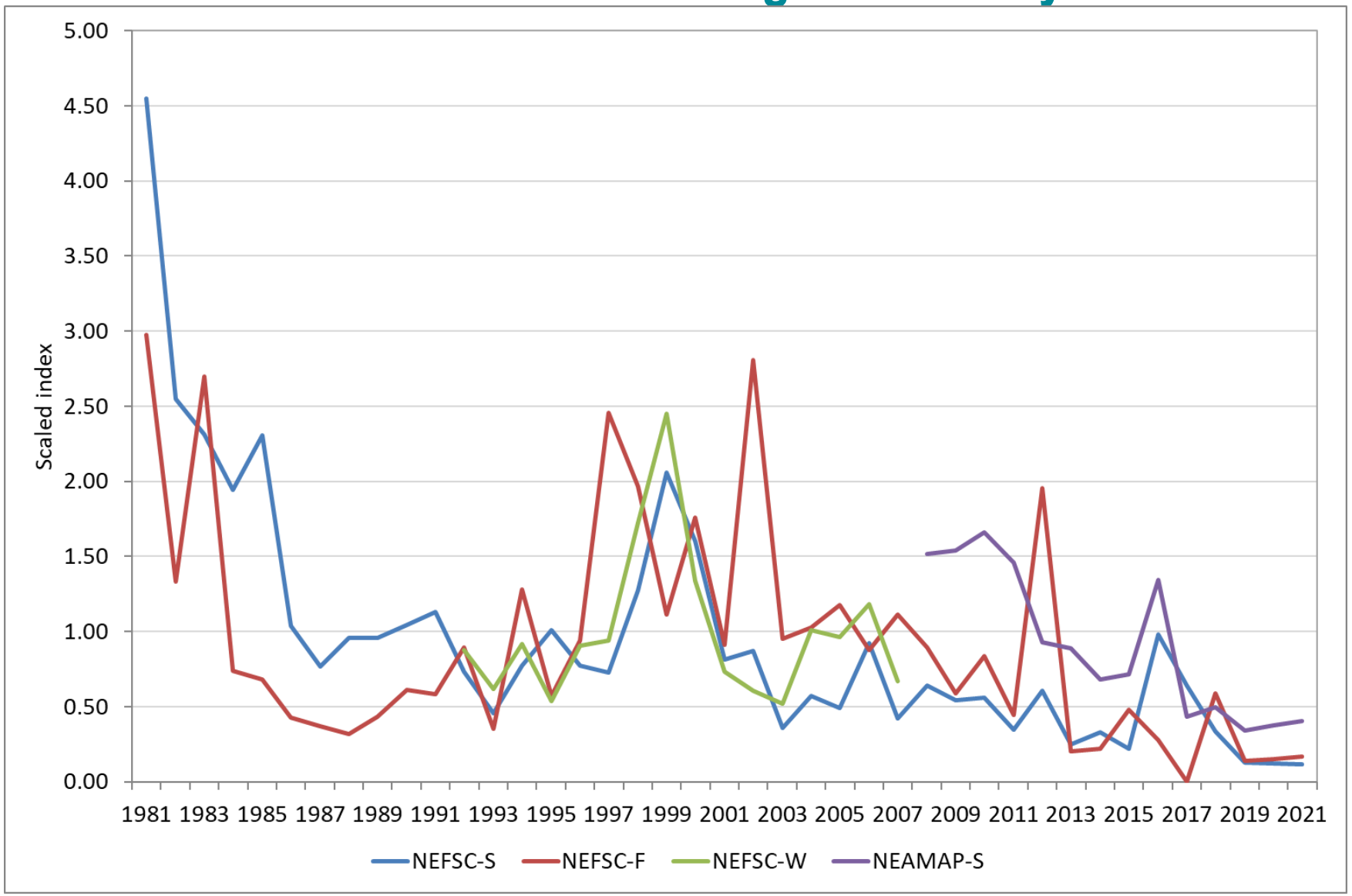


TOR 2: Evaluate indices used in the assessment

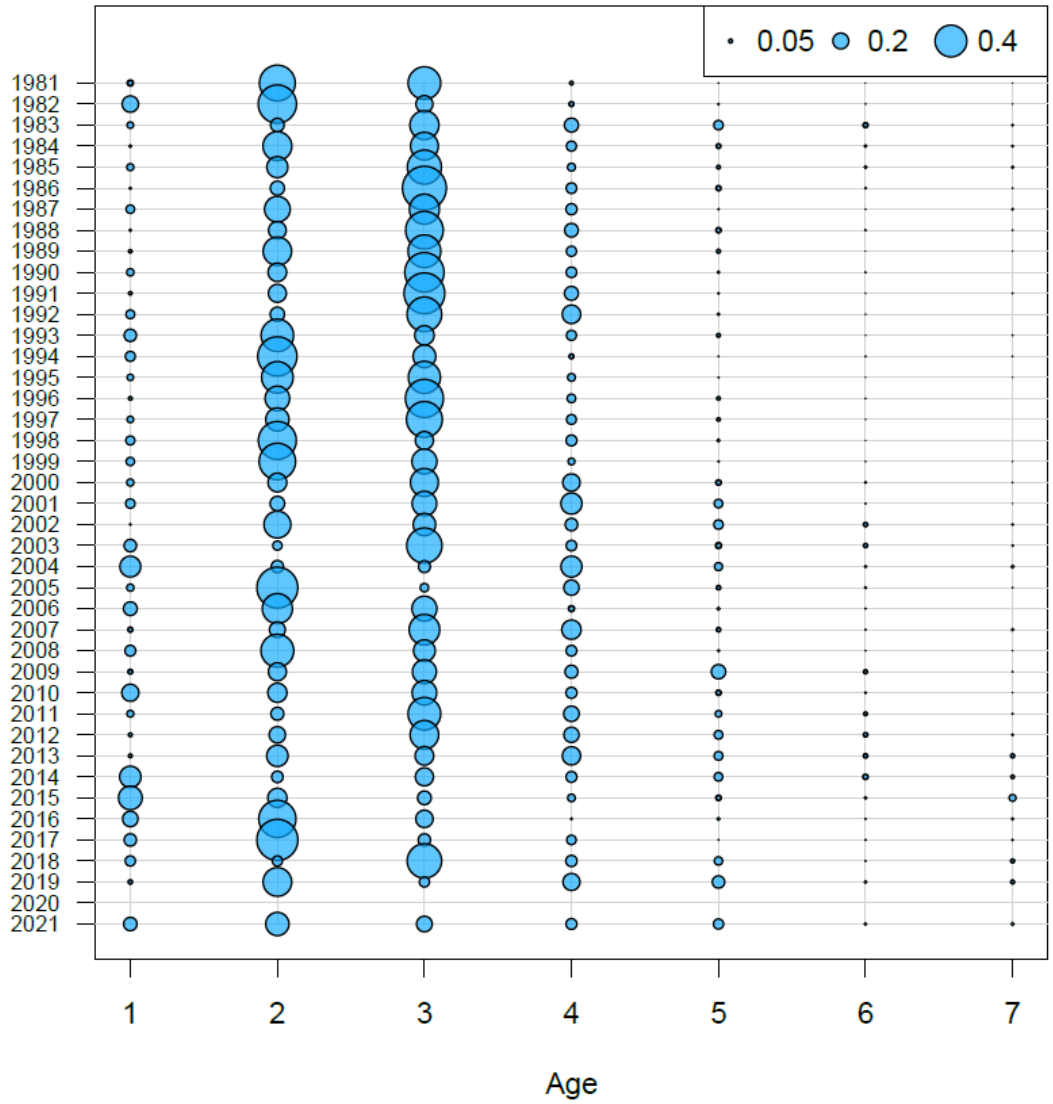
Fishery Independent: 1981-2021 ages 0-7+

- NEFSC winter, spring (no 2020), and fall (no 2017, 2020)
- NEAMAP spring (no 2020)
- MADMF spring (no 2020)
- RIDMF spring
- CTDEP spring (no 2020)
- NJDFW ocean and river (no survey since 2018)
- URIGSO
- Recruits: MADMF, CTDEP

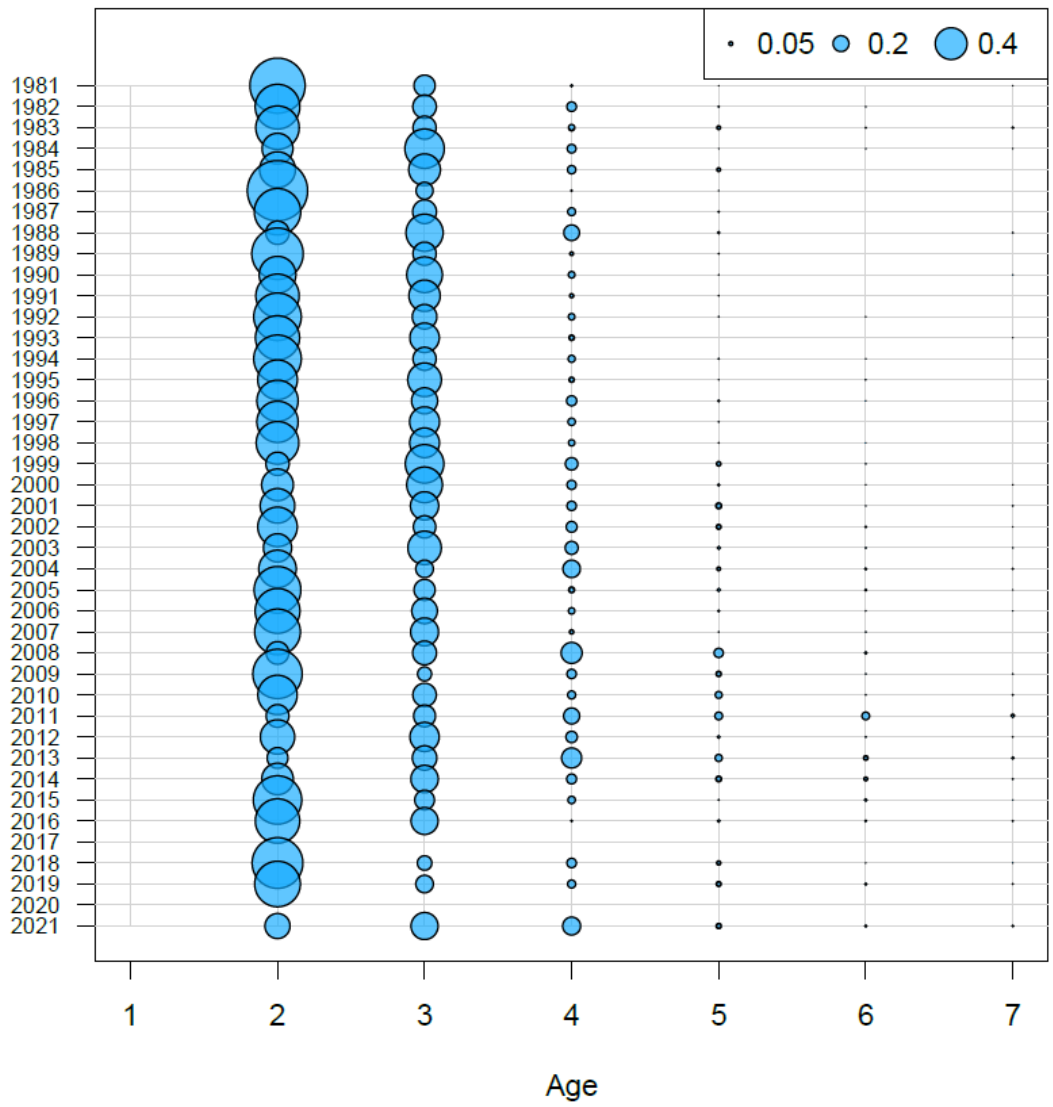
NEFSC BTS and NEAMAP regional survey indices



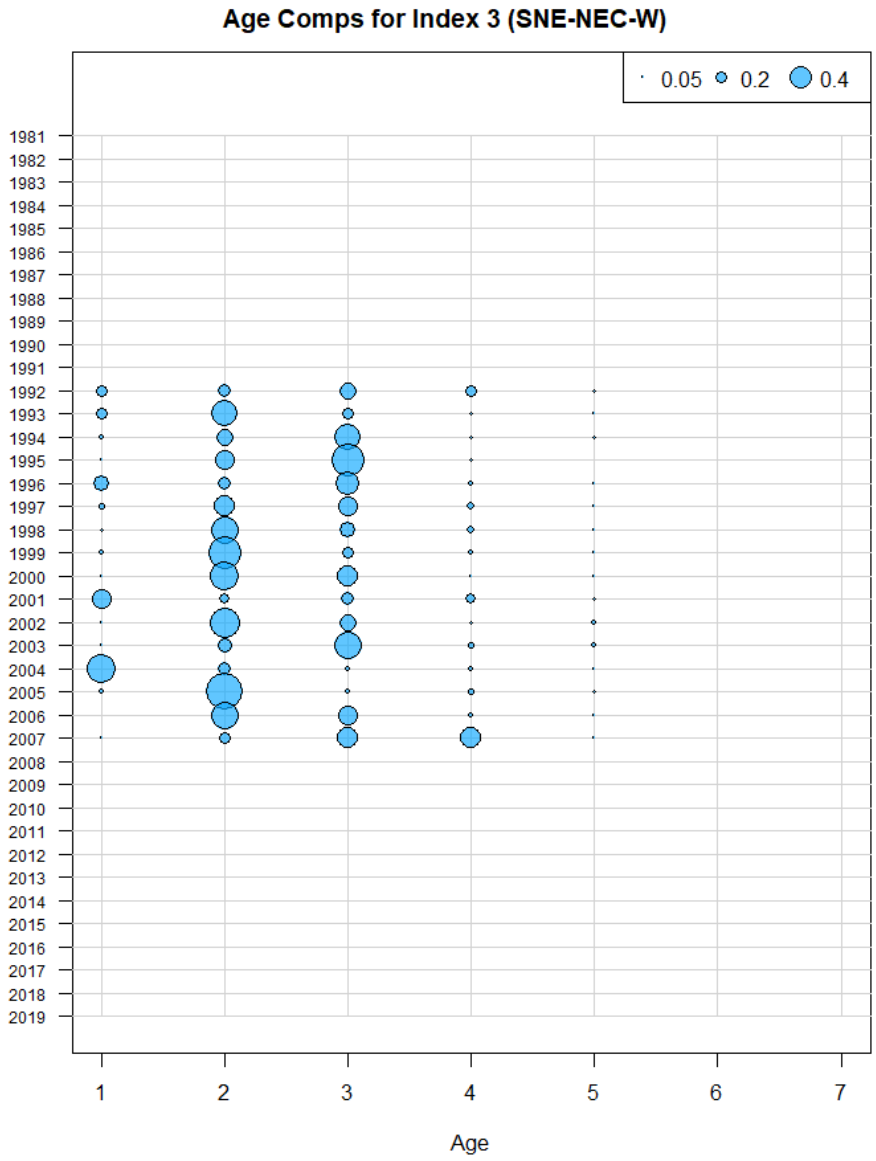
NEFSC S Age comp



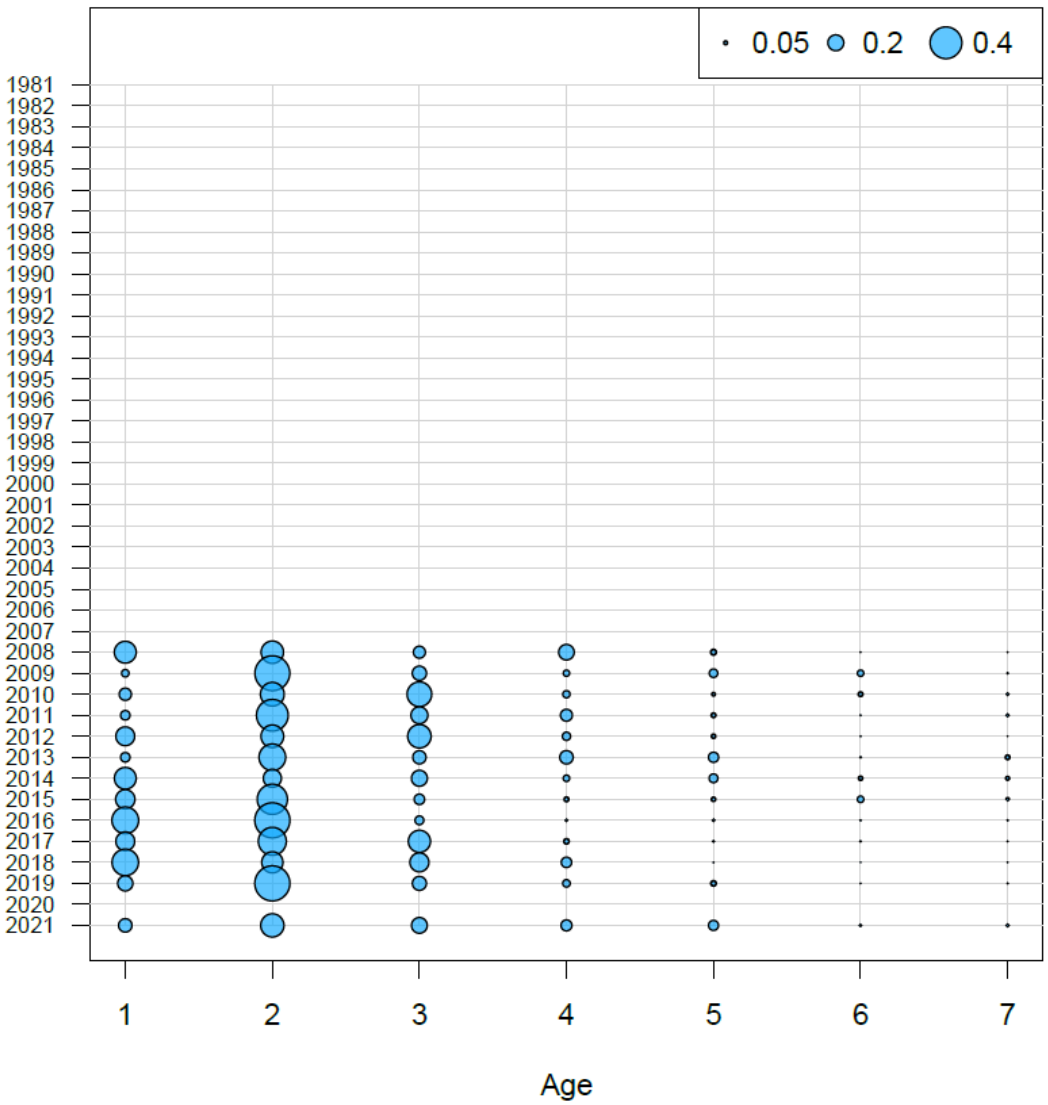
NEFSC F Age comp



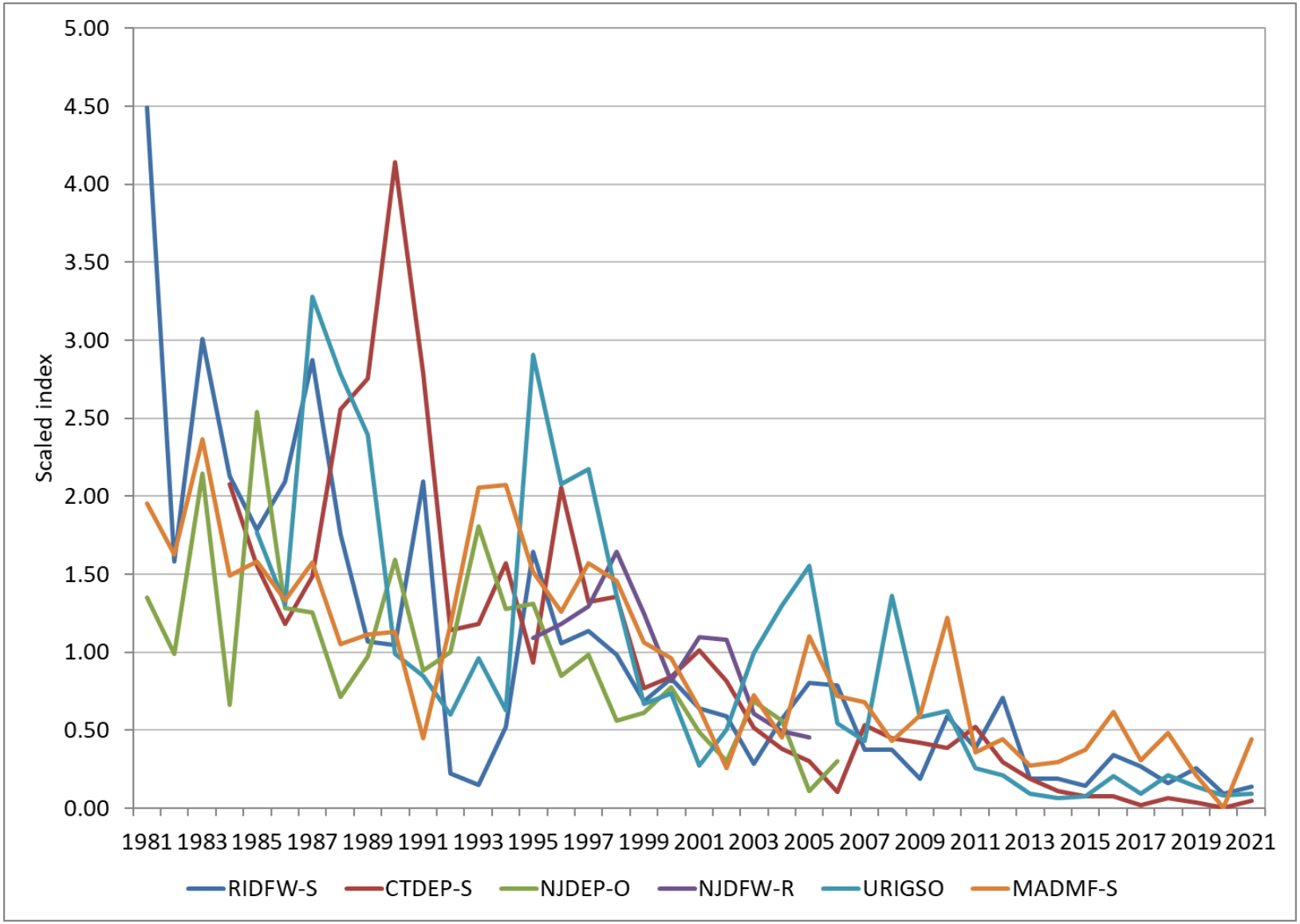
NEFSC W Age comp



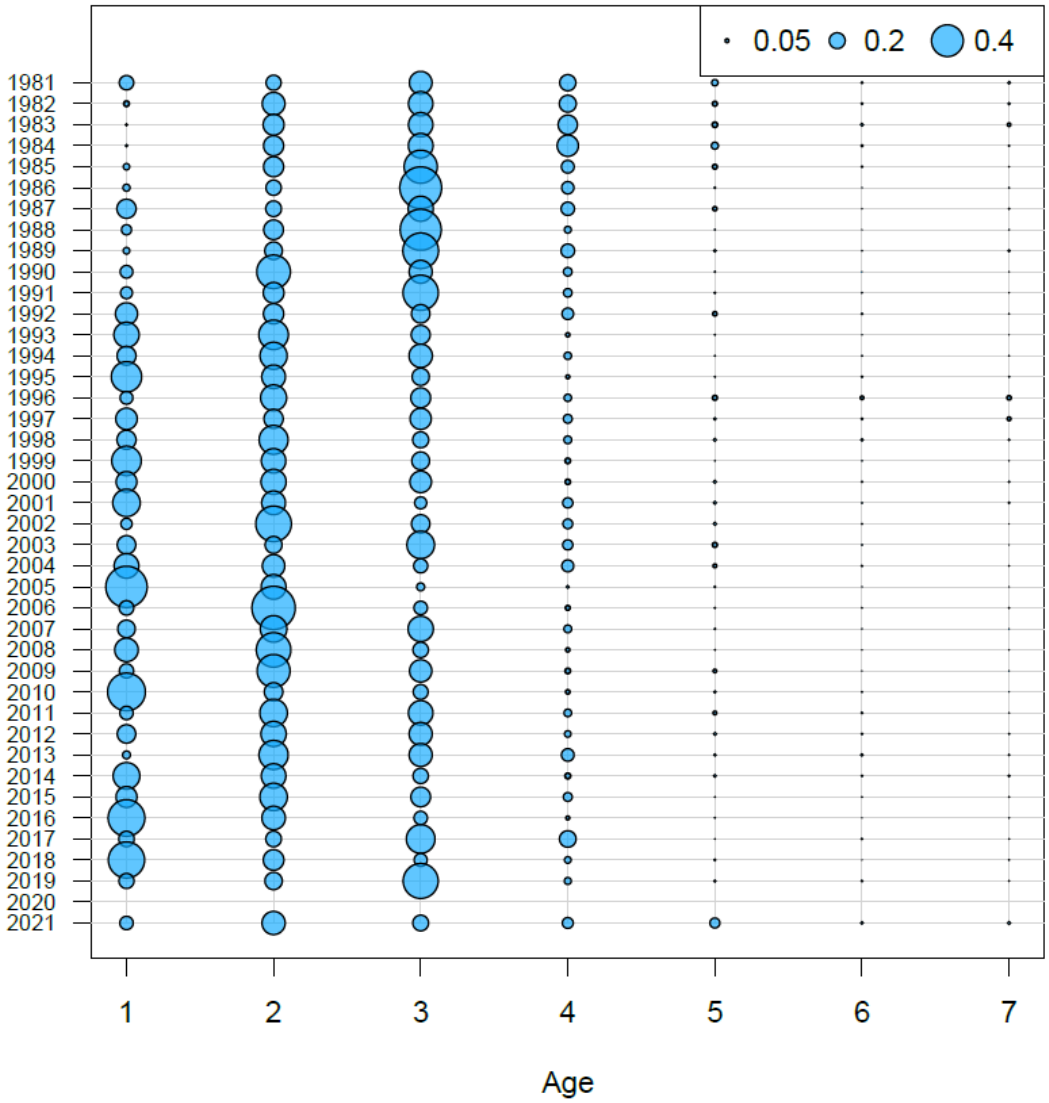
NEAMAP S Age comp



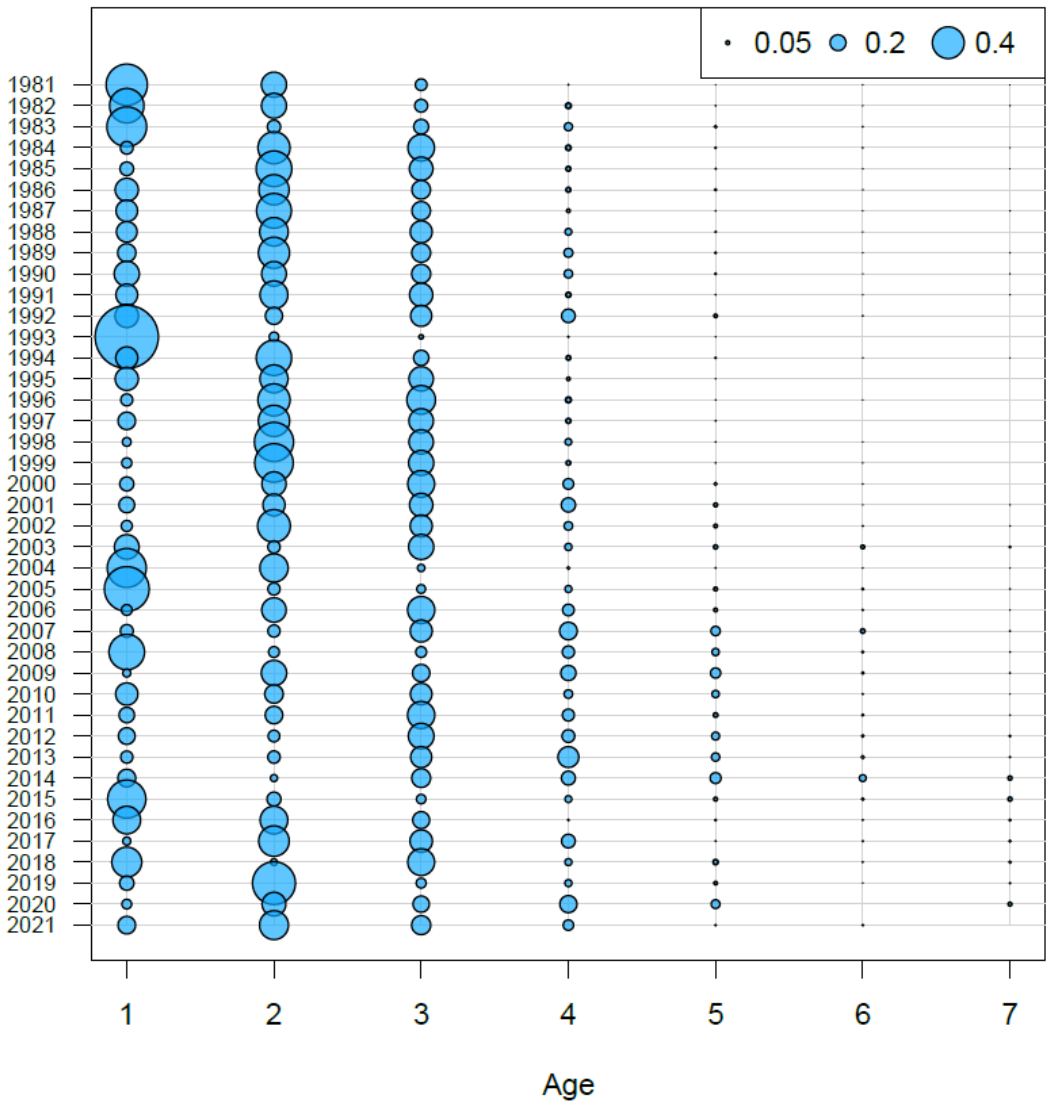
State survey indices



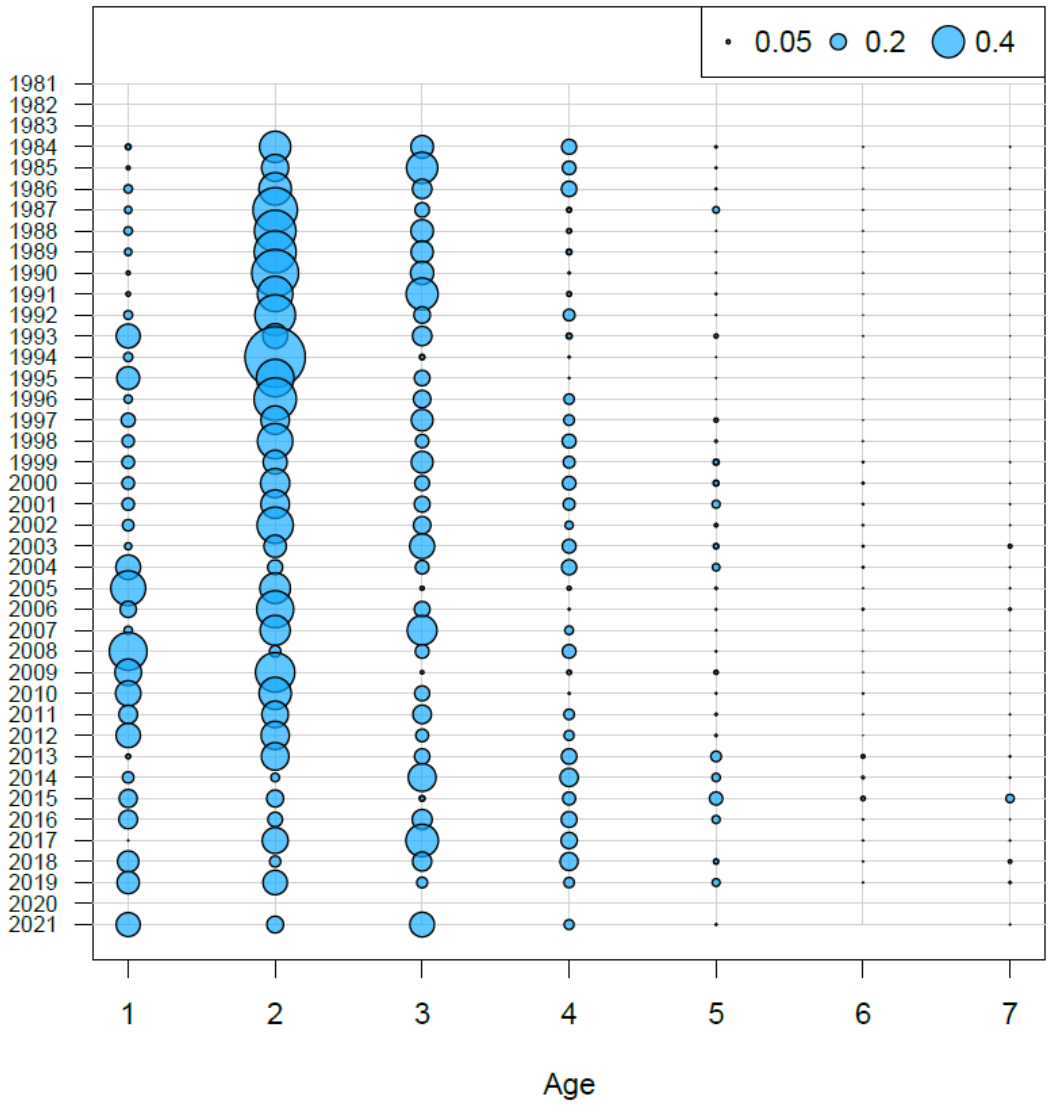
MADMF S Age comp



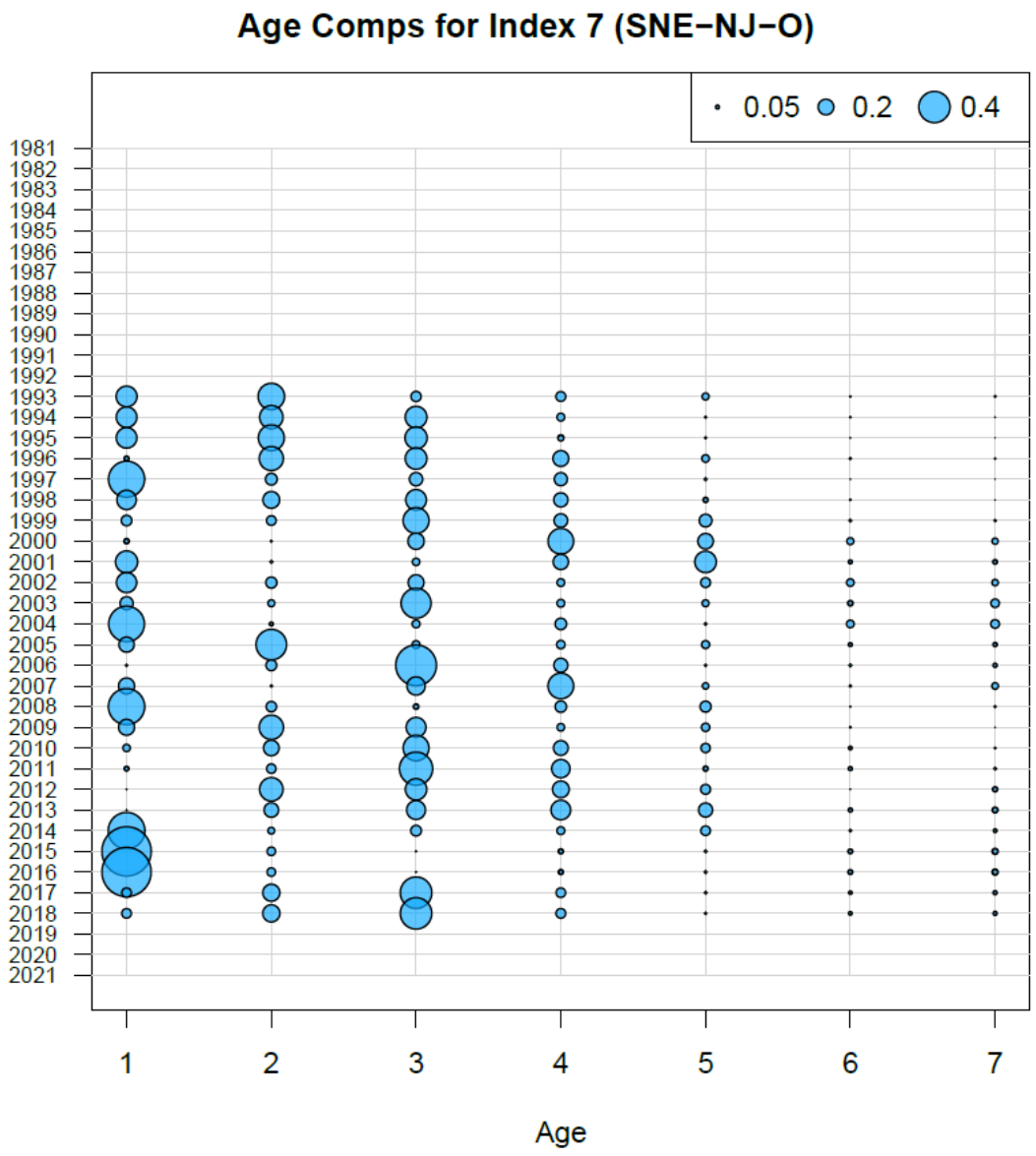
RIDFW S Age comp



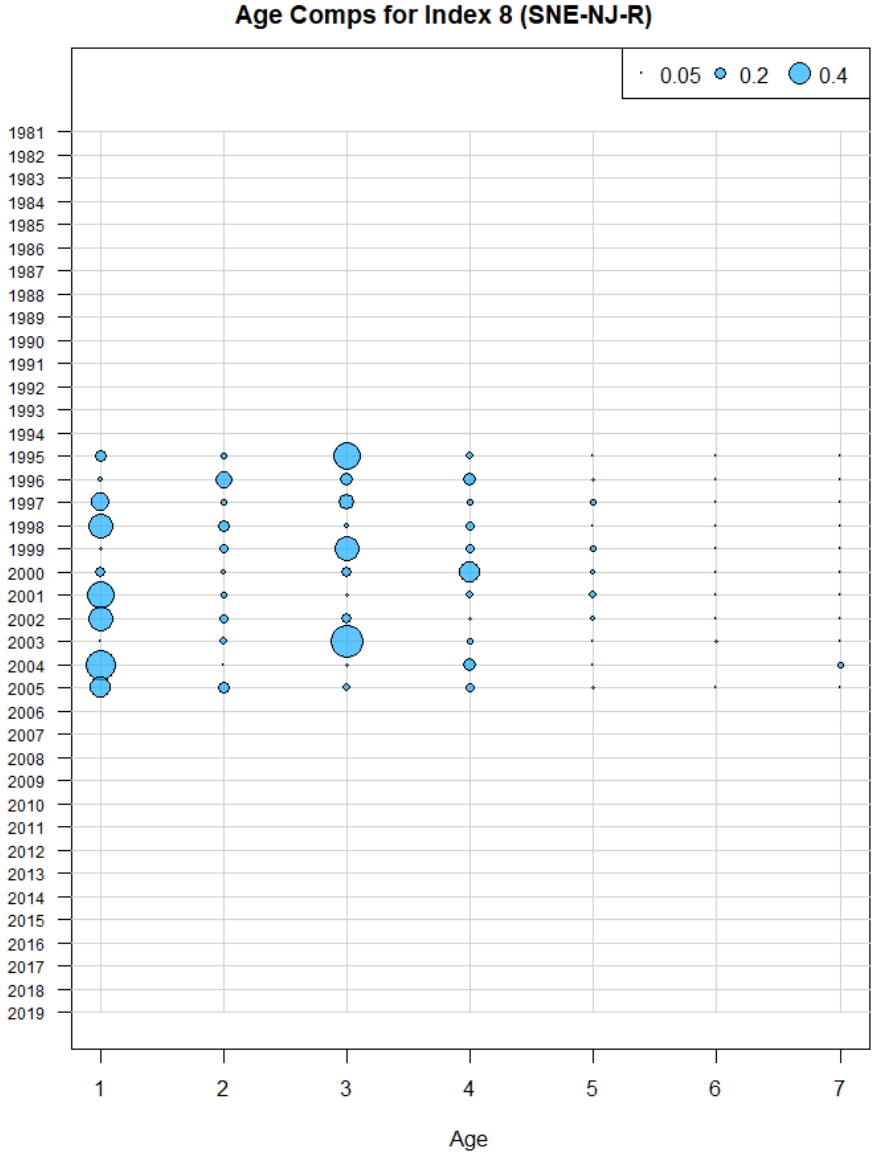
CTDEP S Age comp



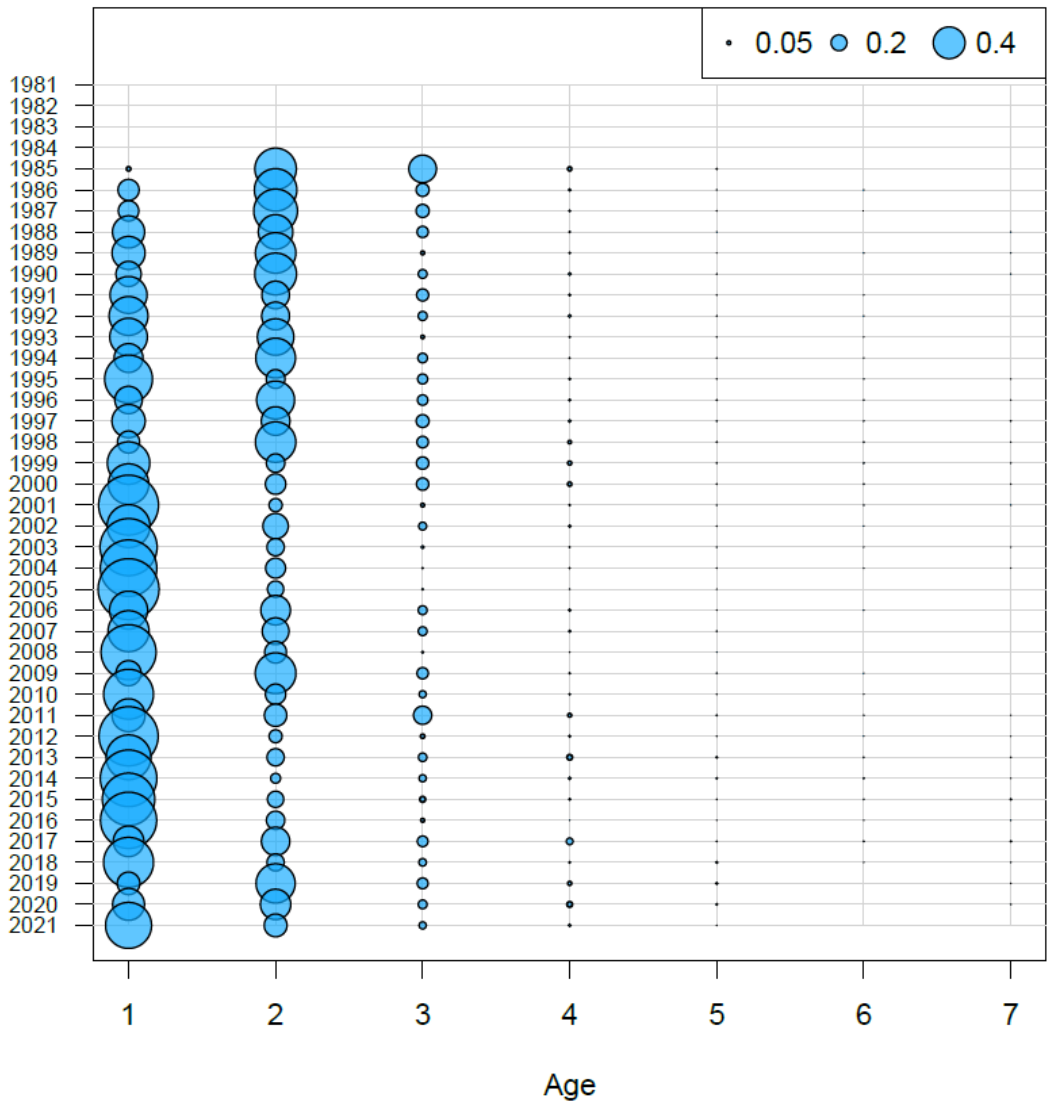
NJ Ocean Age comp



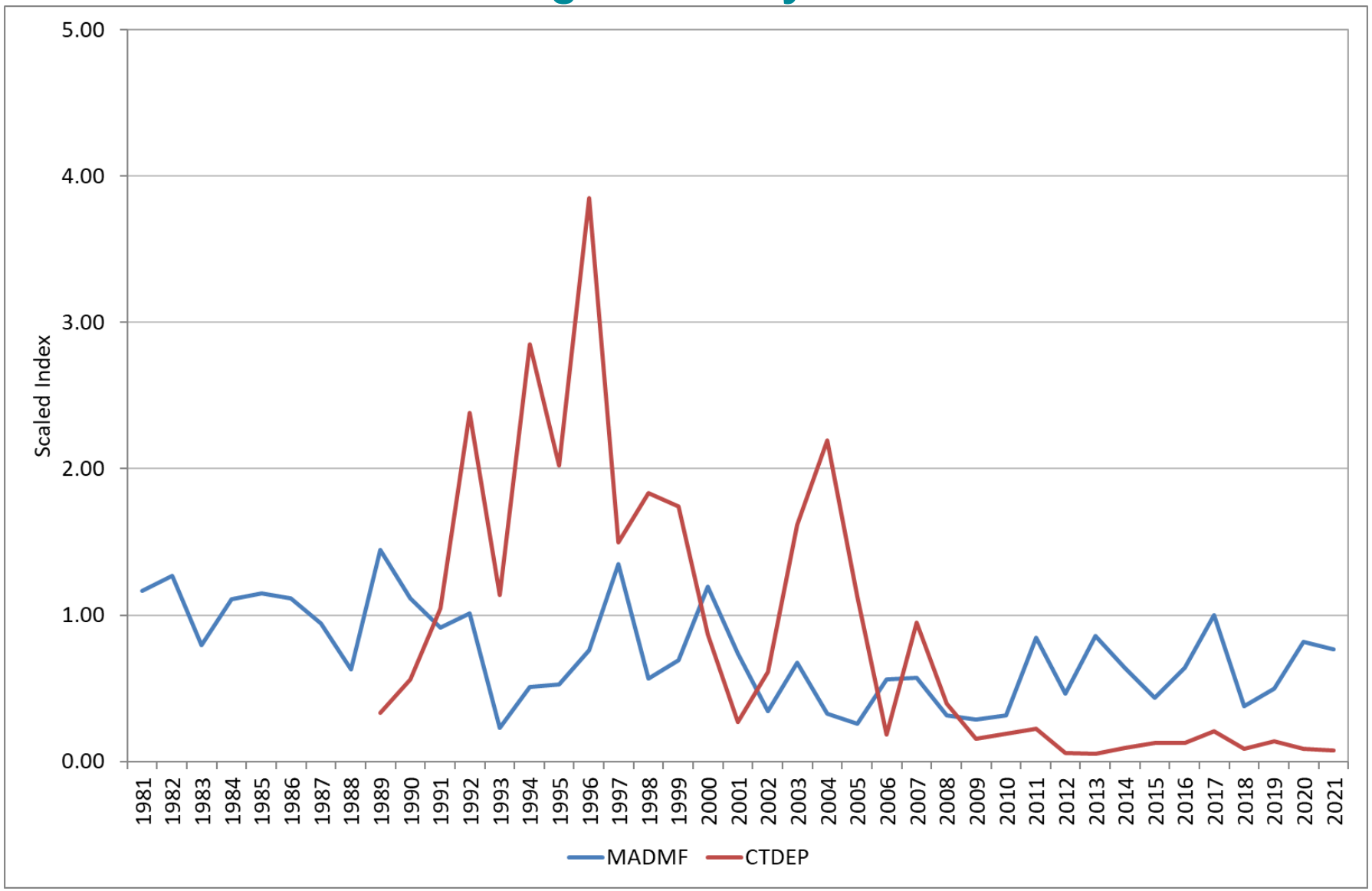
NJ River Age comp



URIGSO Age comp



State Age 0 survey indices



Biology

- M = 0.3
- Maturity: MADMF Spring survey data provide maturity information
  - Data from 1982-2008 used in SAW52
  - Age 1: 0%, Age 2: 8%, Age 3: 56%, Age 4: 95%

  Age 5+: 100%
- These input values were retained for the 2022 operational assessment

TOR 3: Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) as possible (depending on the assessment method) for the time series using the approved assessment method and estimate their uncertainty. Include retrospective analyses if possible (both historical and within-model) to allow a comparison with previous assessment results and projections, and to examine model fit.

a. Include bridge runs to sequentially document each change from the previously accepted model to the updated model proposed for this peer review.

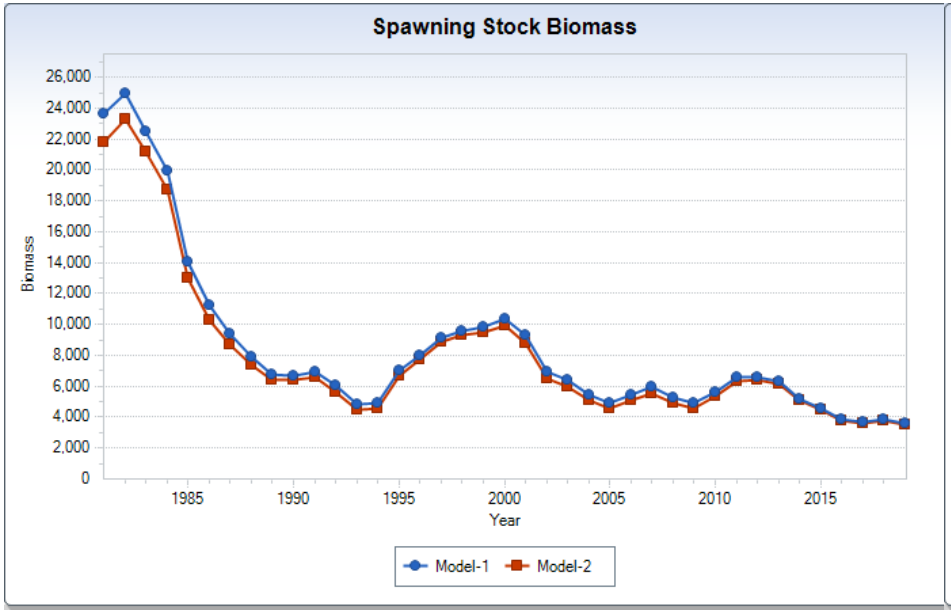
b. Prepare a "Plan B" assessment that would serve as an alternate approach to providing scientific advice to management if the analytical assessment were to not pass review

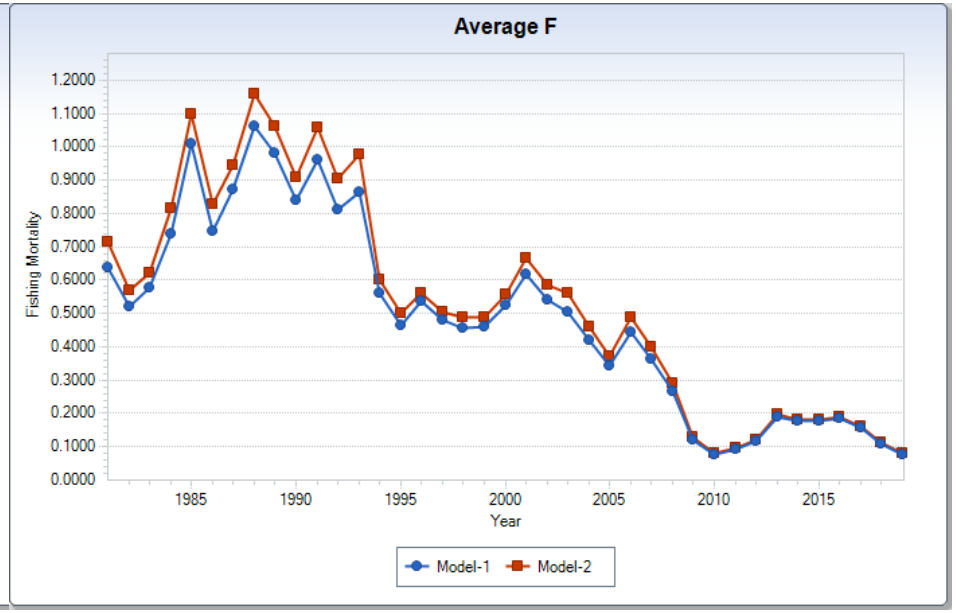
2020 Operational Model Configuration

- Single Fleet: Commercial and Recreational Landings and Discards
- Three selectivity blocks: 1981-1993, 1994-2009, 2010+ SAA, forced flat at ages 4+
- 12 survey indices (10 Age 1-7, 2 YoY)
- Penalty on Nyear1

Model Bridge

1. Base Run (Model 1) = 2020 OA model
2. Un-bump NEFSC Fall index to age 1-7+ (Model 2)
3. Update data through 2021

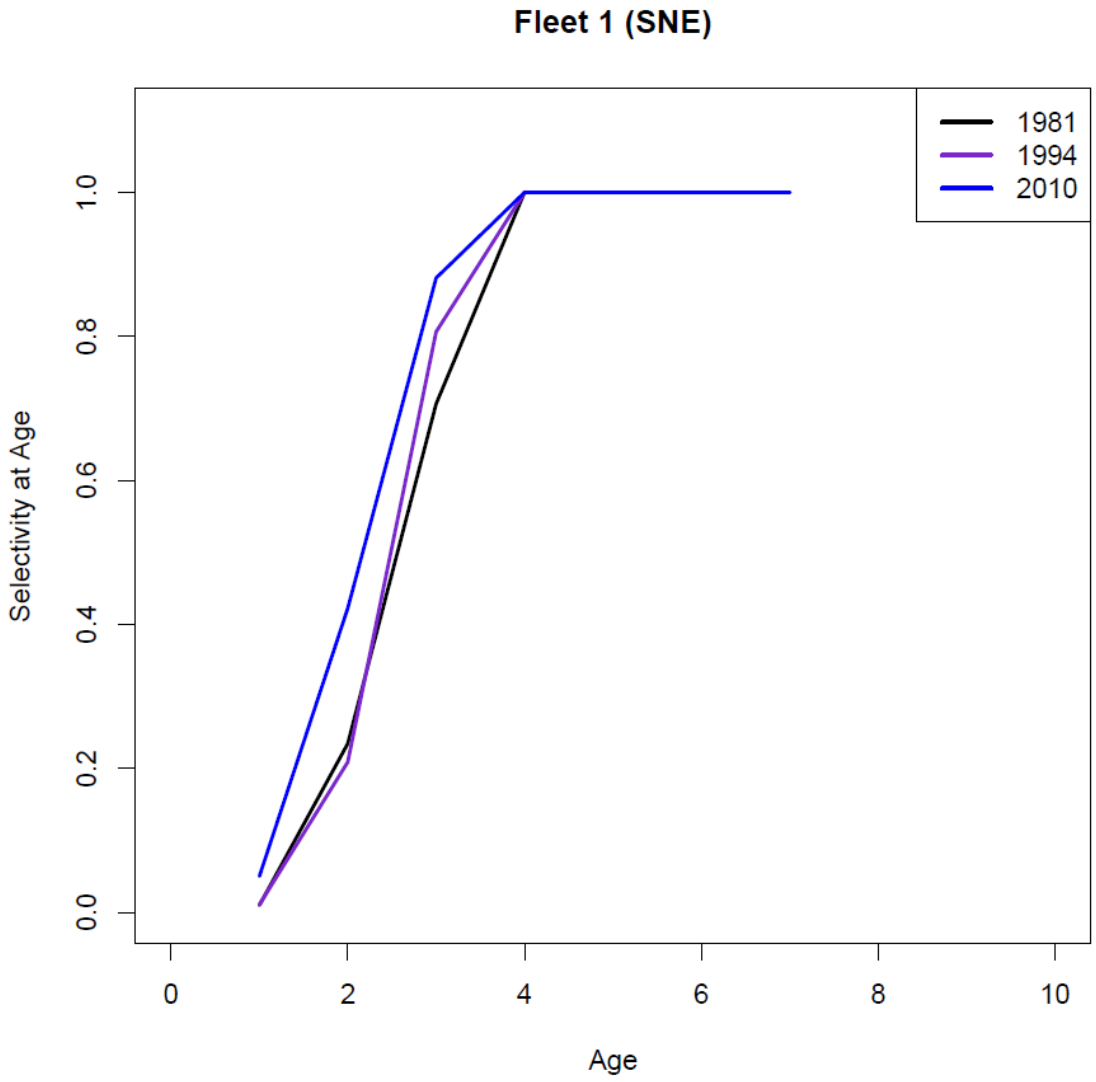




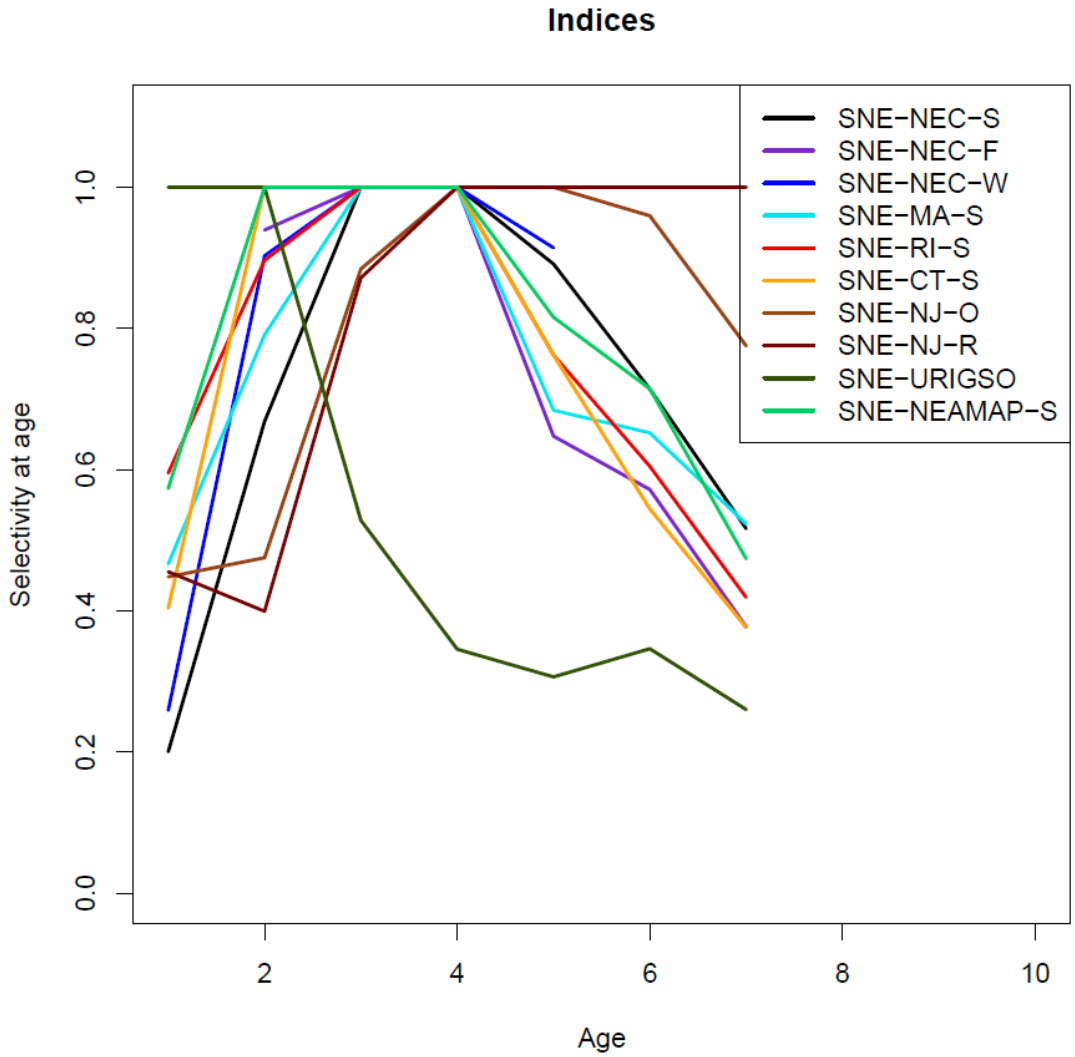
2022 Final Model Configuration

- Single Fleet: Commercial and Recreational Landings and Discards
- Three selectivity blocks: 1981-1993, 1994-2009, 2010+
  - Flat top selectivity
- 12 survey indices (10 Age 1-7, 2 YoY)
- Penalties on Nyear1

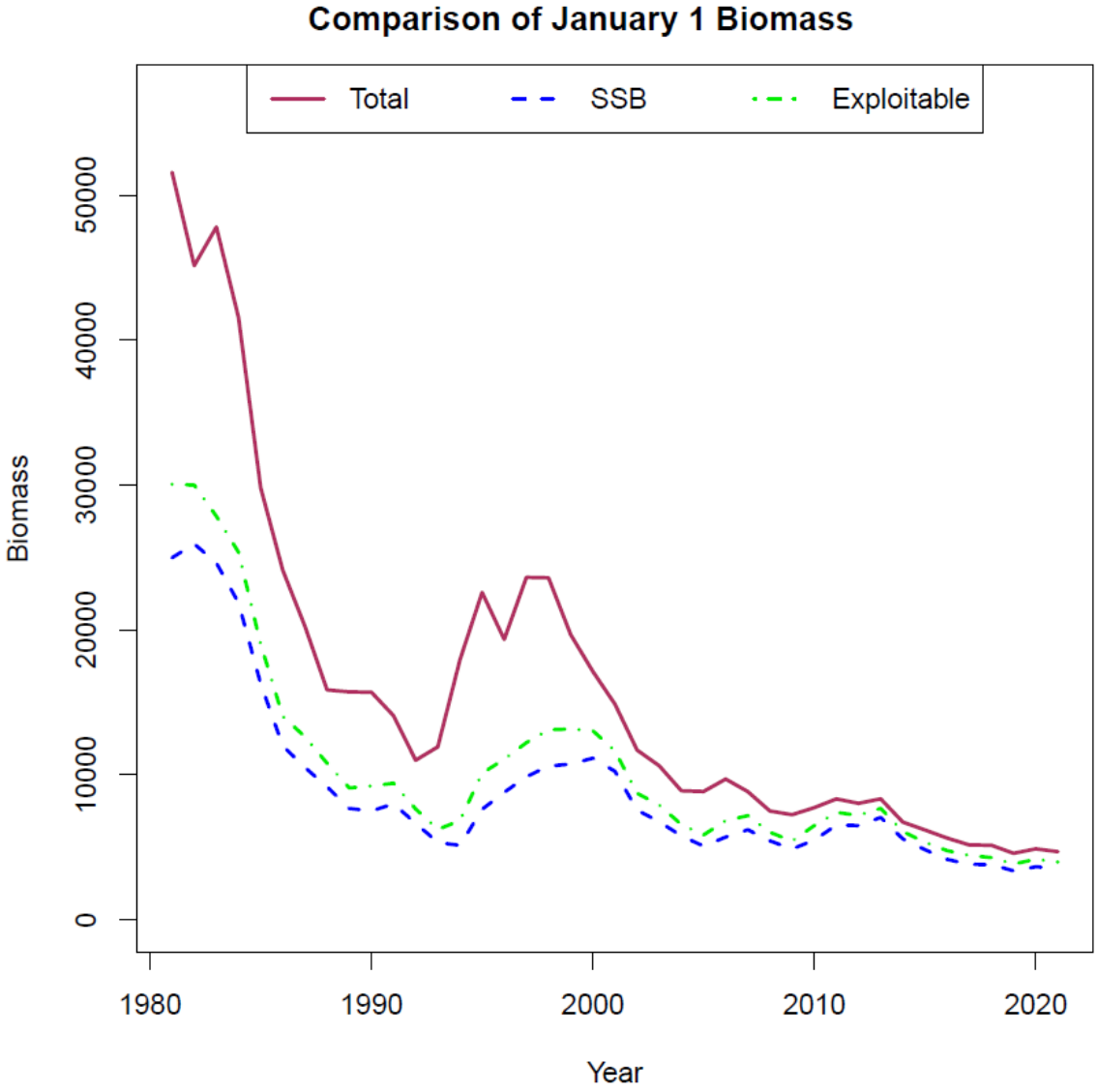
Results: Fleet Selectivity



Results: Survey Selectivity



Results: Biomass



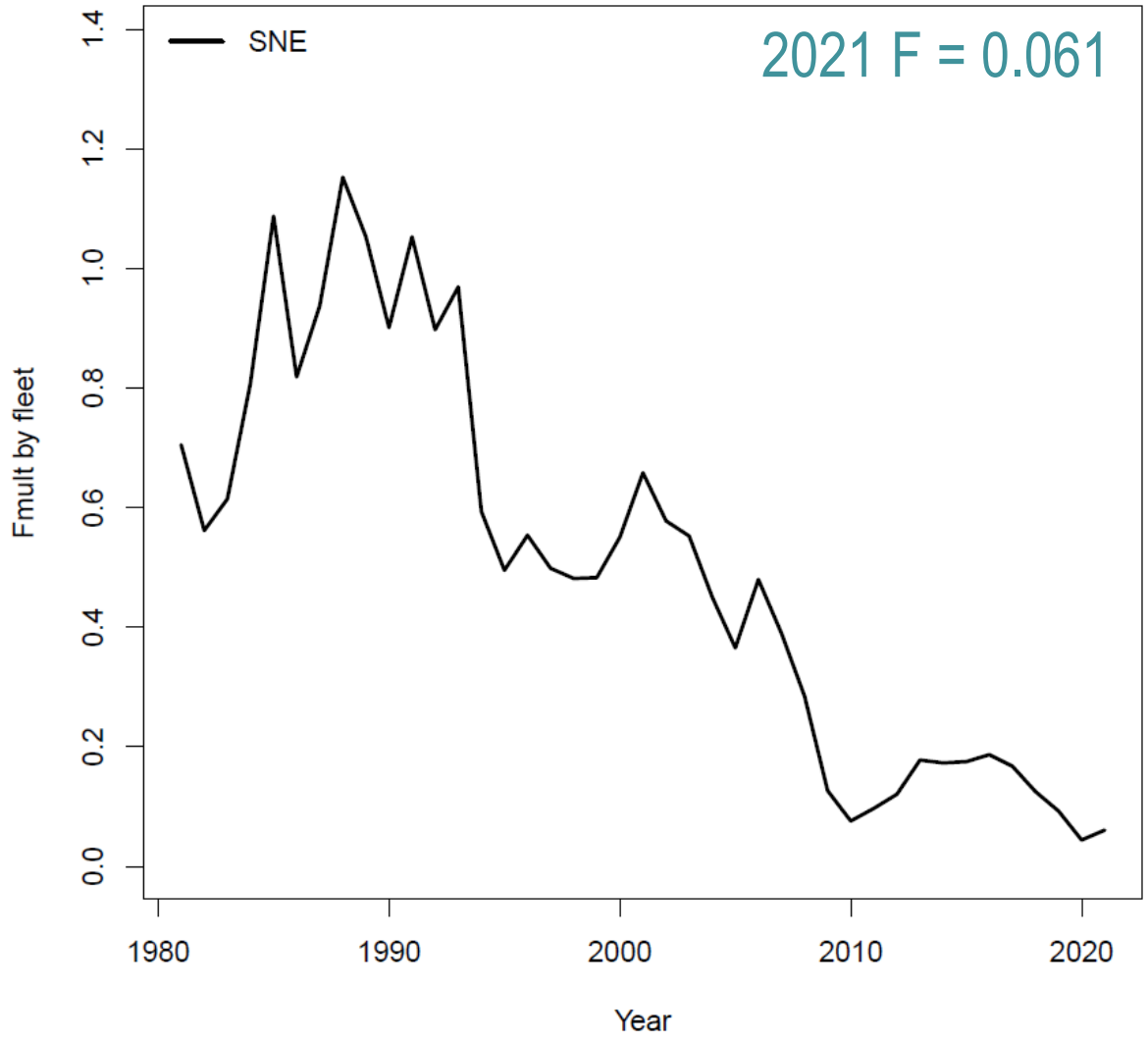
2021 Biomass Estimates

Total = 4,689 MT

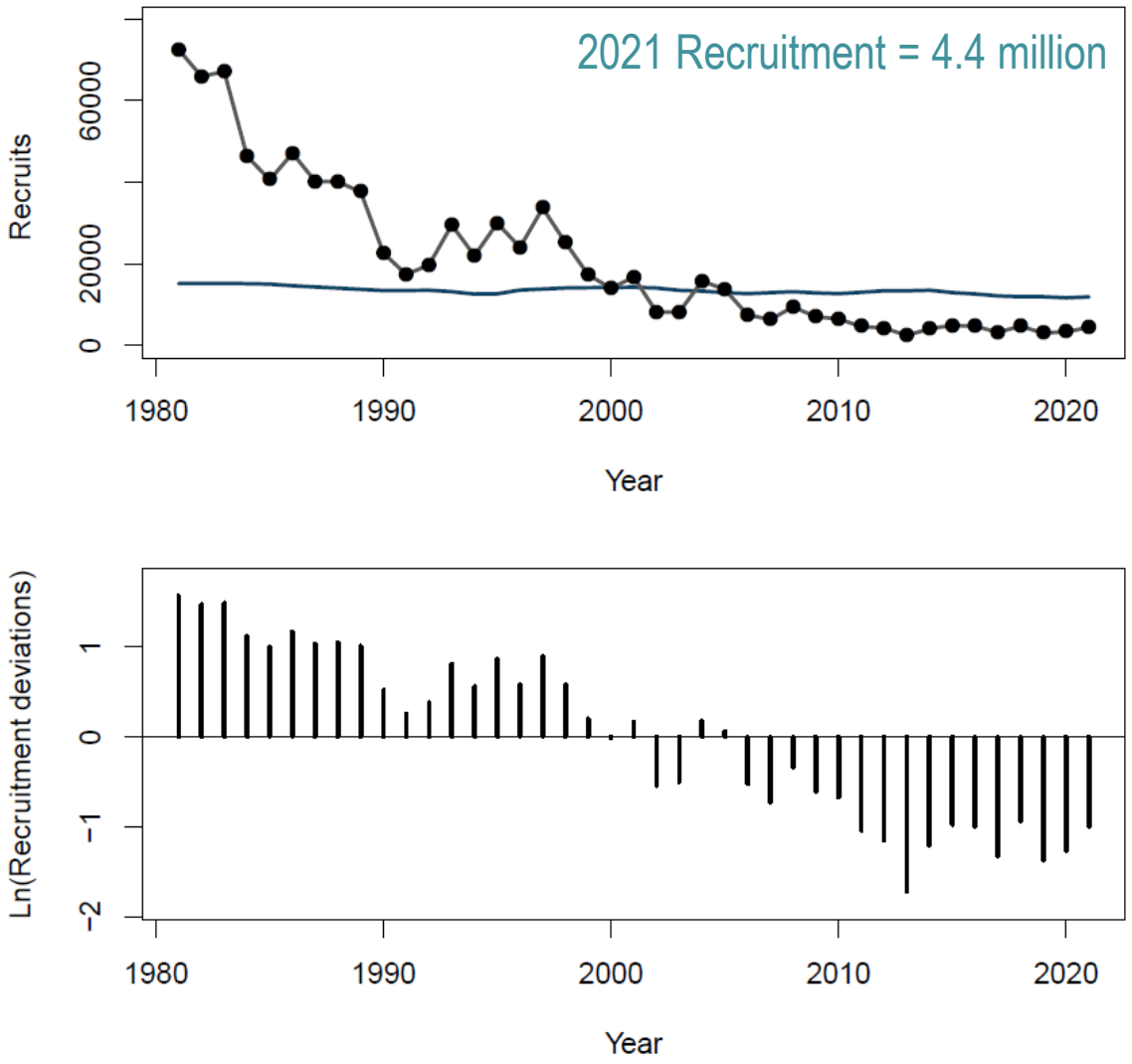
SSB = 3,353 MT

Exploitable = 4,252 MT

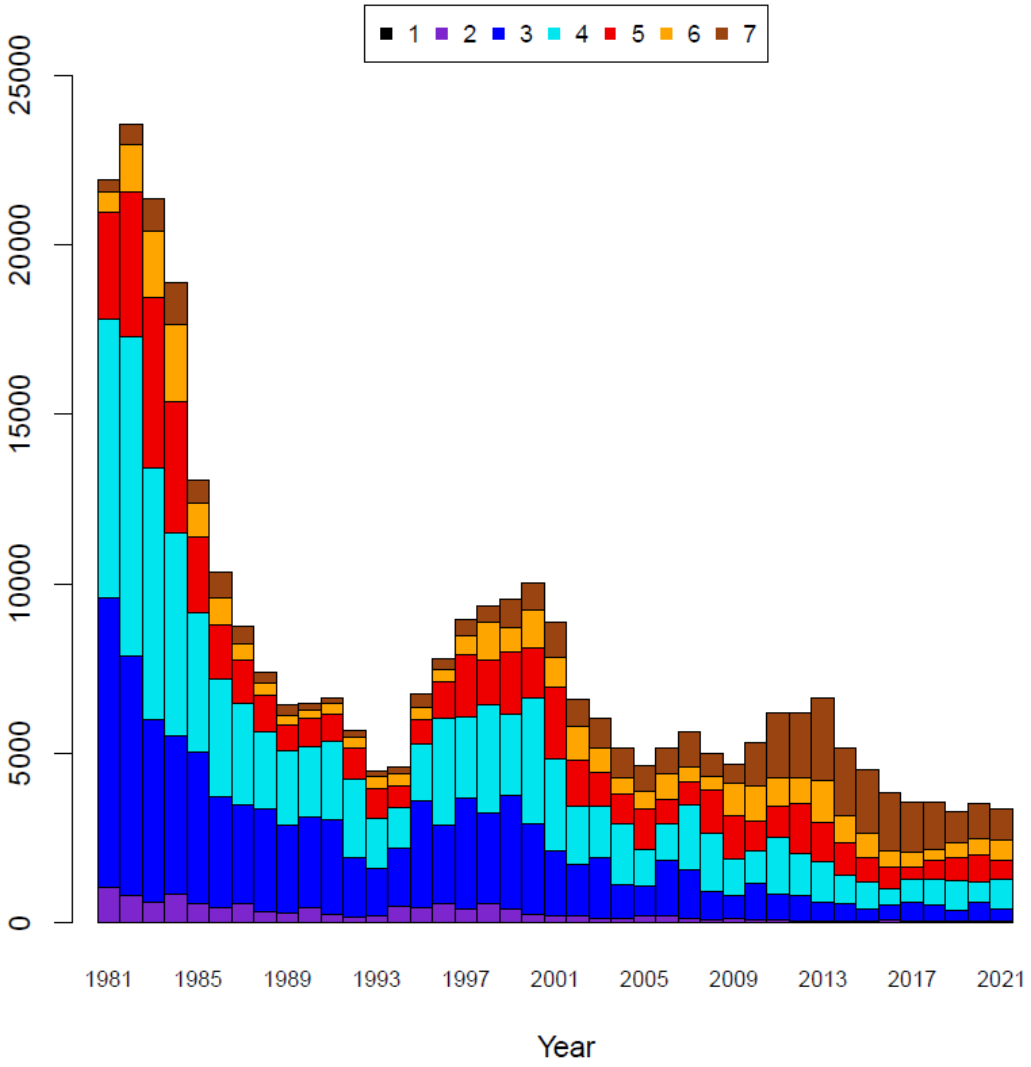
Results: Fmult



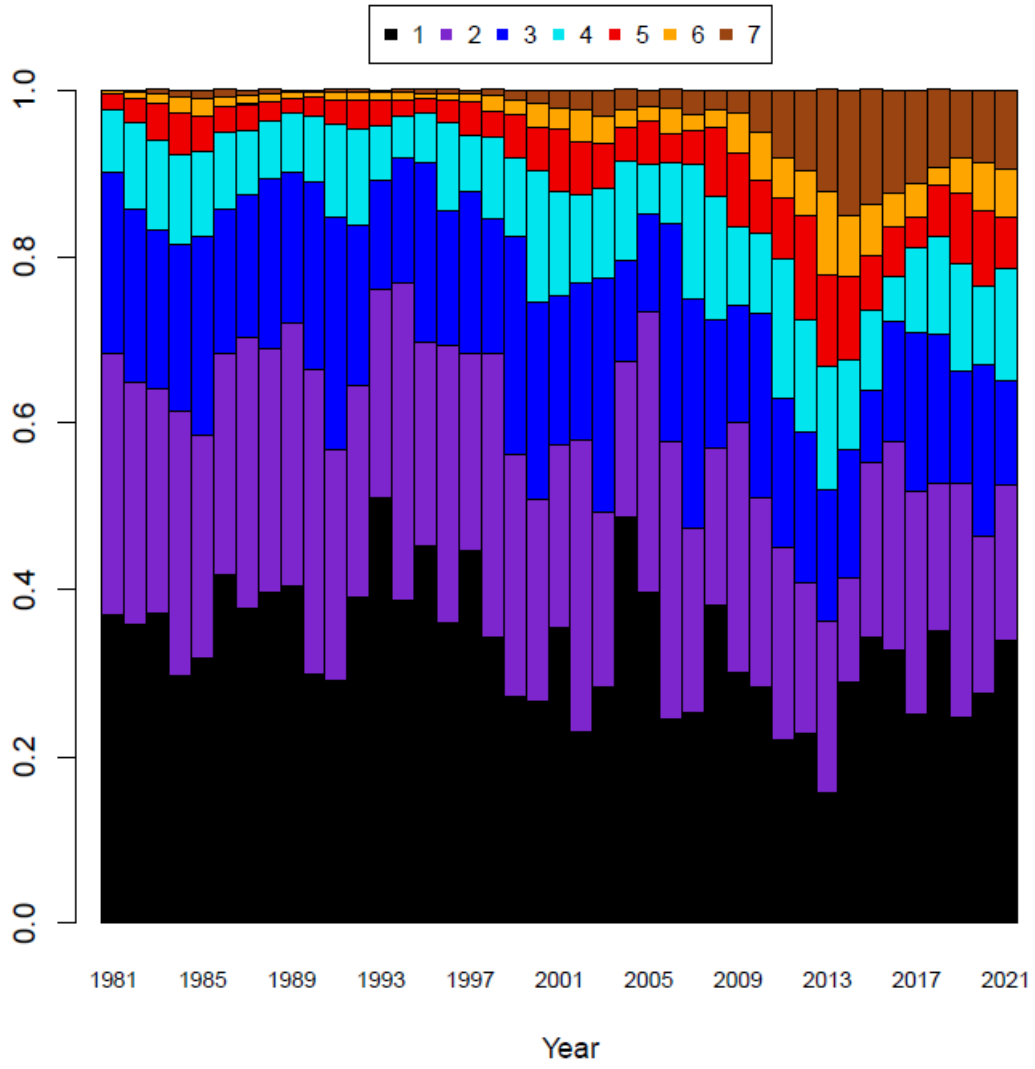
Results: Recruitment



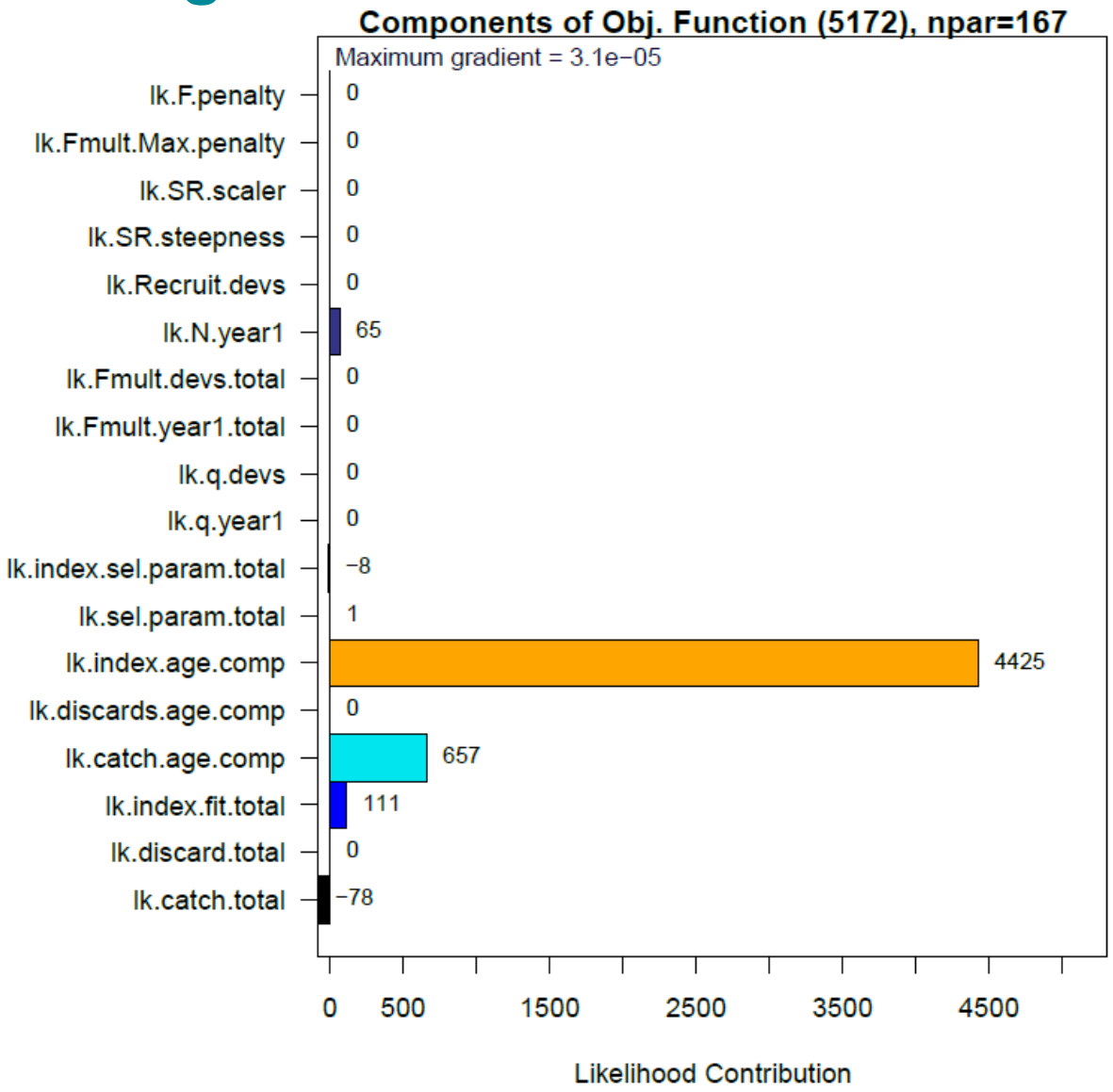
Results: SSB at age



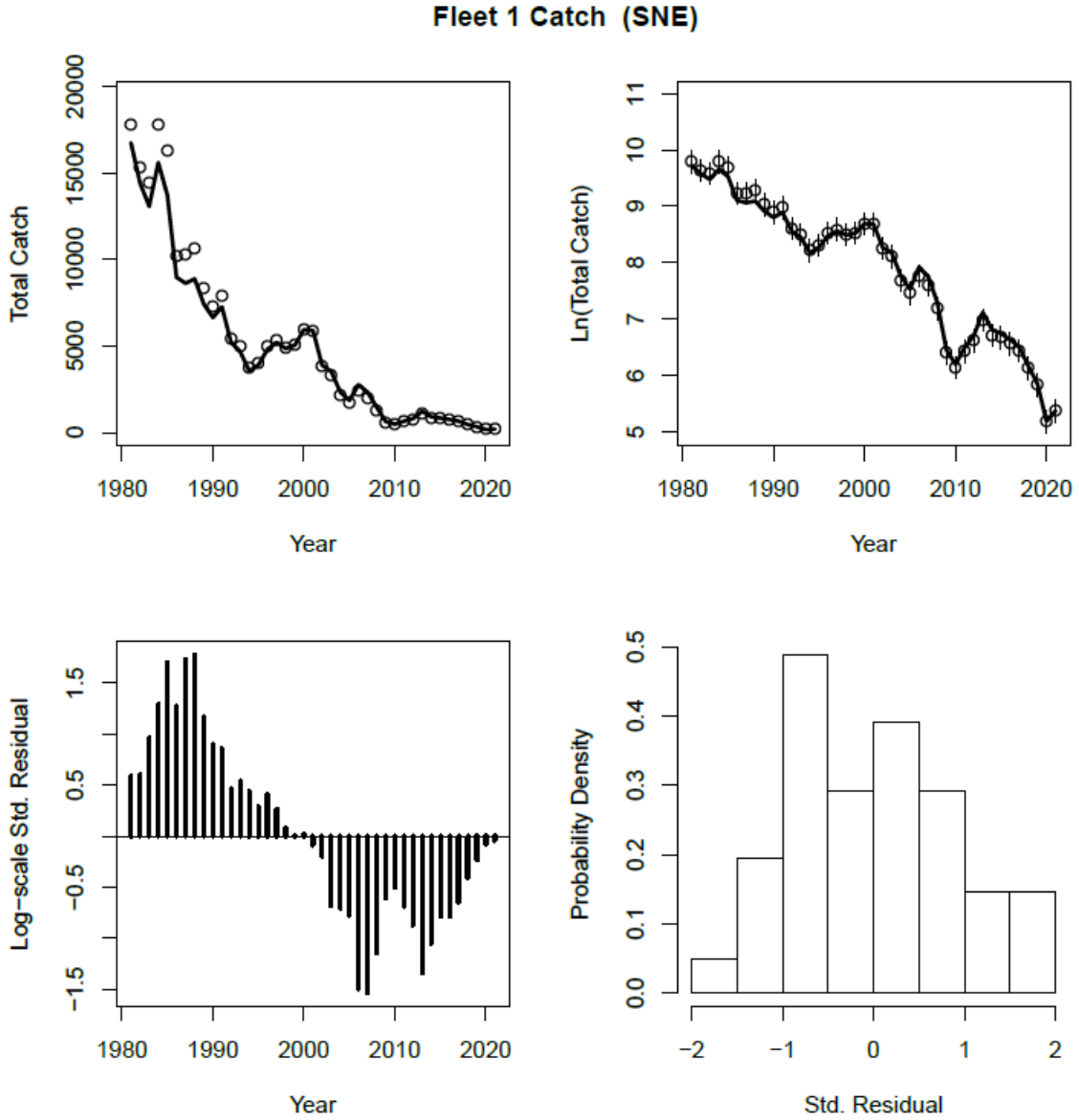
Results: Numbers at age



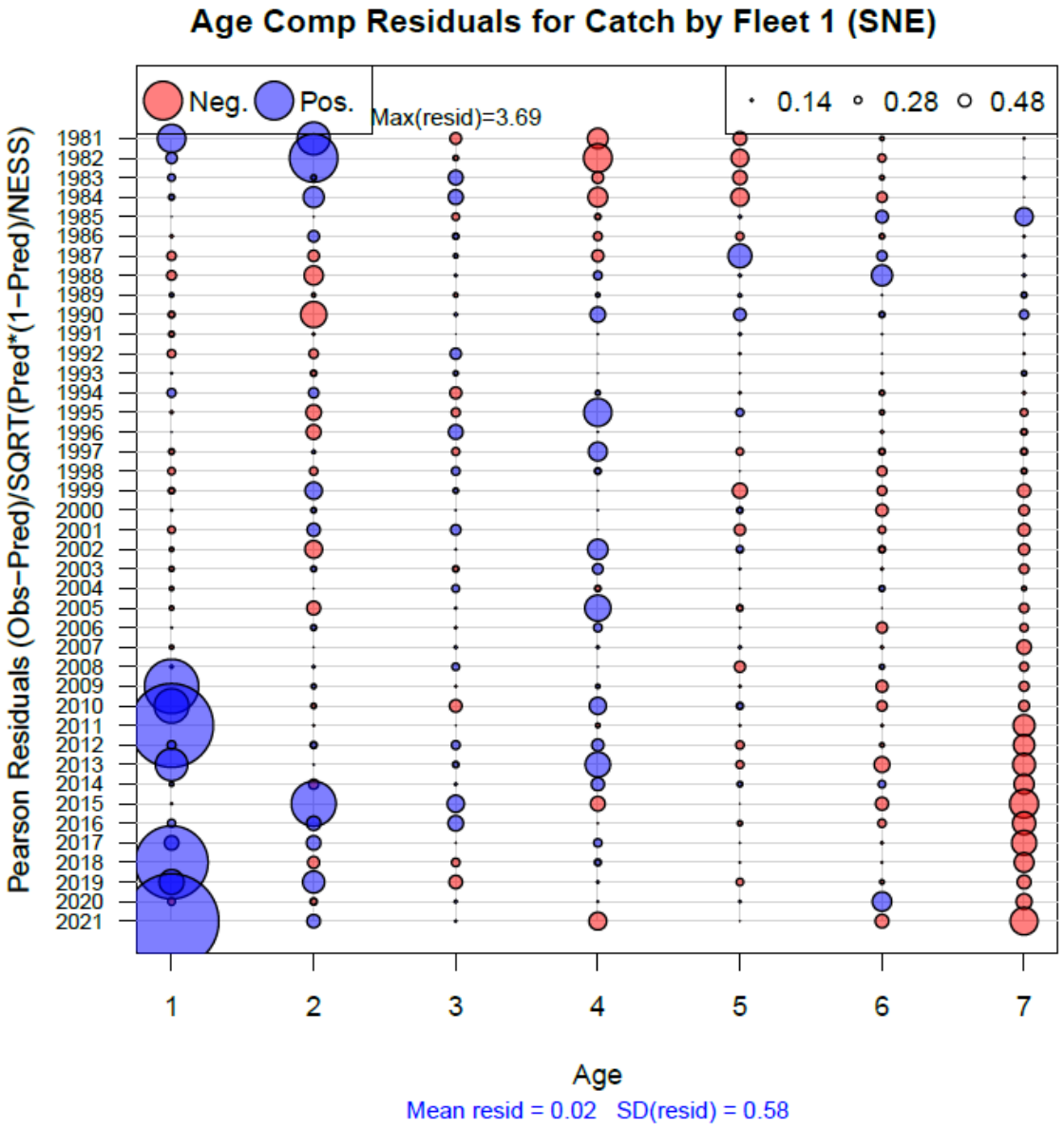
Results: Diagnostics



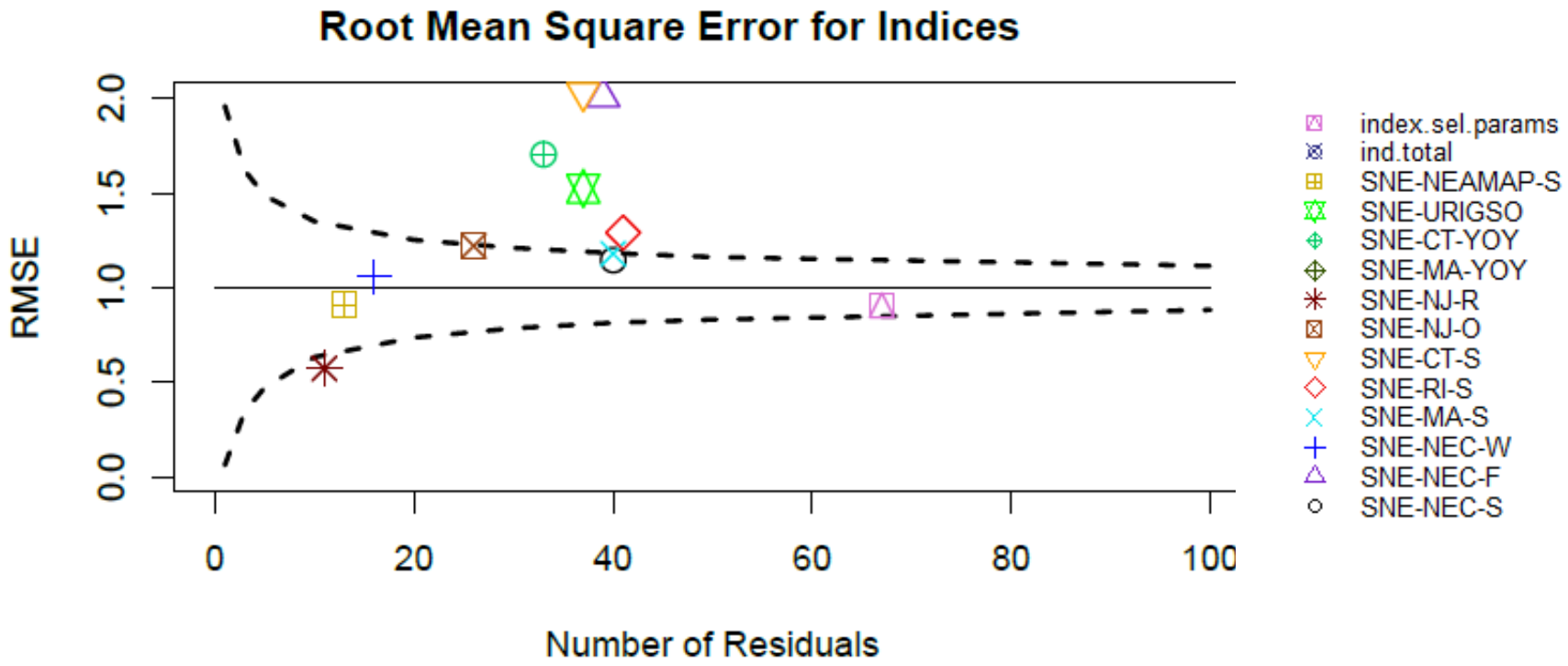
Results: Catch



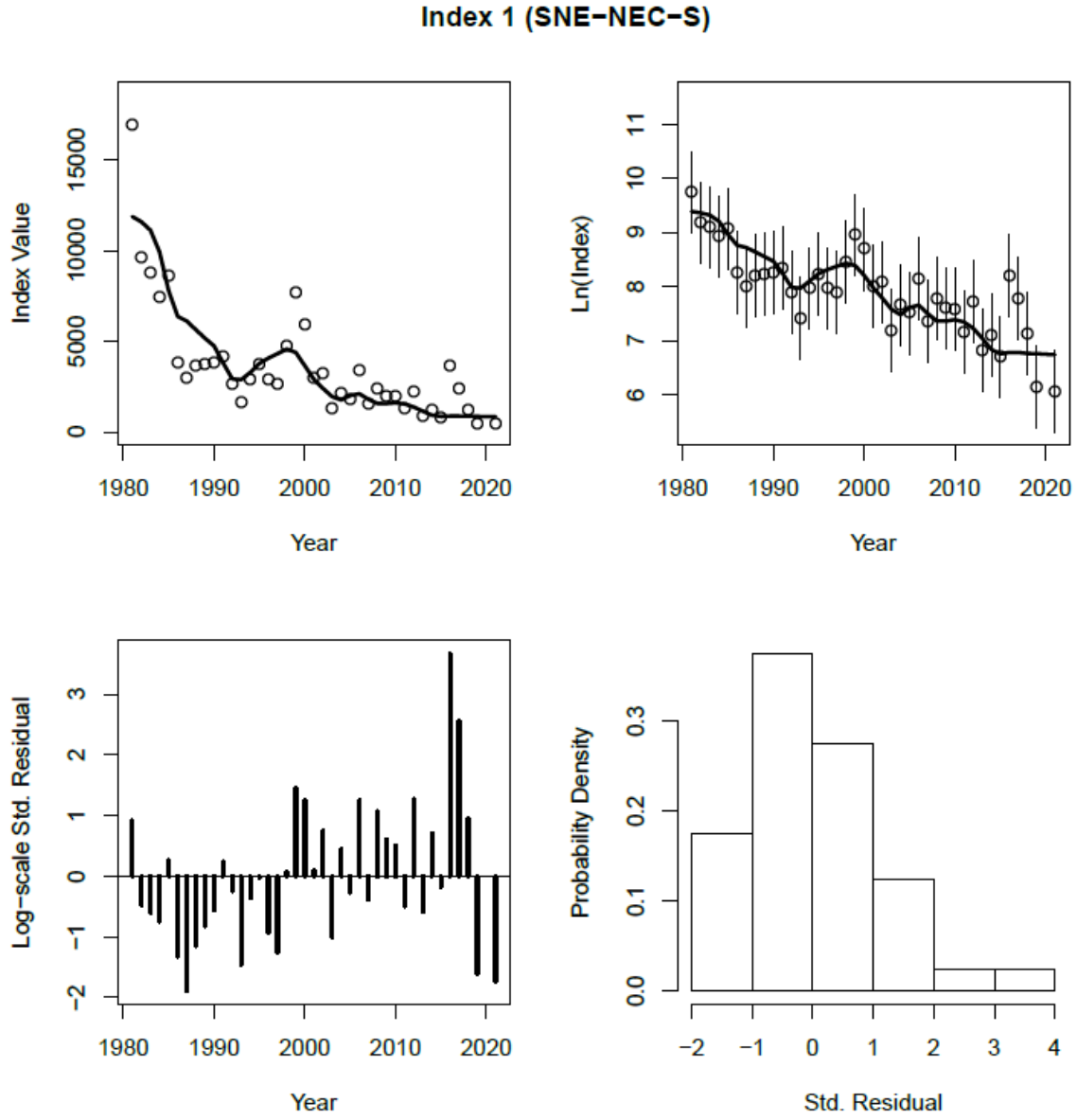
Results: Catch



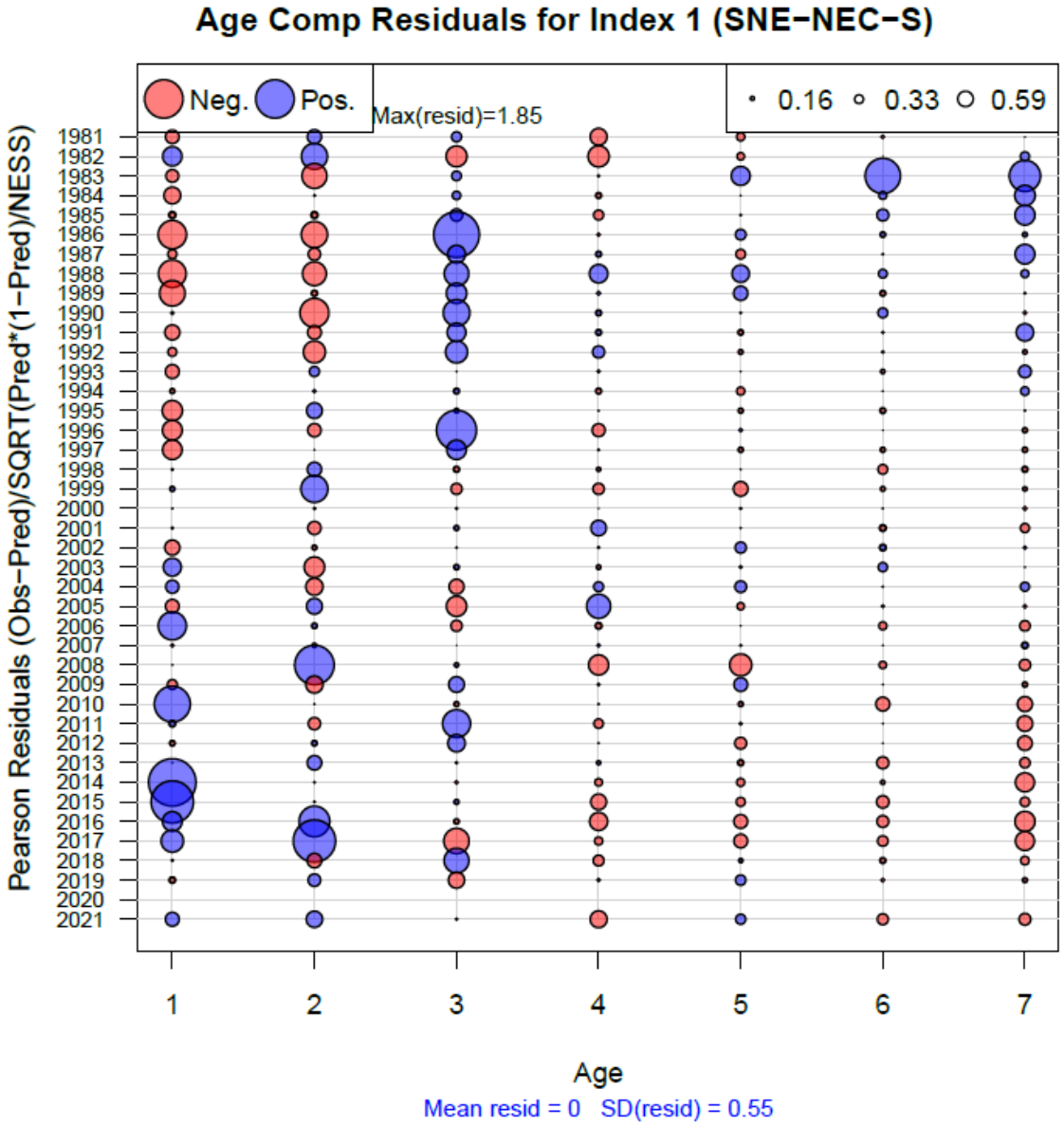
Results: Indices



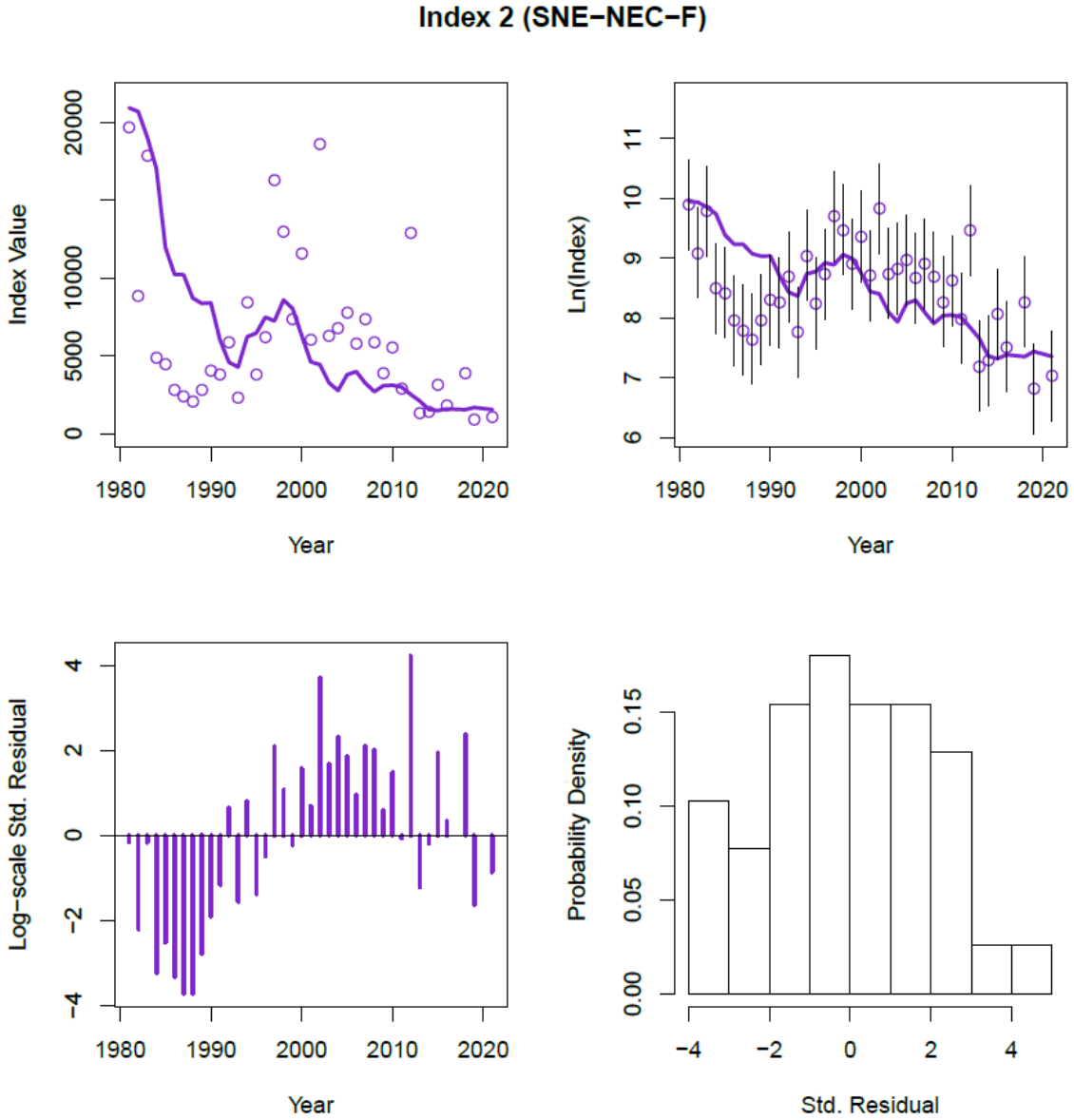
Results: NEFSC S



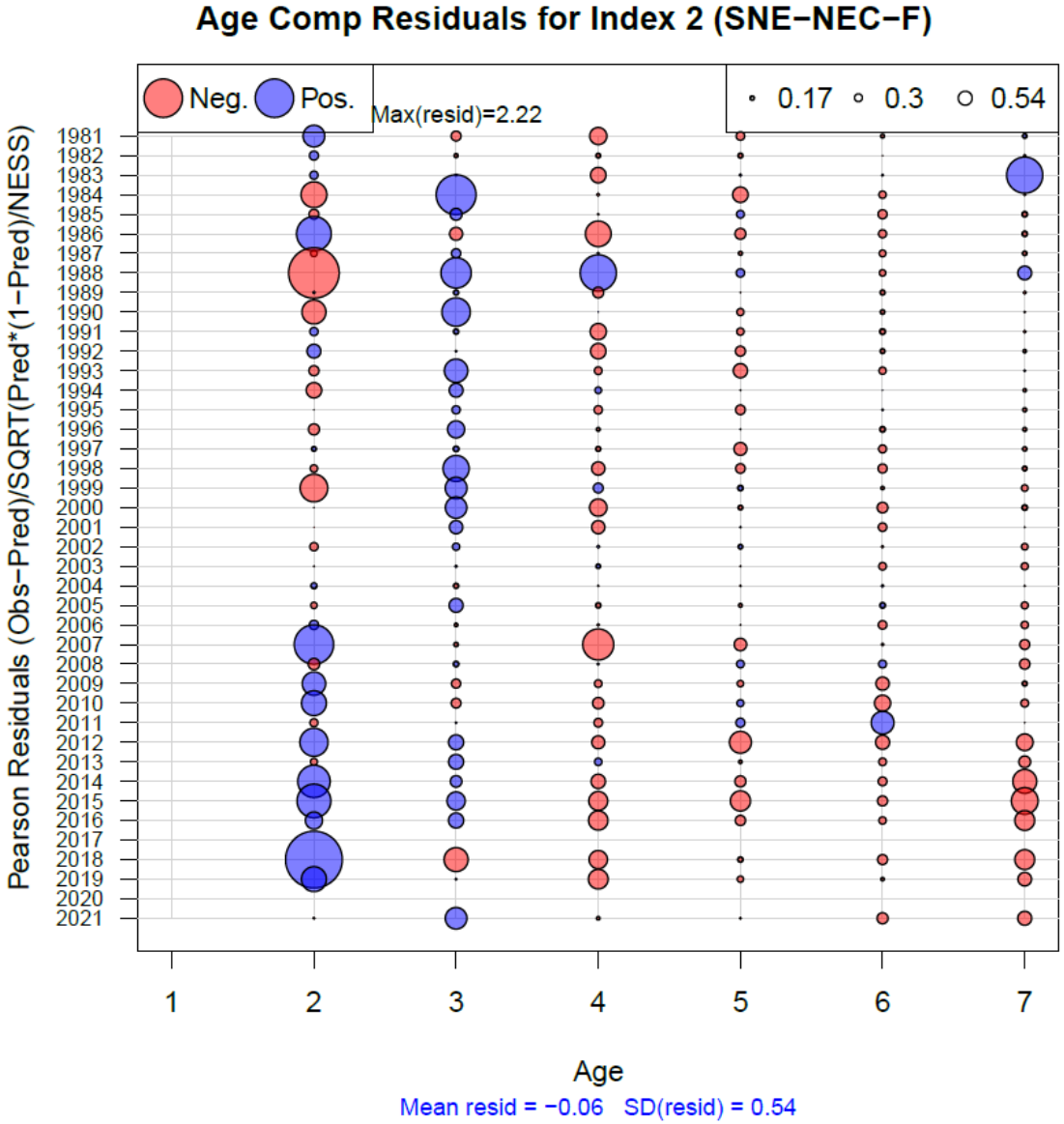
Results: NEFSC S



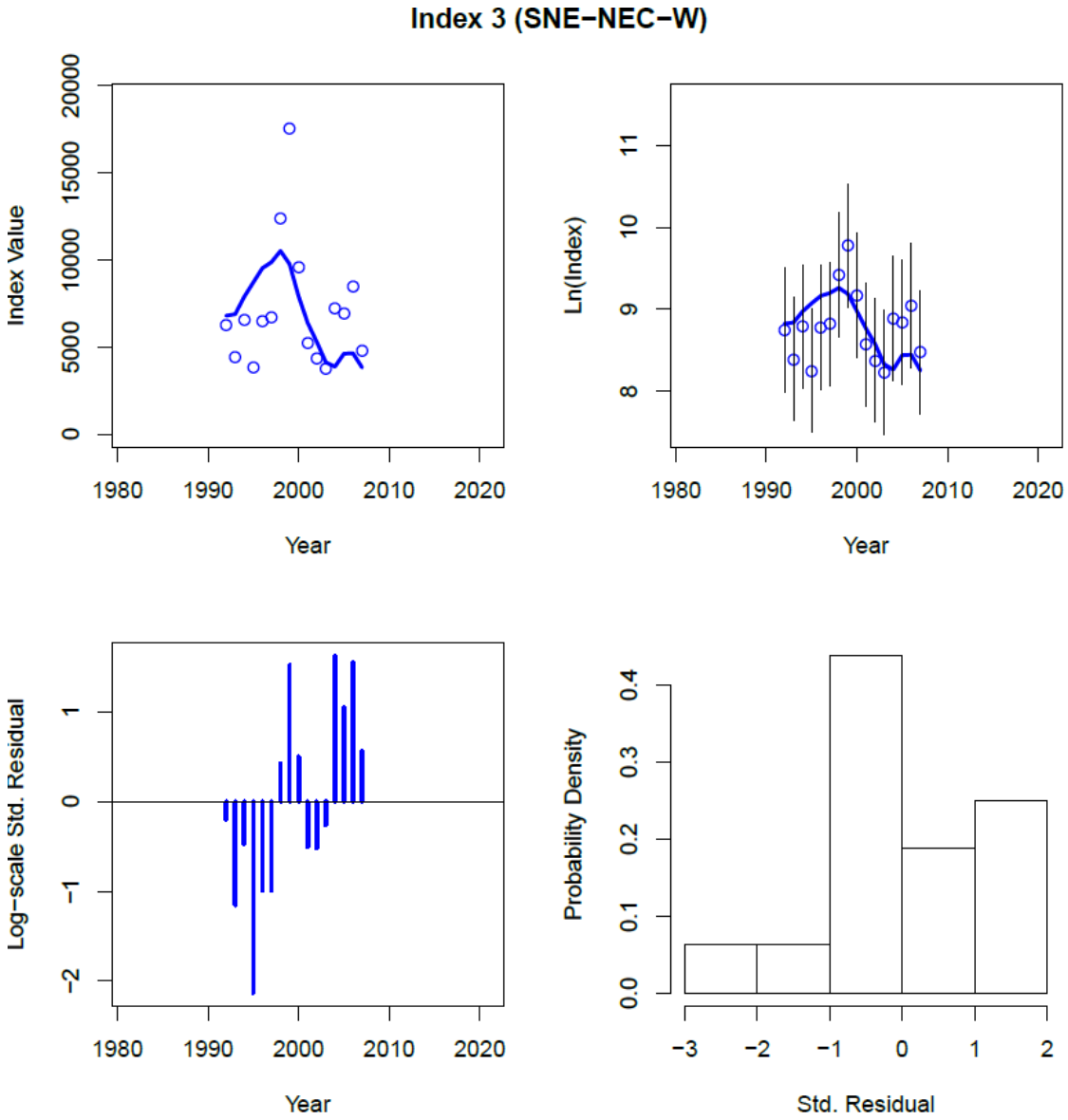
Results: NEFSC F



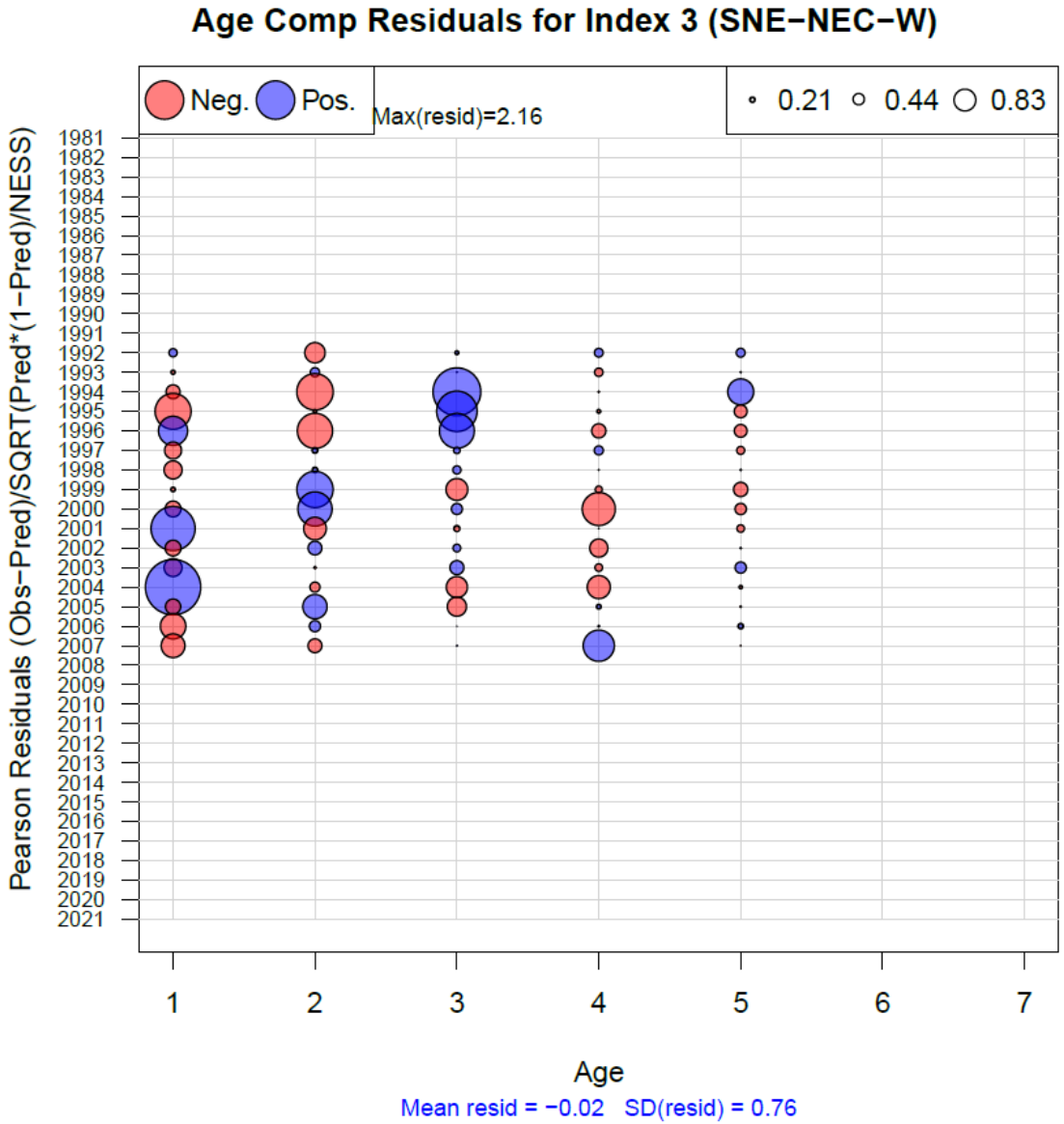
Results: NEFSC F



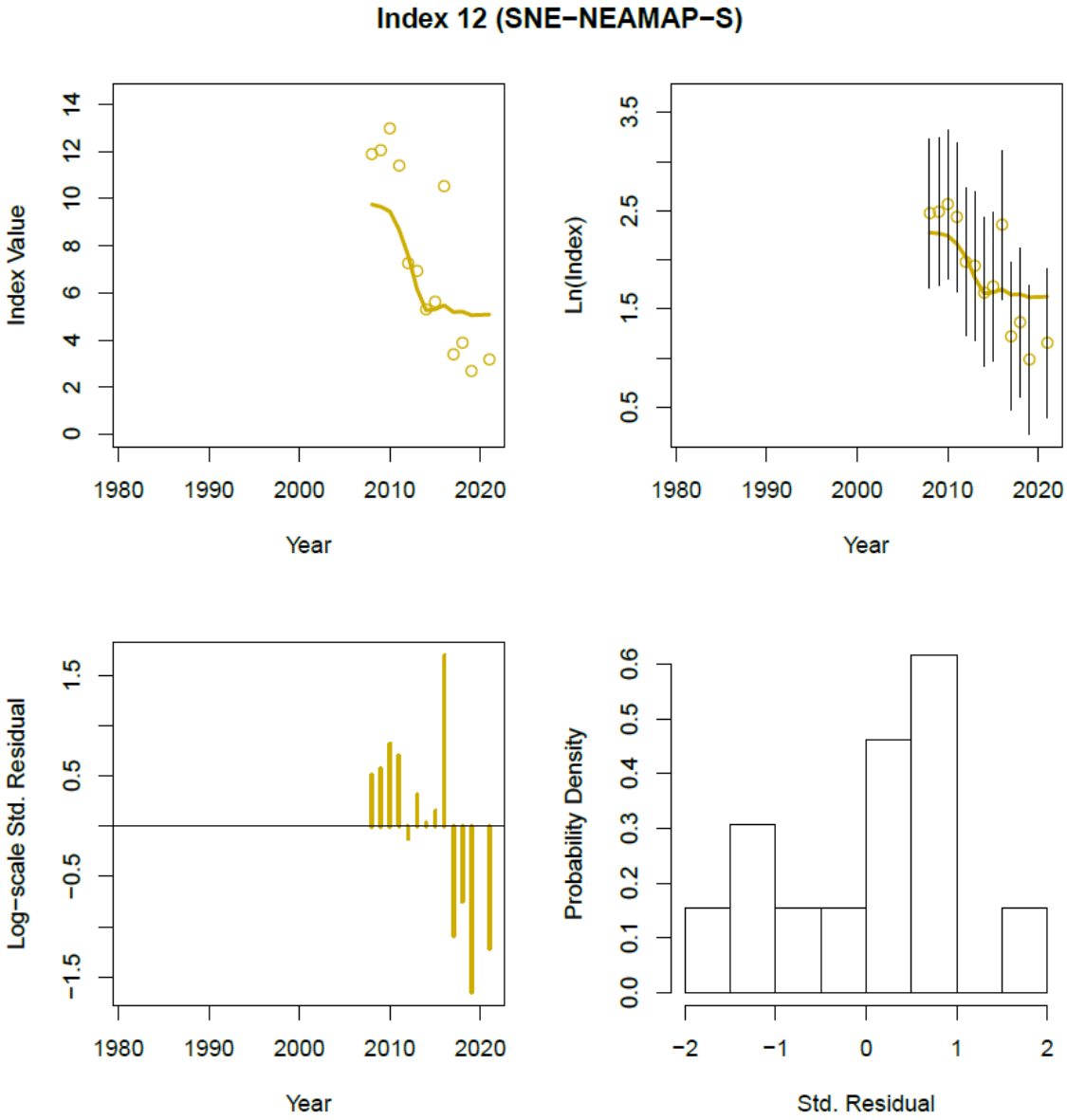
Results: NEFSC W



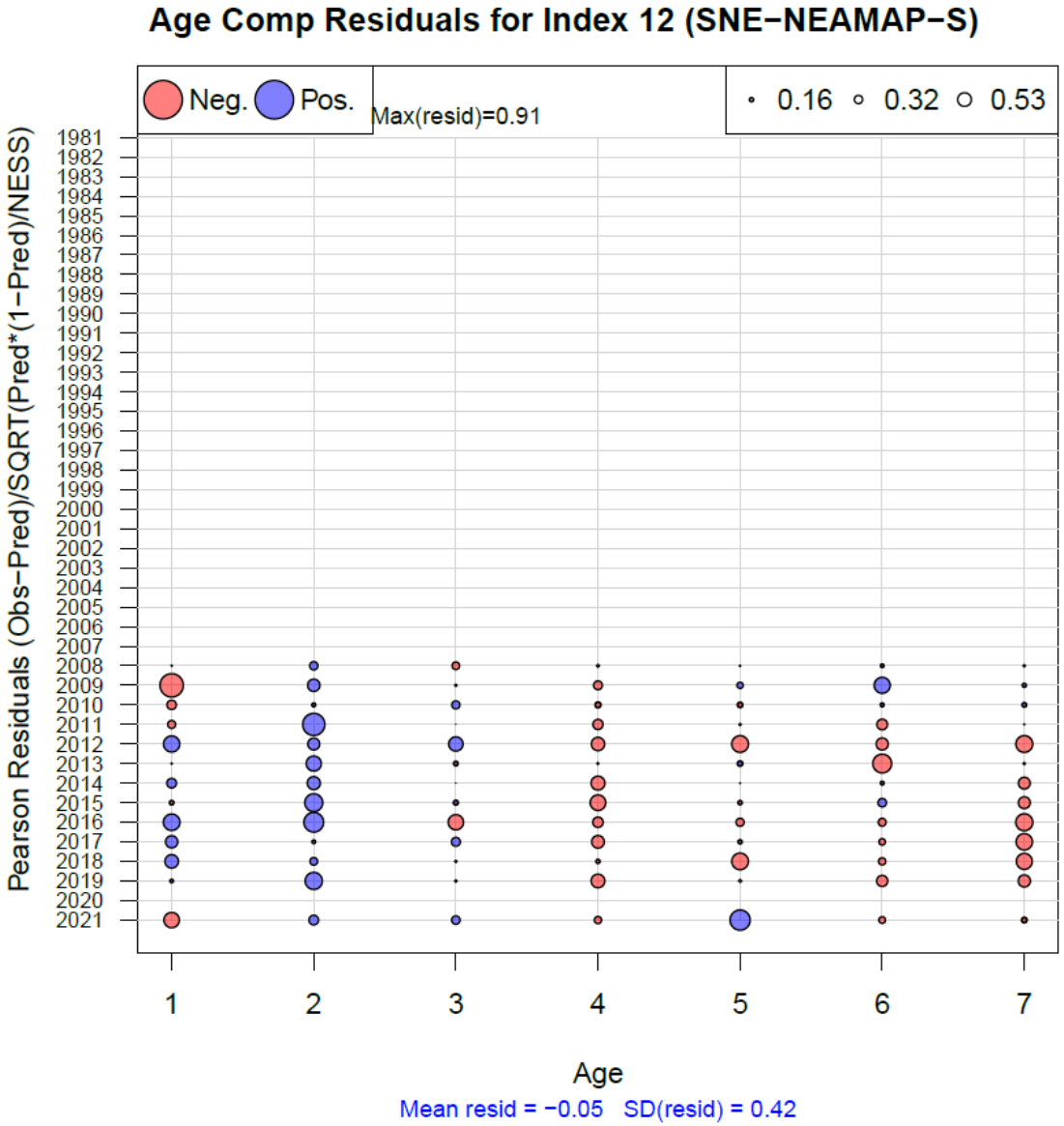
Results: NEFSC W



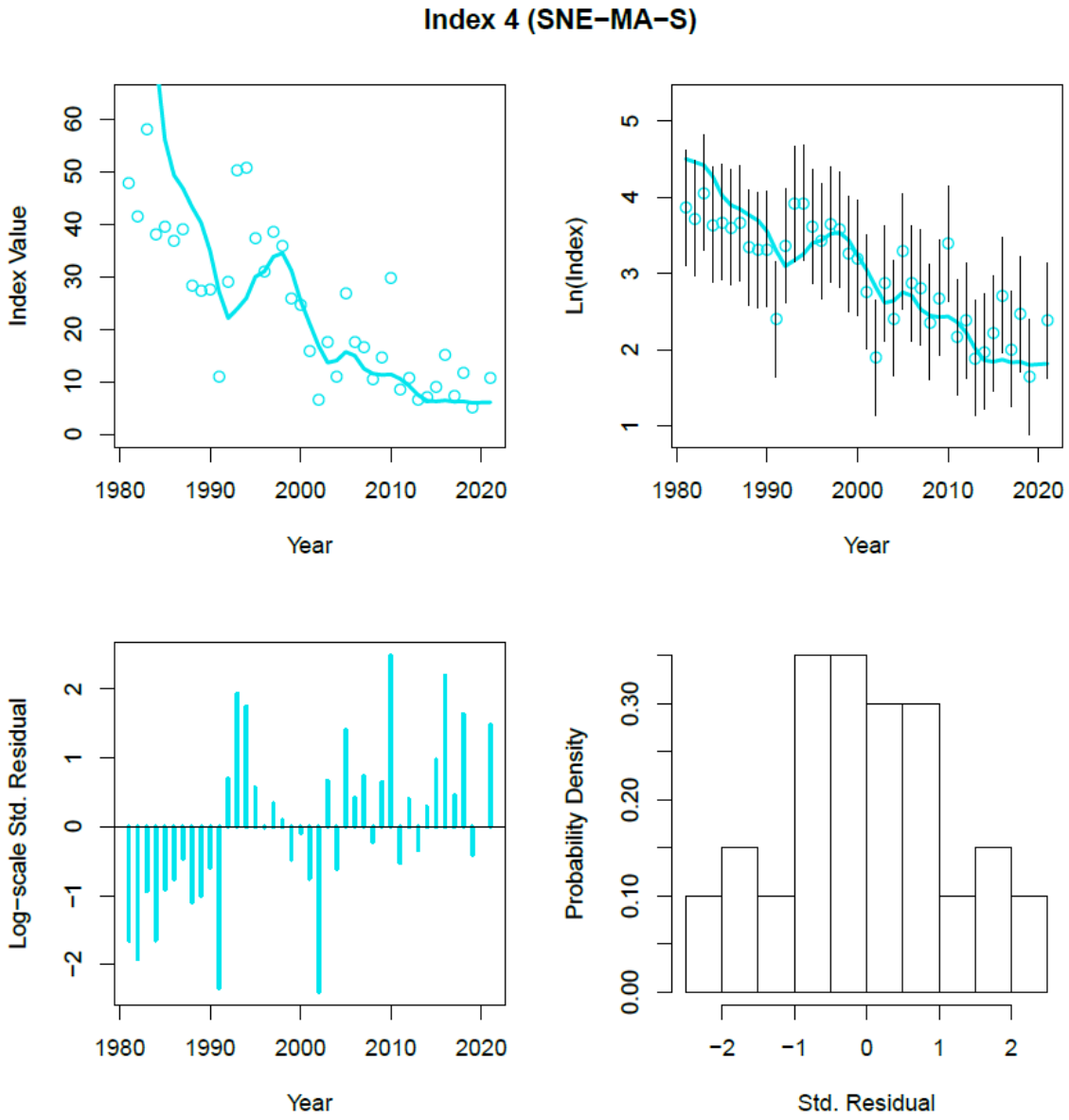
Results: NEAMAP S



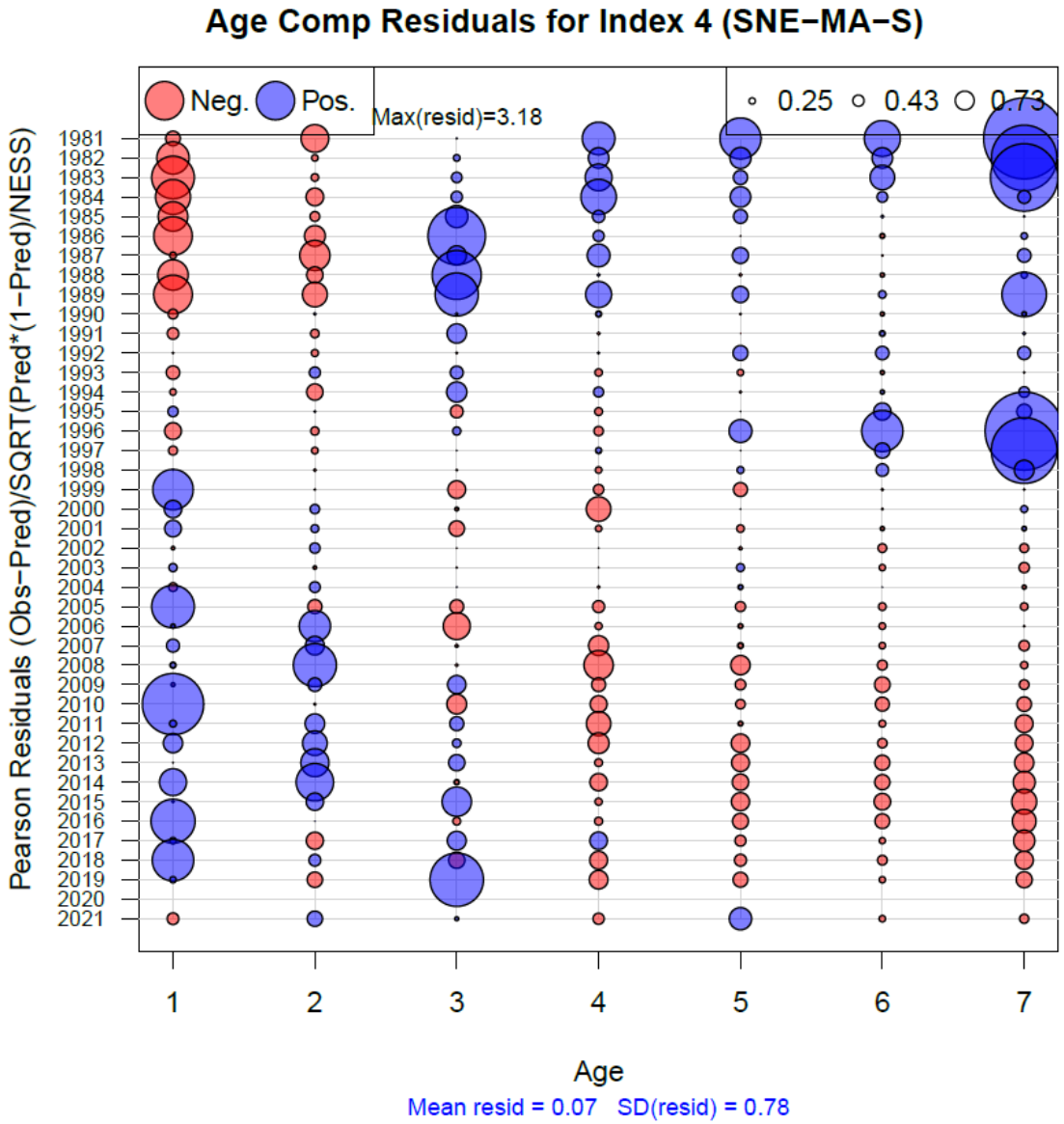
Results: NEAMAP S



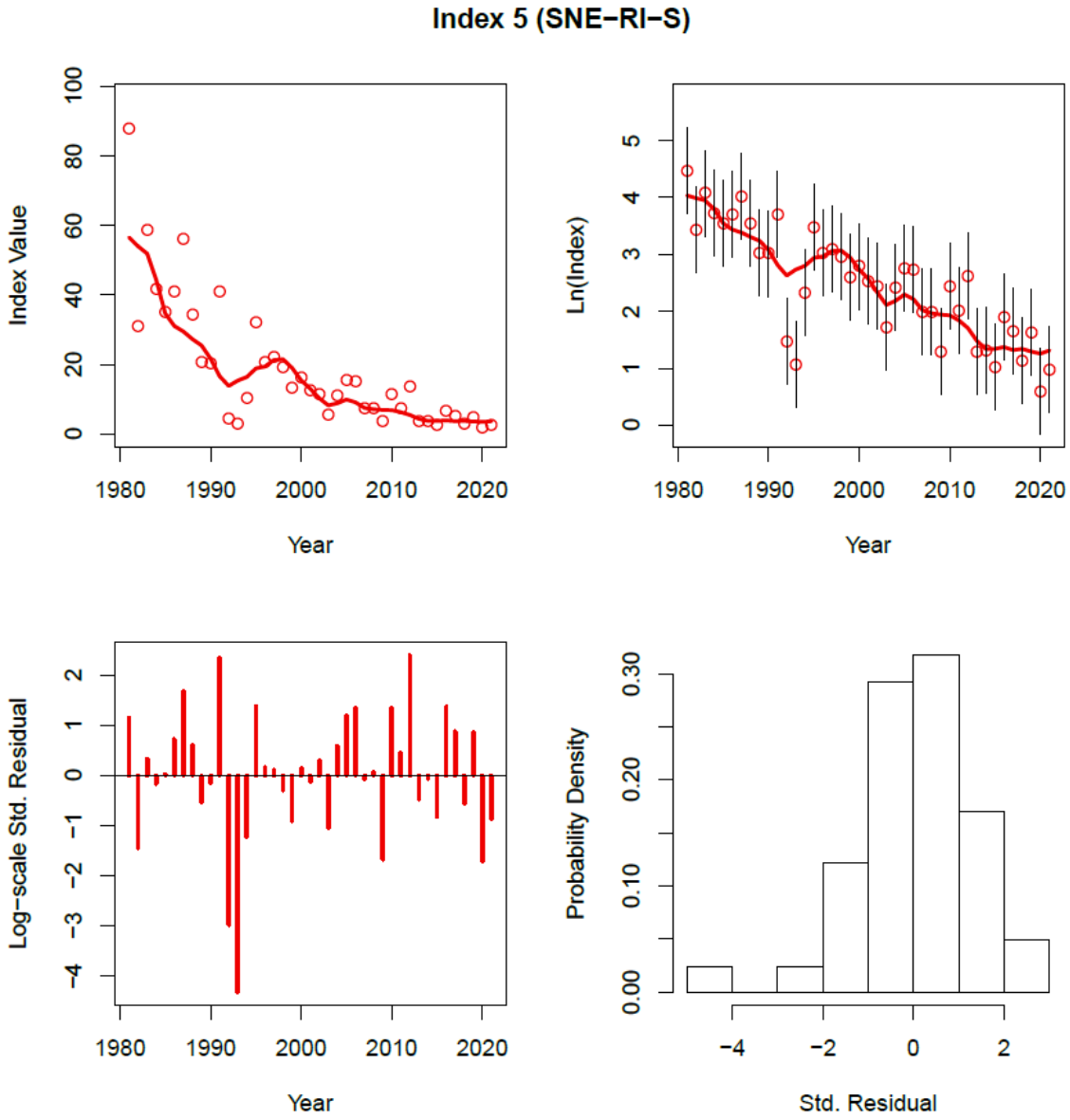
Results: MADMF S



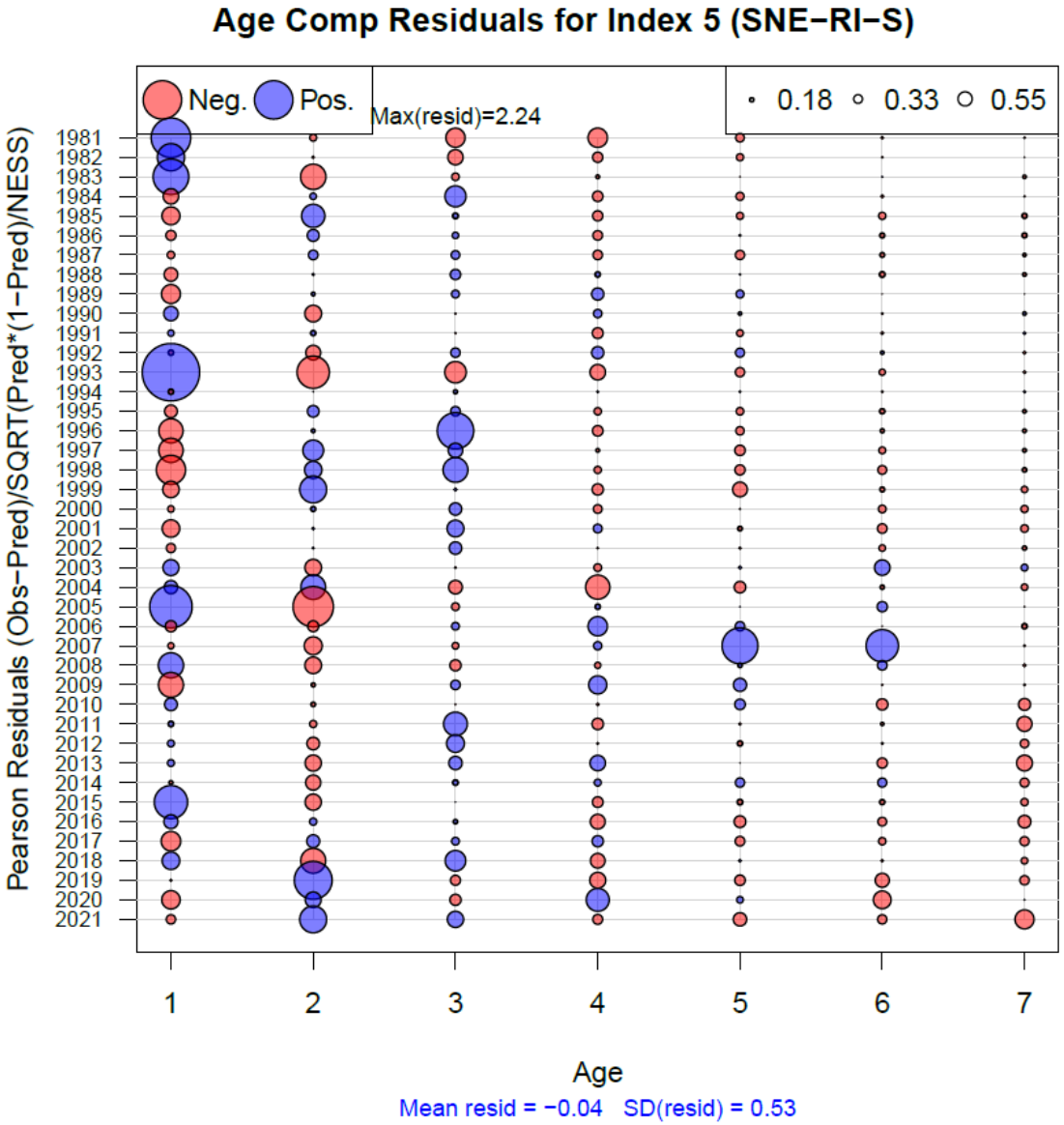
Results: MADMF S



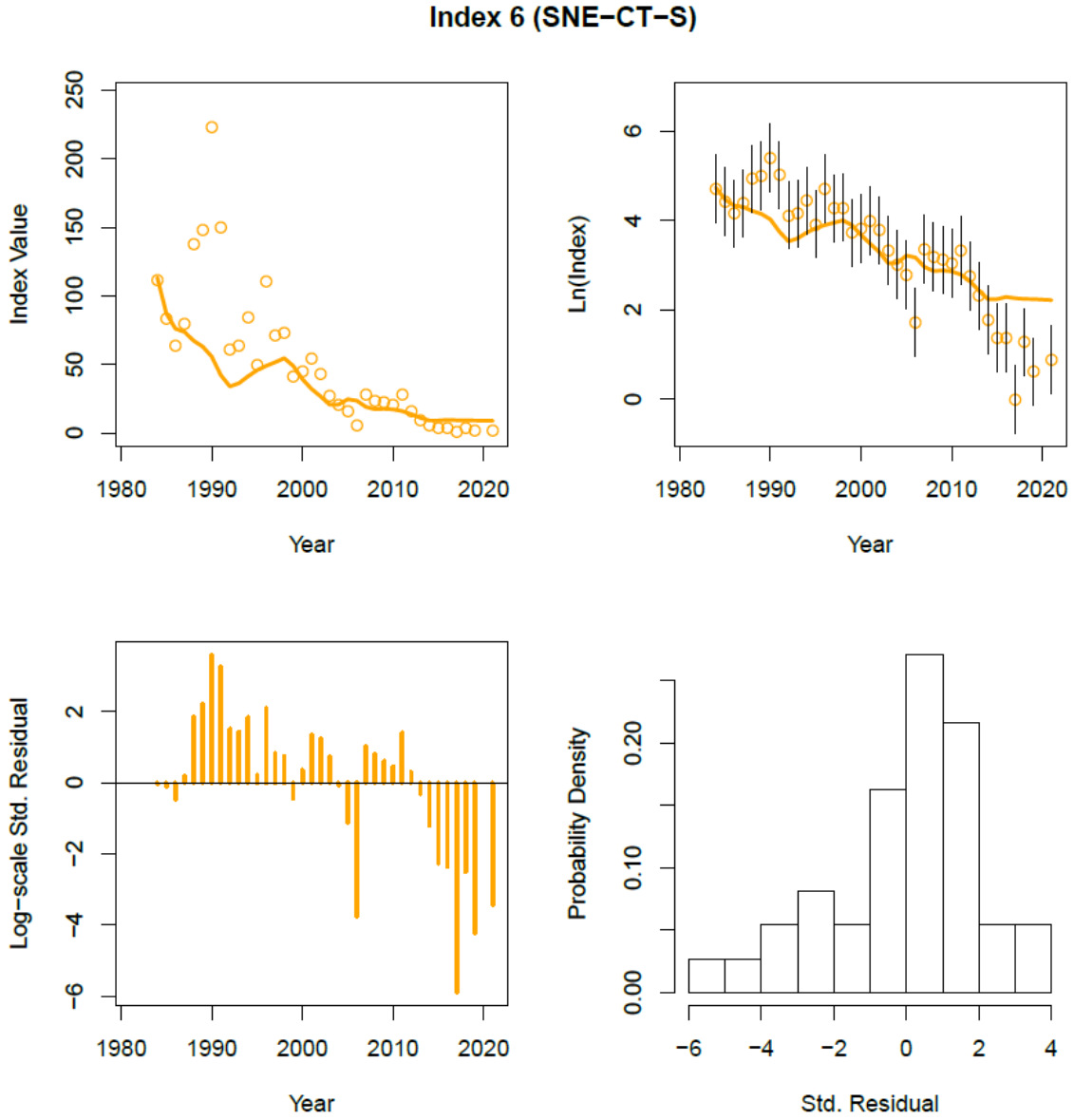
Results: RIDFW S



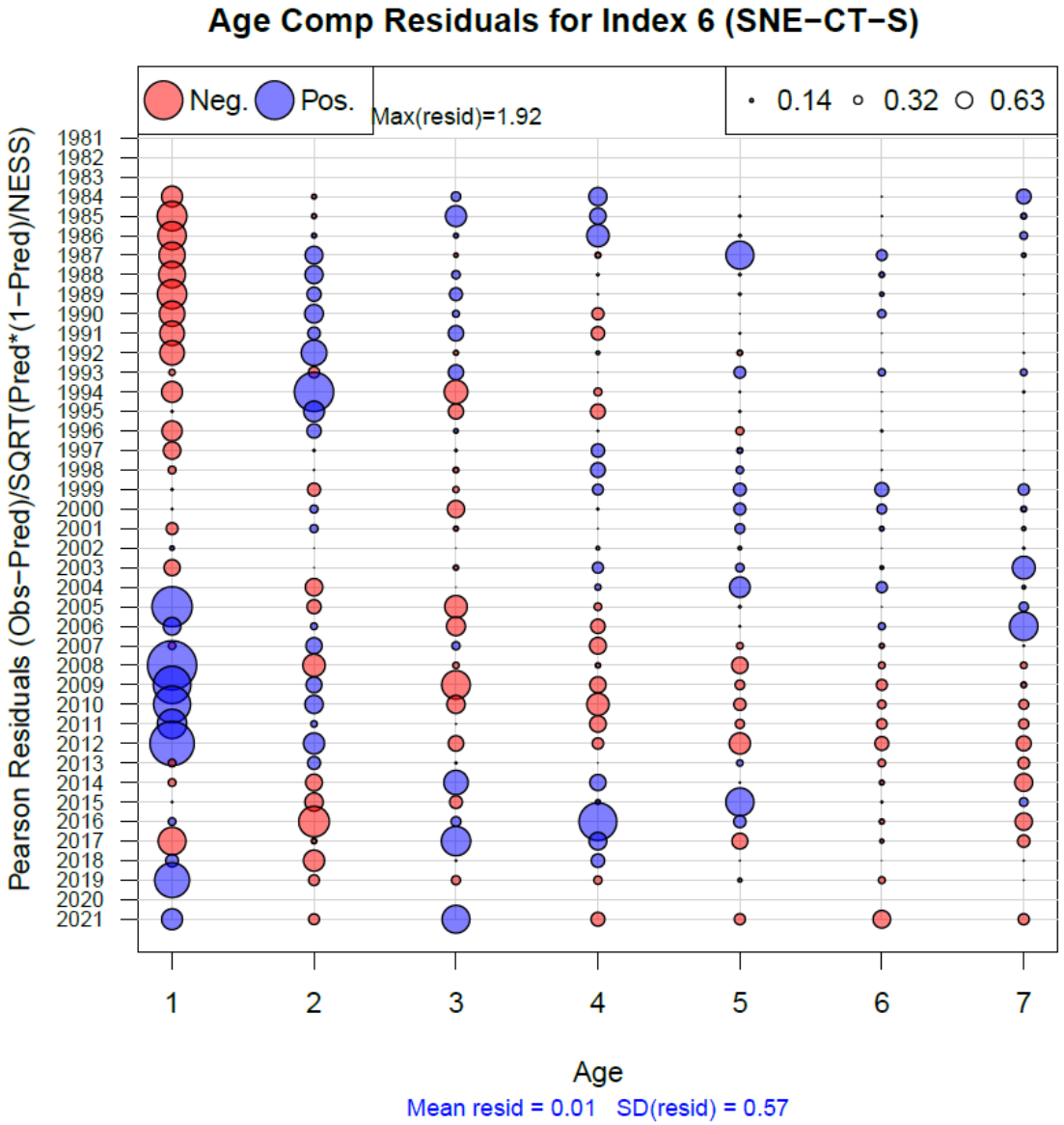
Results: RIDFW S



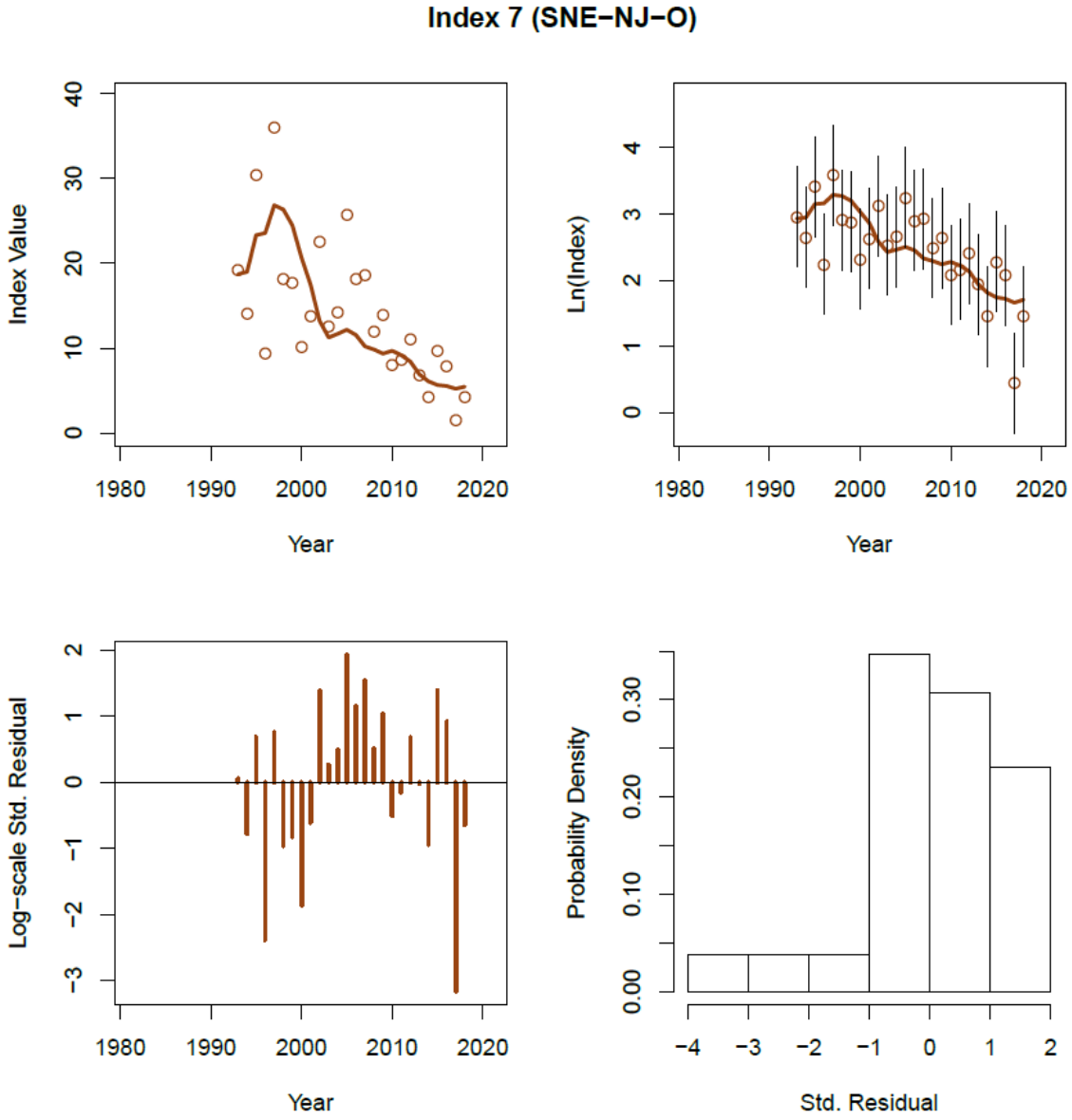
Results: CTDEP



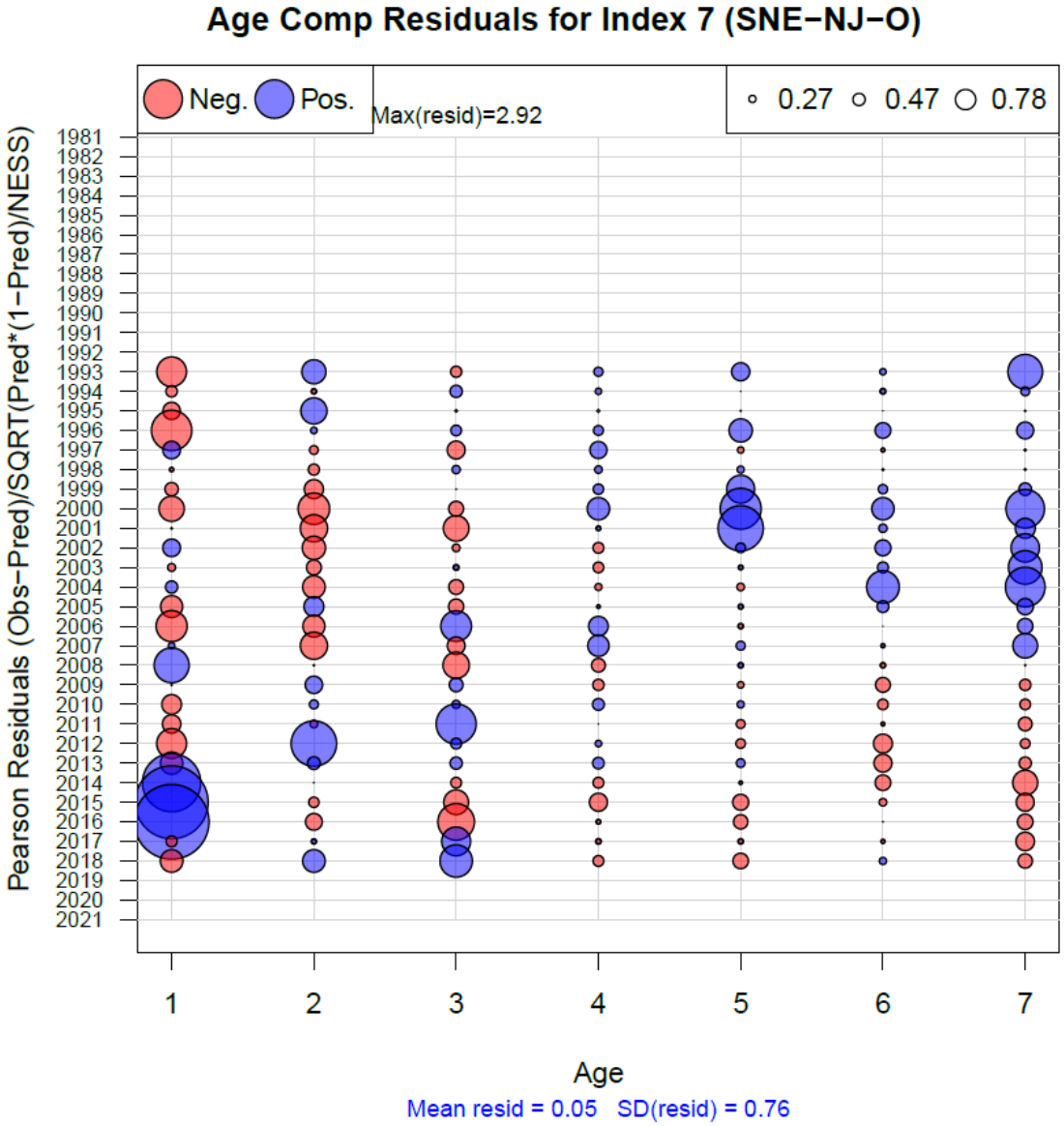
Results: CTDEP



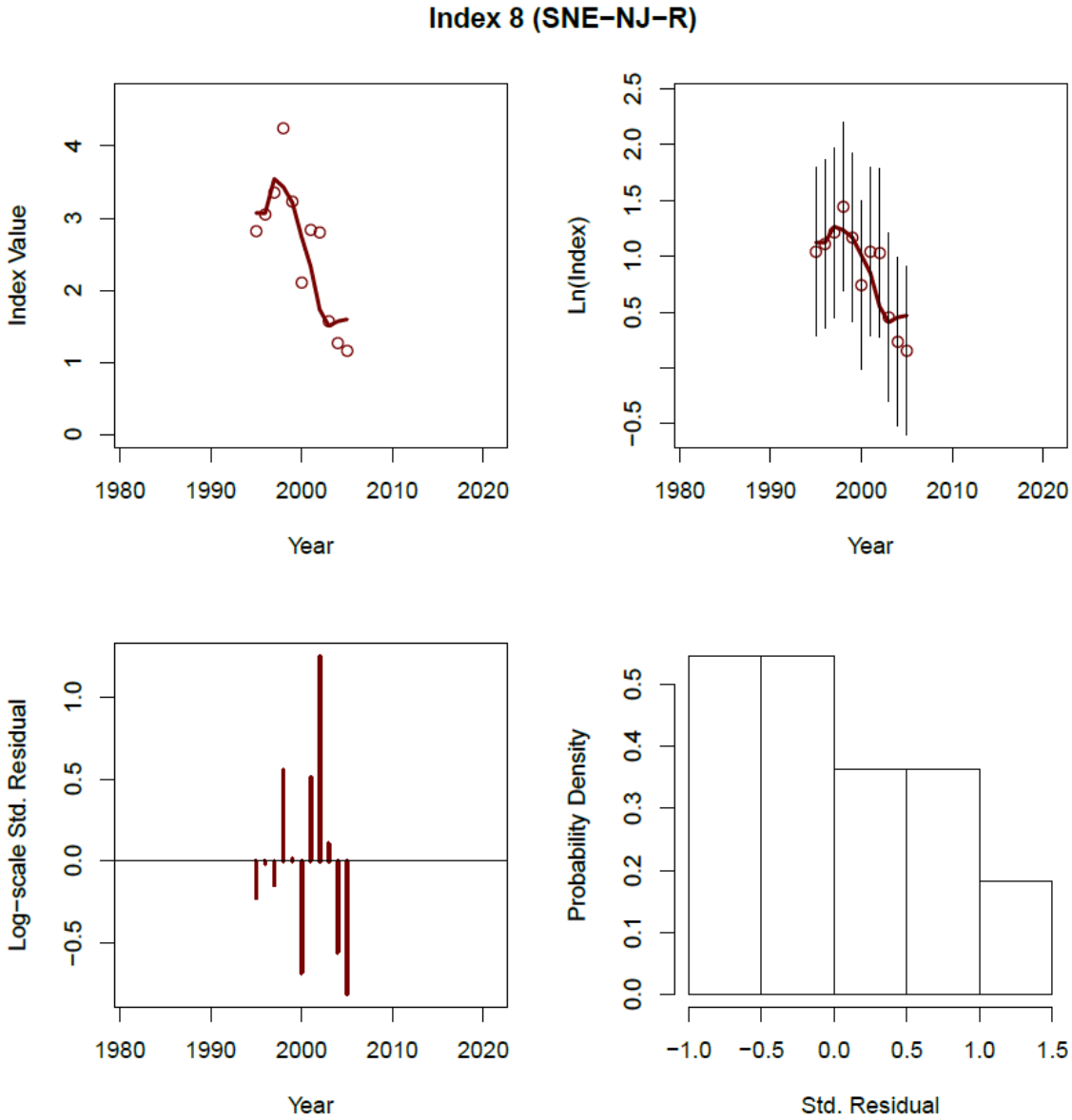
Results: NJ Ocean



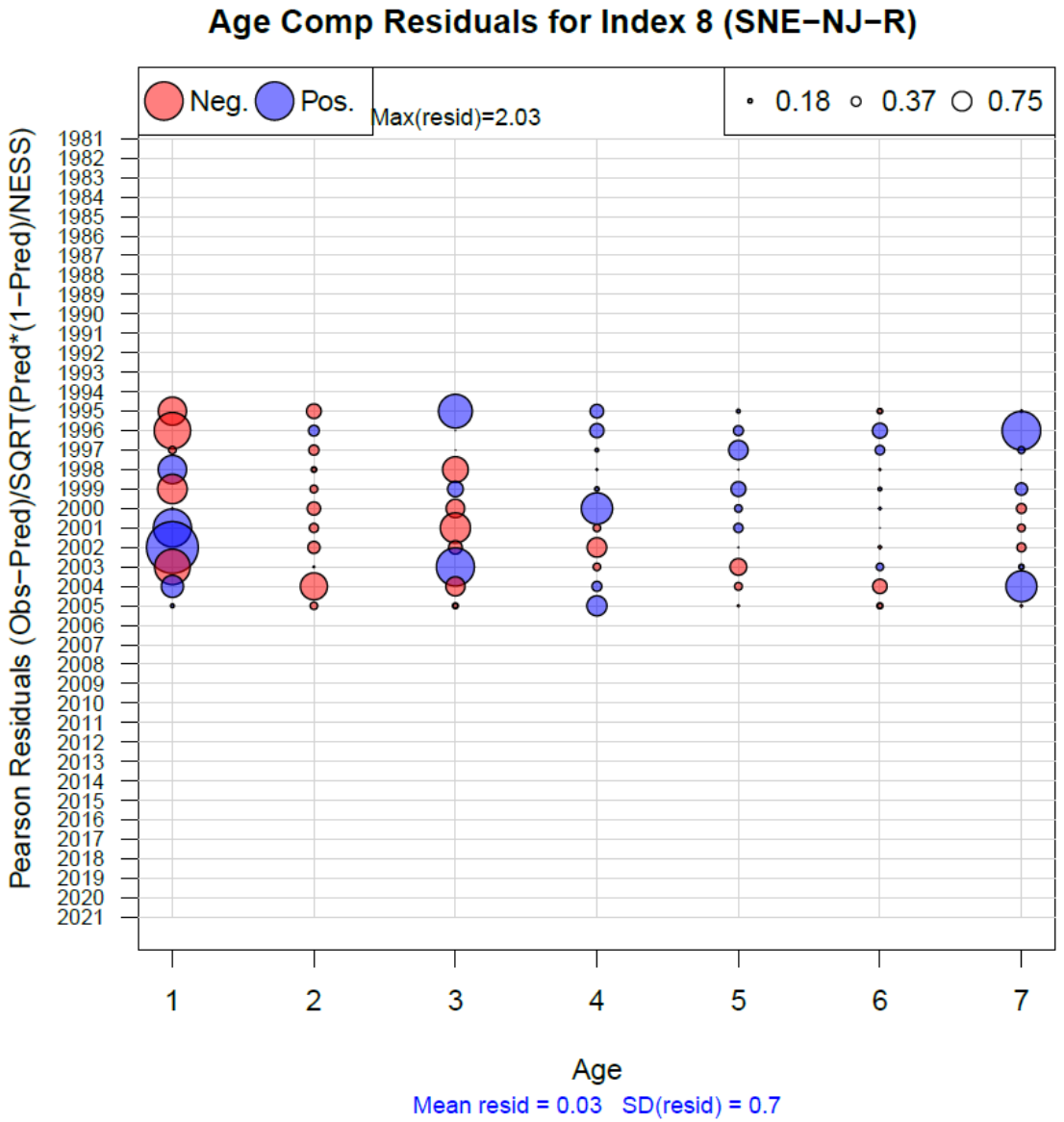
Results: NJ Ocean



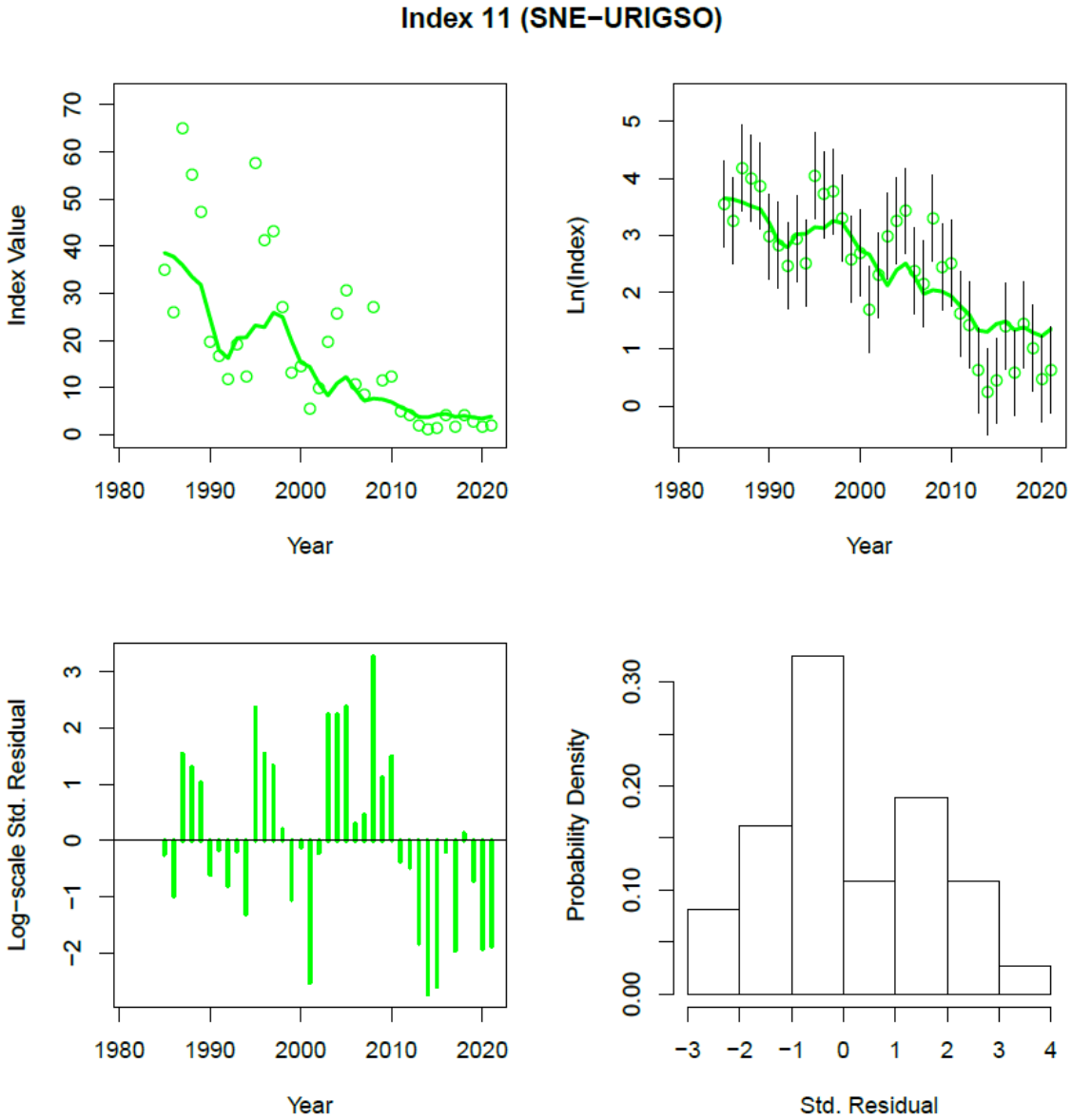
Results: NJ River



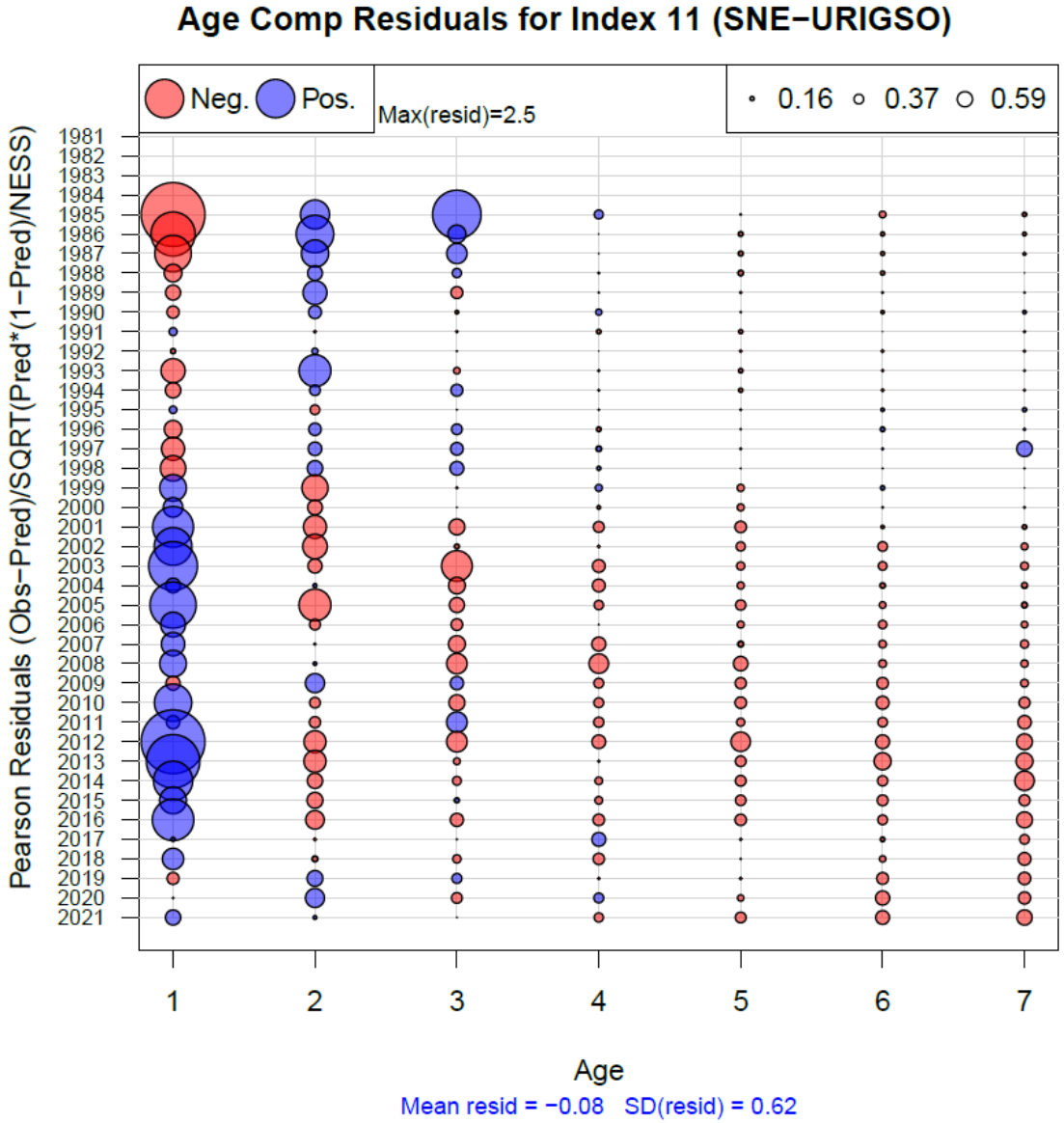
Results: NJ River



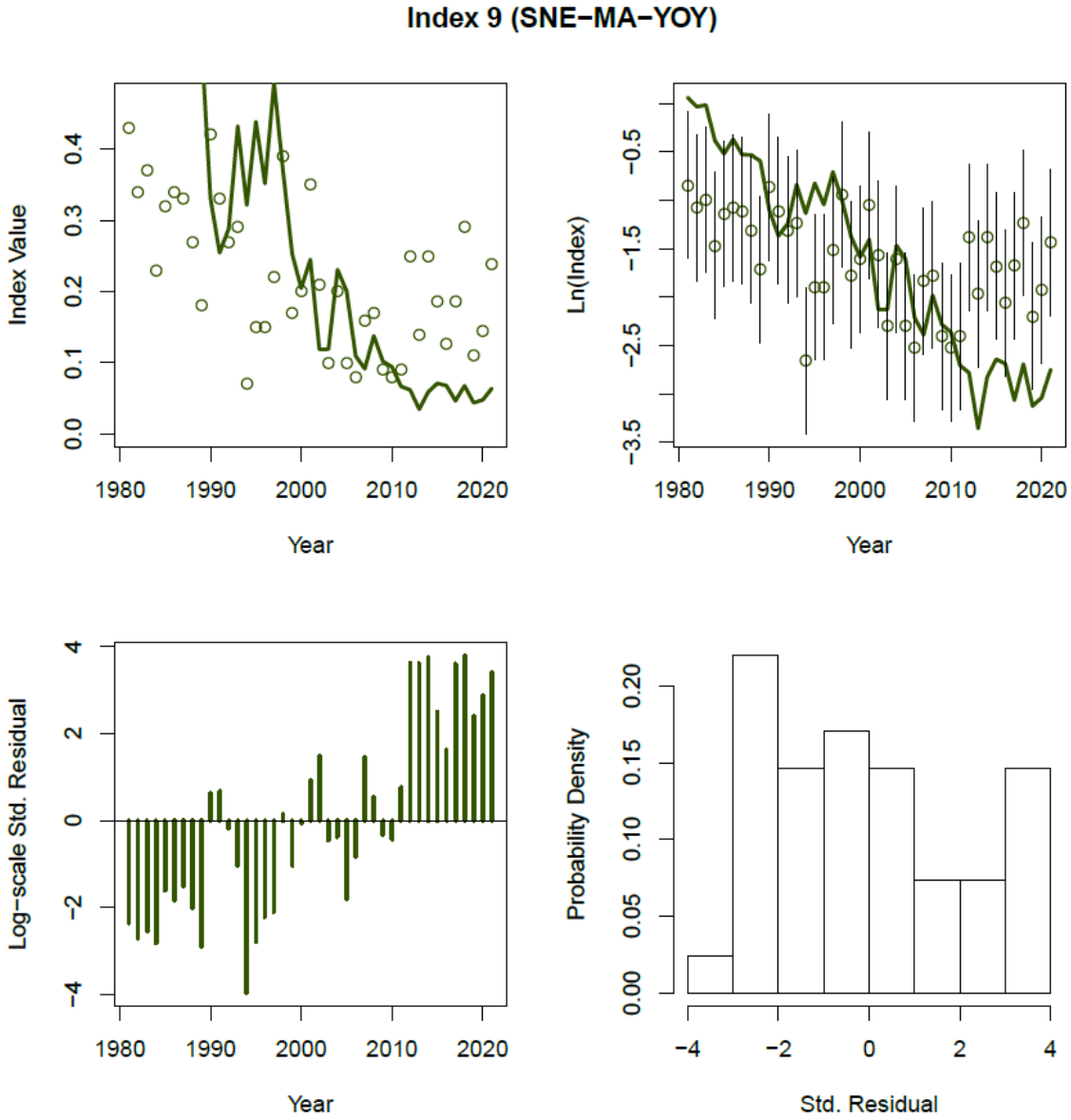
Results: URIGSO



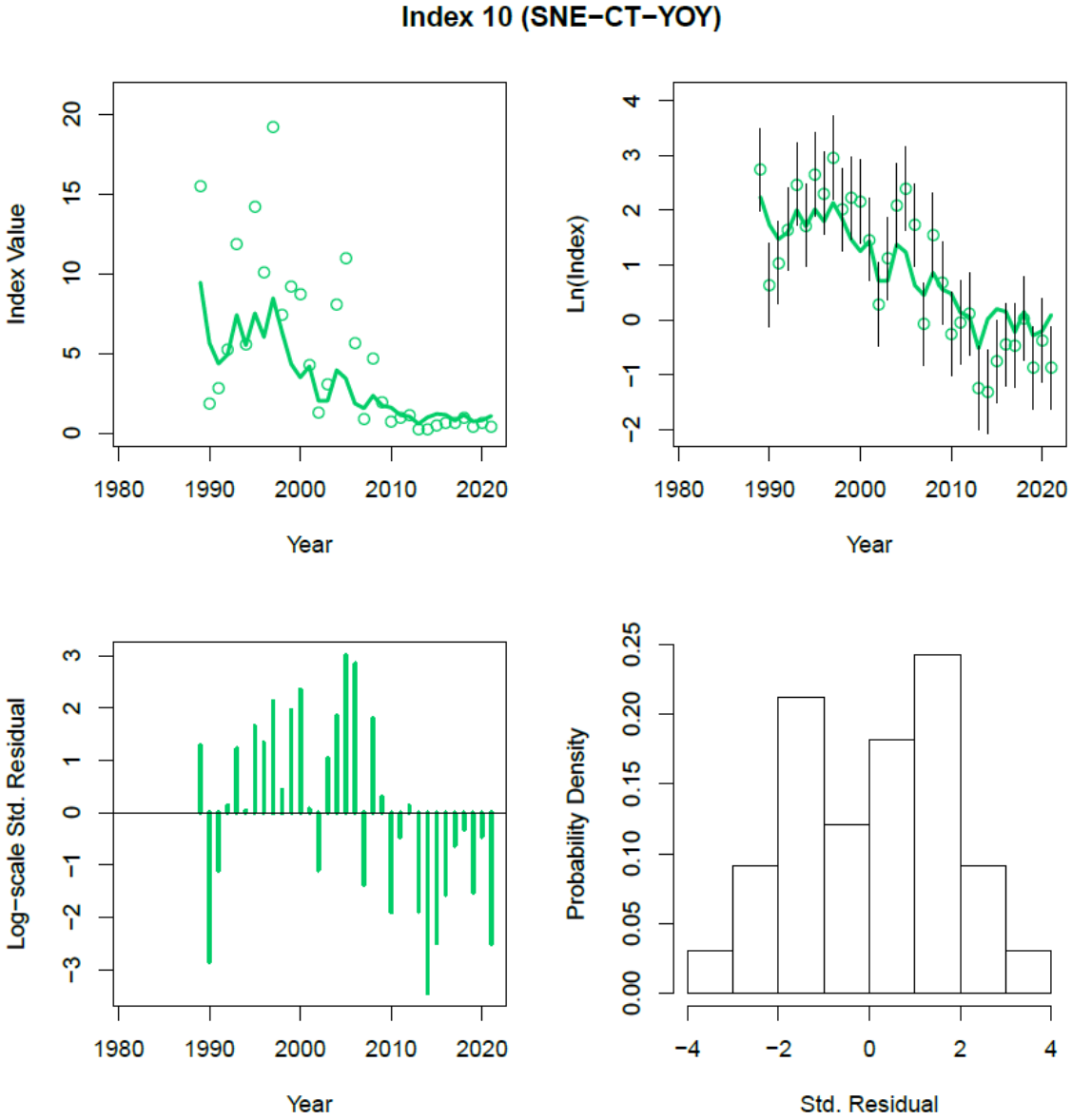
Results: URIGSO



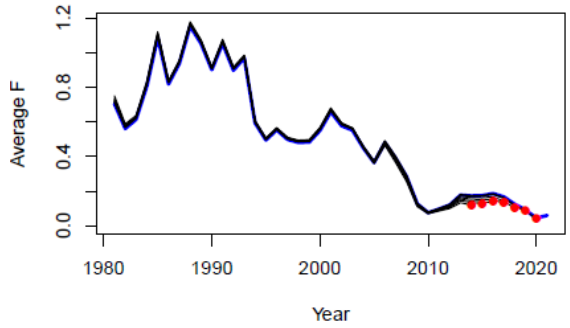
Results: MA YoY

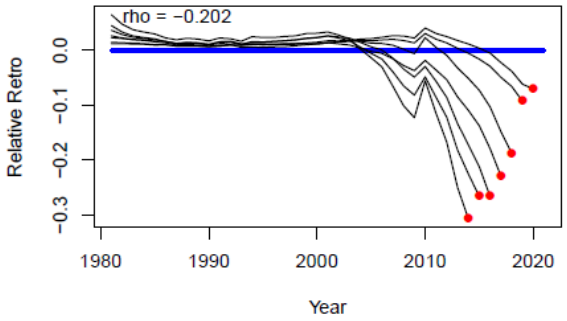


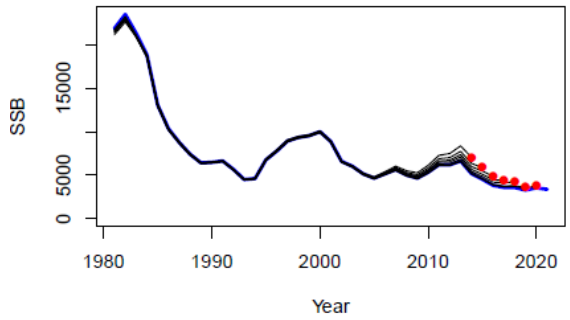
Results: CT YoY

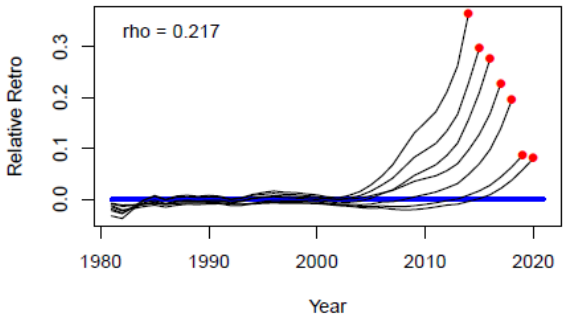


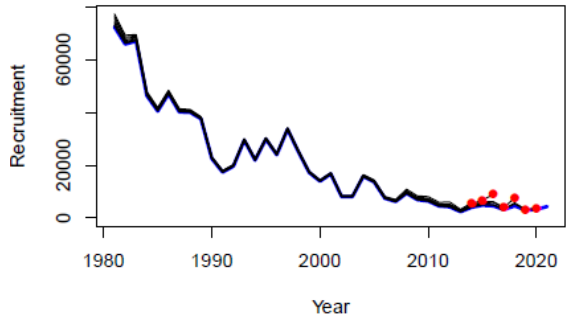
Results: Retrospective bias

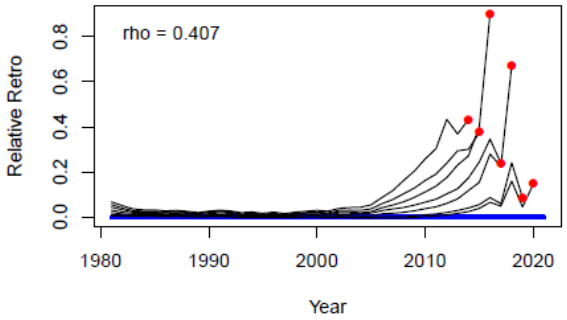






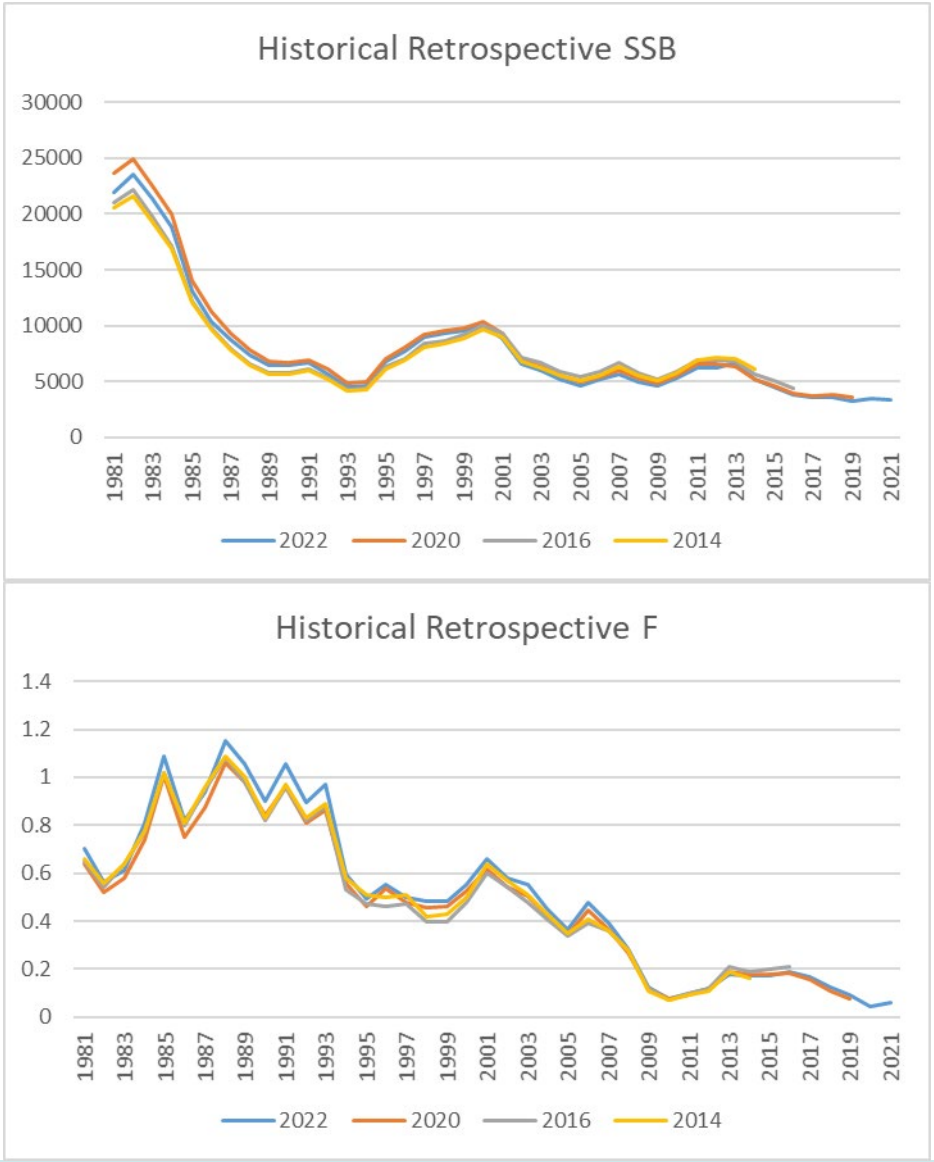






- Retrospective bias has decreased in F, SSB, and R since 2020 MT
- Considered a minor retro

Results: Historical Retrospective

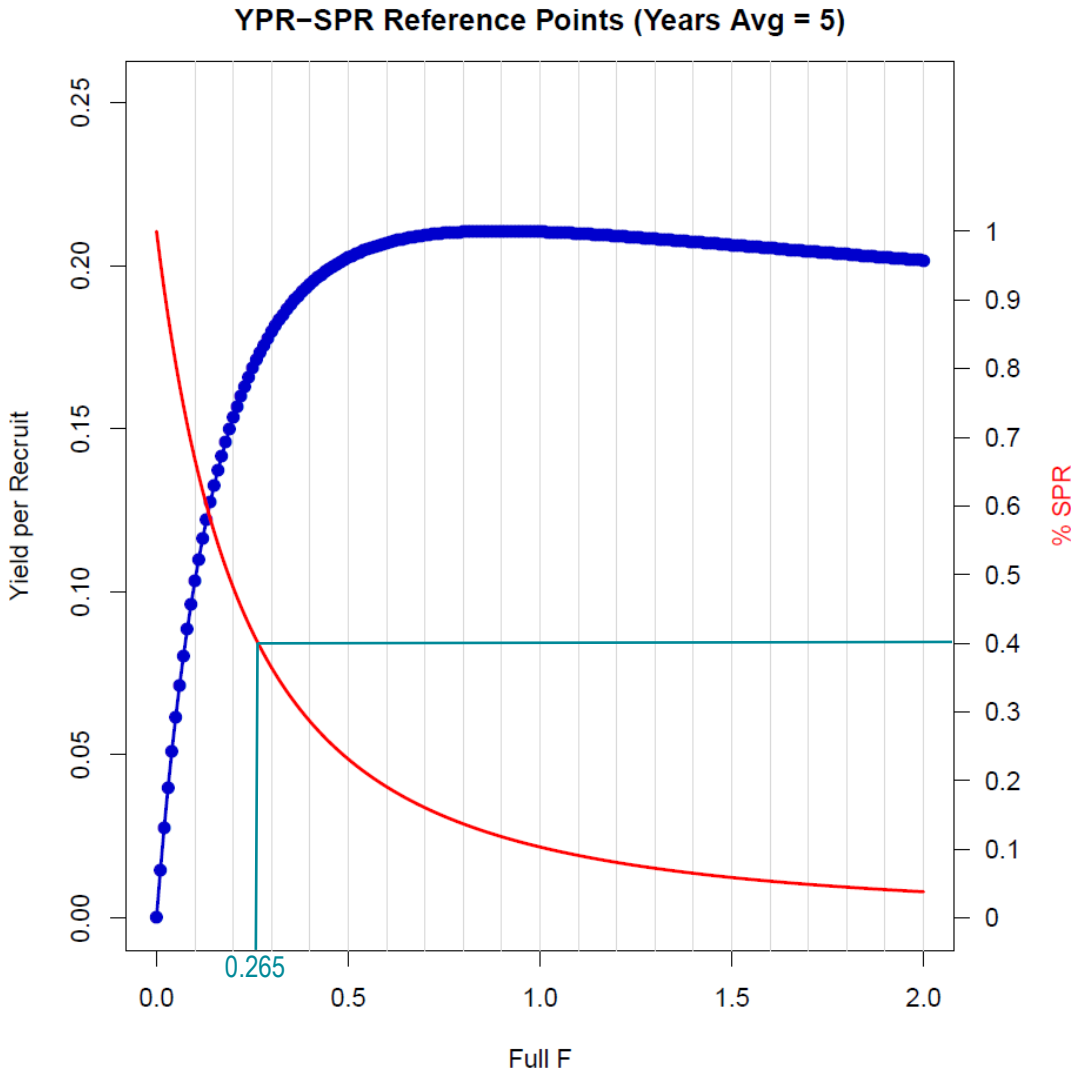


TOR 4: Re-estimate or update the BRP's as defined by the management track level and recommend stock status. Also, provide qualitative descriptions of stock status based on simple indicators/metrics (e.g., age- and size-structure, temporal trends in population size or recruitment indices, etc.).

2020 MT Reference Points

- F2019 = 0.077, SSB2019 = 3,638 mt
- $F_{40\%}$ = $FMSY_{proxy}$ = 0.284 (Fthreshold)
- SSBMSY = 12,322 mt (Btarget)
- ½ SSBMSY = 6,161 mt (Bthreshold)
- MSY = 3,906 mt
- F2019/Fthreshold = 27%%, SSB2019/SSBtarget = 30%, SSB2019/SSBthreshold = 60%
- Overfished, overfishing not occurring

2022 MT %SPR40 proxy reference for FMSY

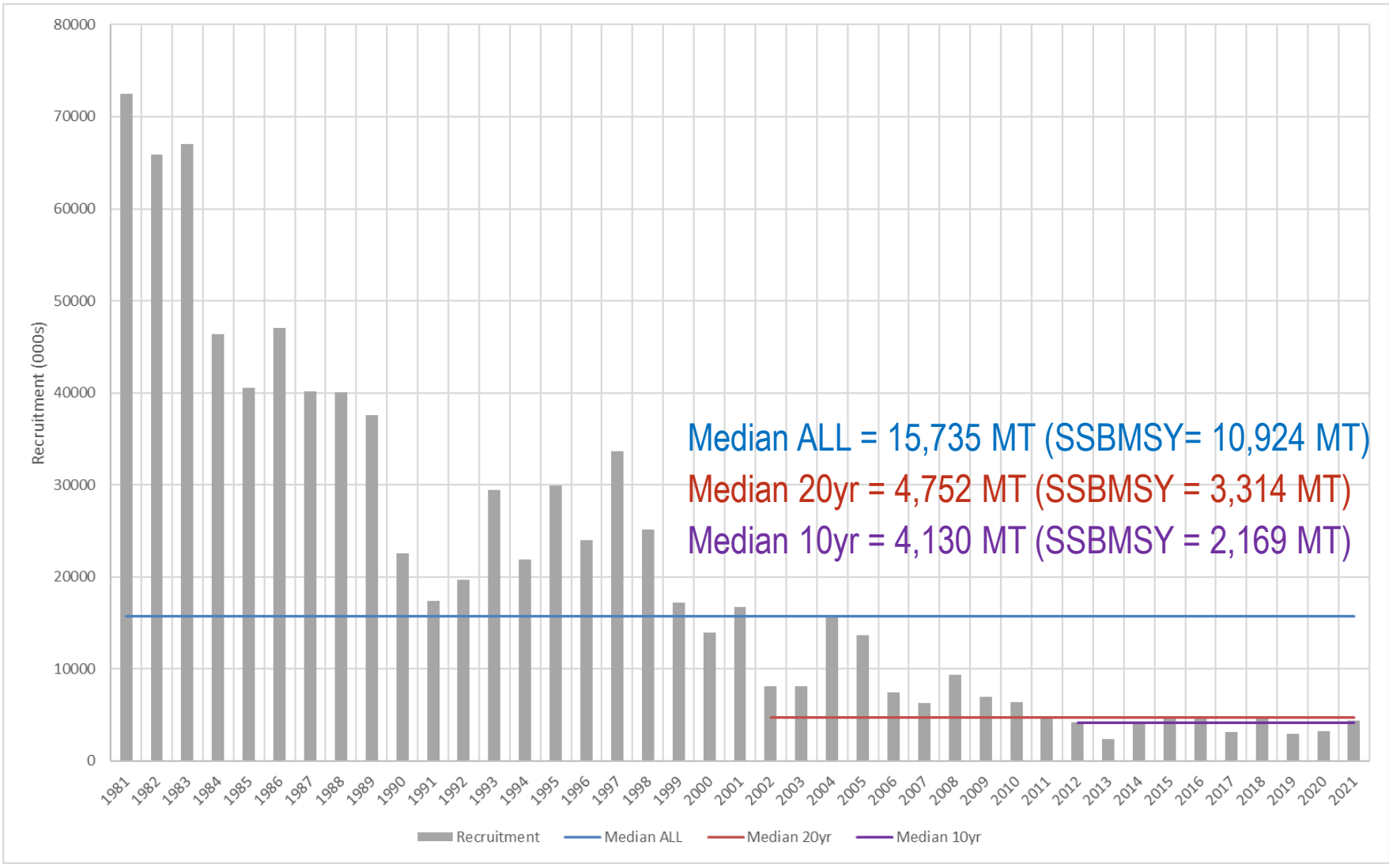


- FMSYproxy = F40% = 0.265

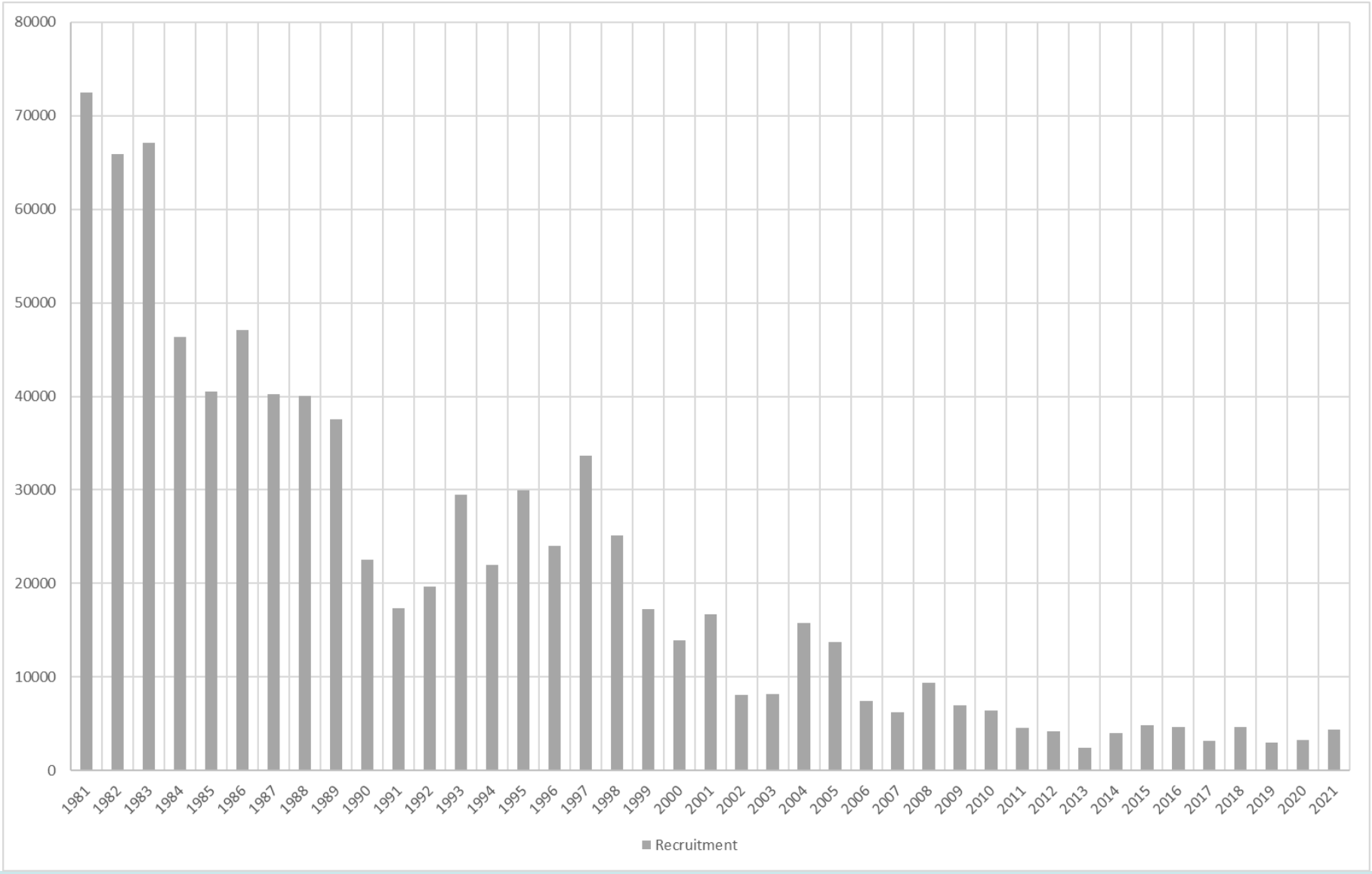
2022 MT SSBMSY

- Current SSBMSY projection methodology uses recruitment from the entire time-series (1981-2021)
- Move to a more recent stanza for recruitment that is more reflective of the current stock productivity

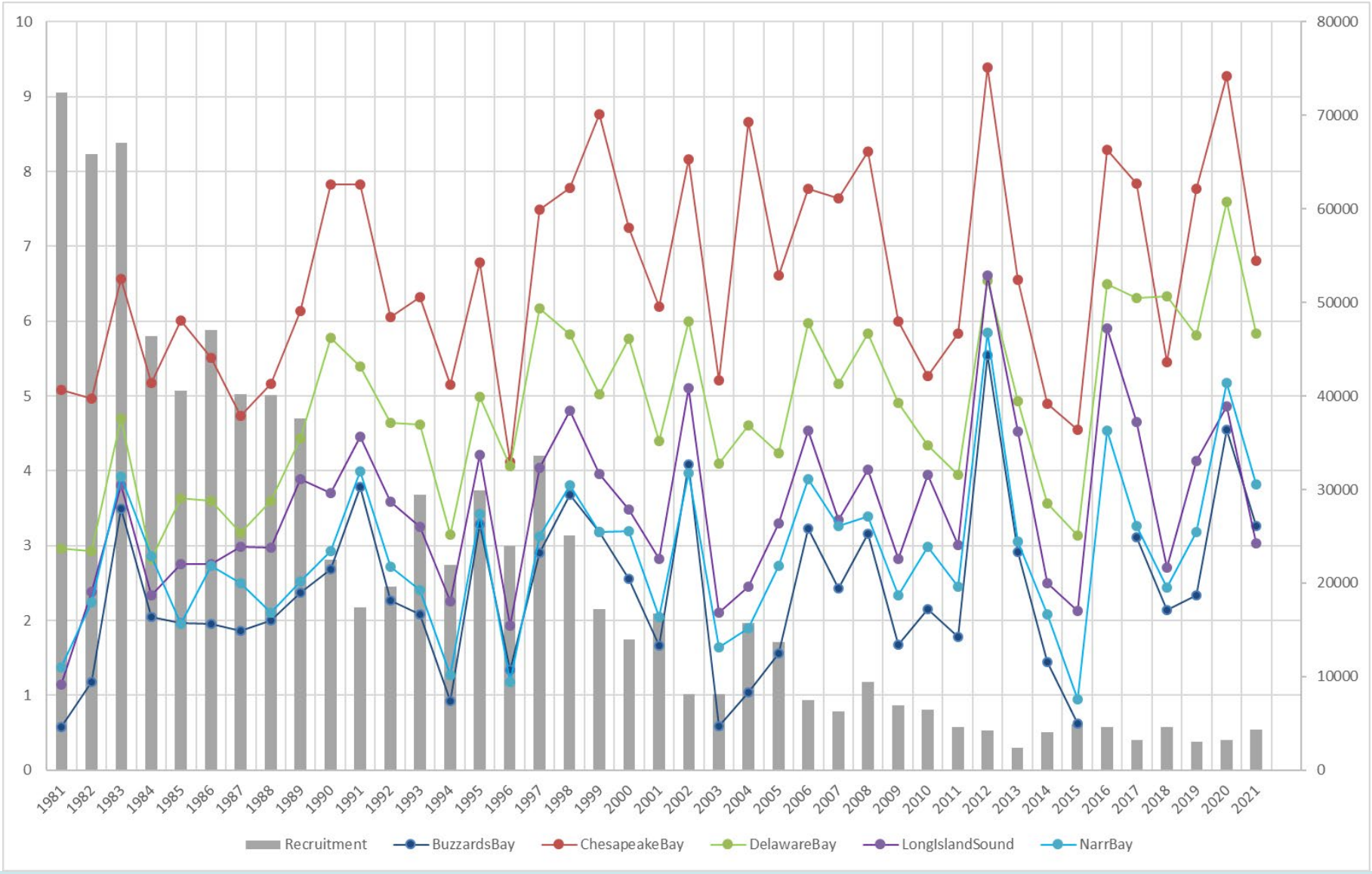
SNEMA winter flounder recruitment



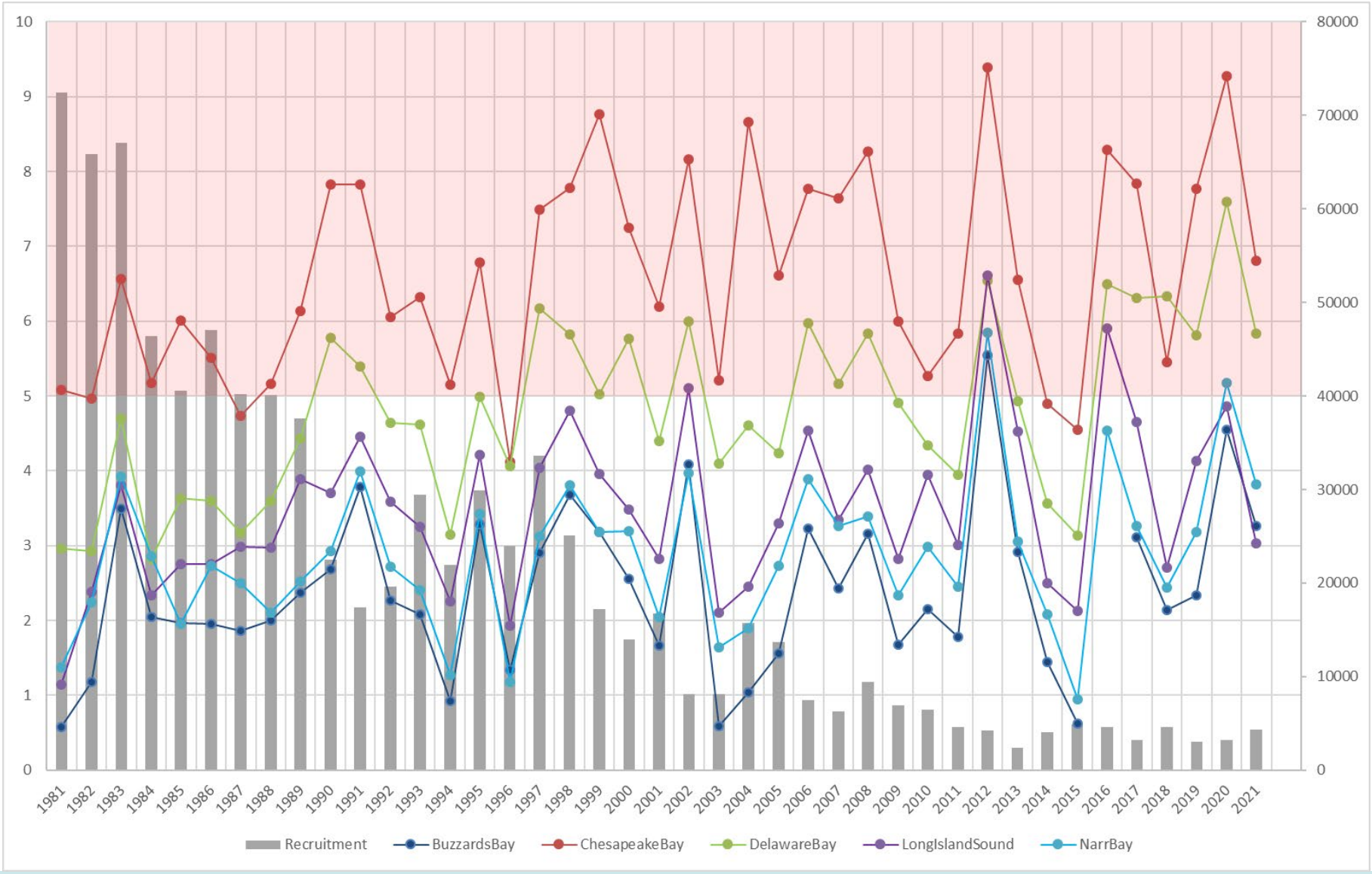
Recruitment and mean winter estuary temperature



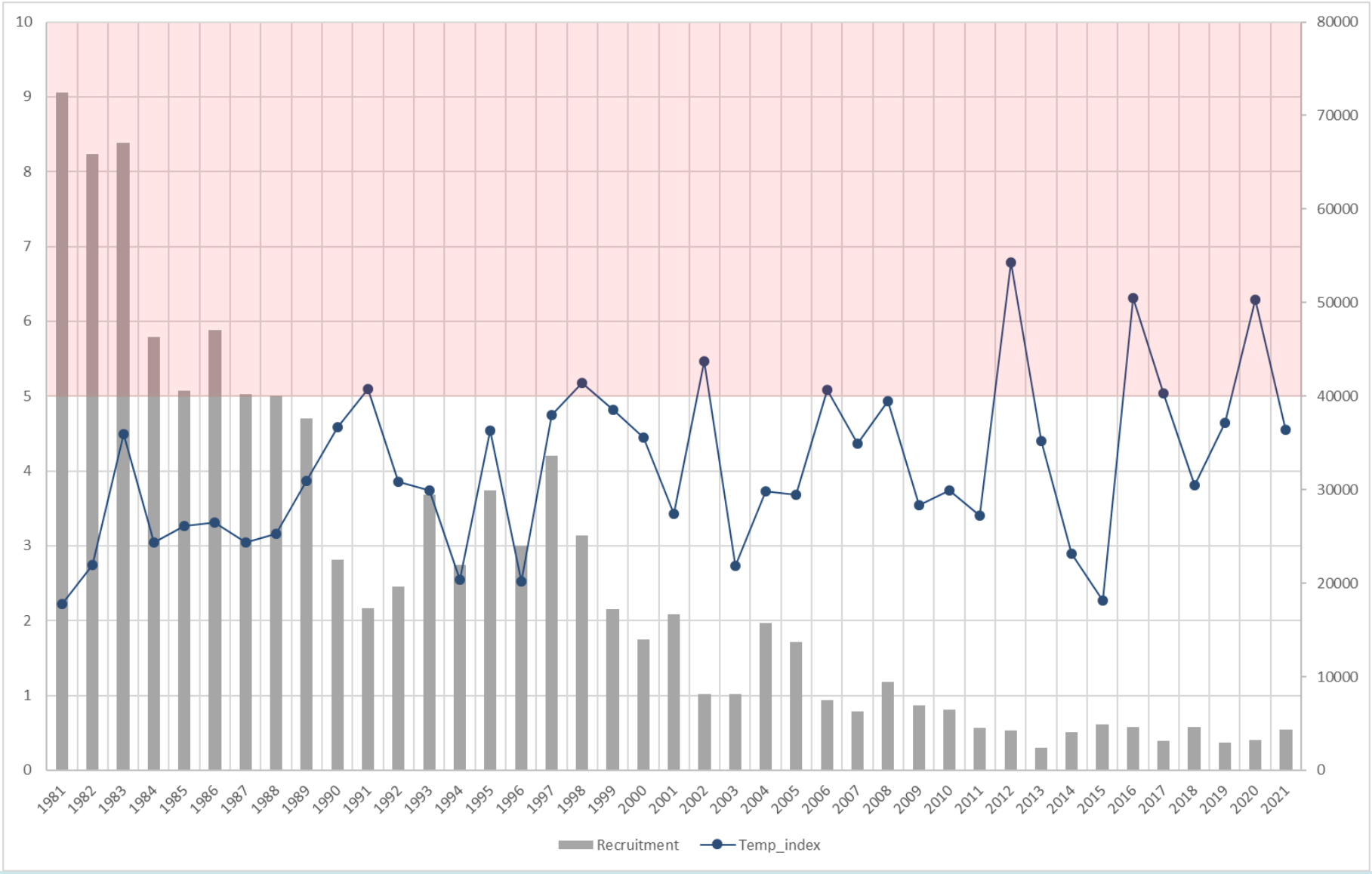
Recruitment and mean winter estuary temperature



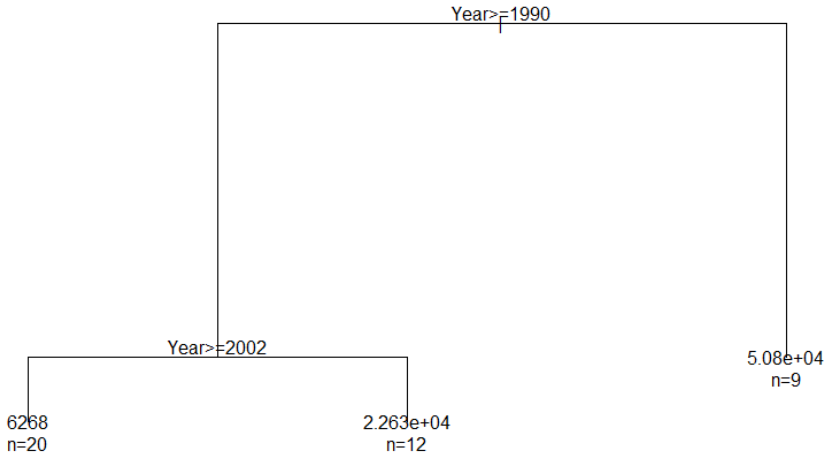
Recruitment and mean winter estuary temperature



Recruitment and mean winter estuary temperature



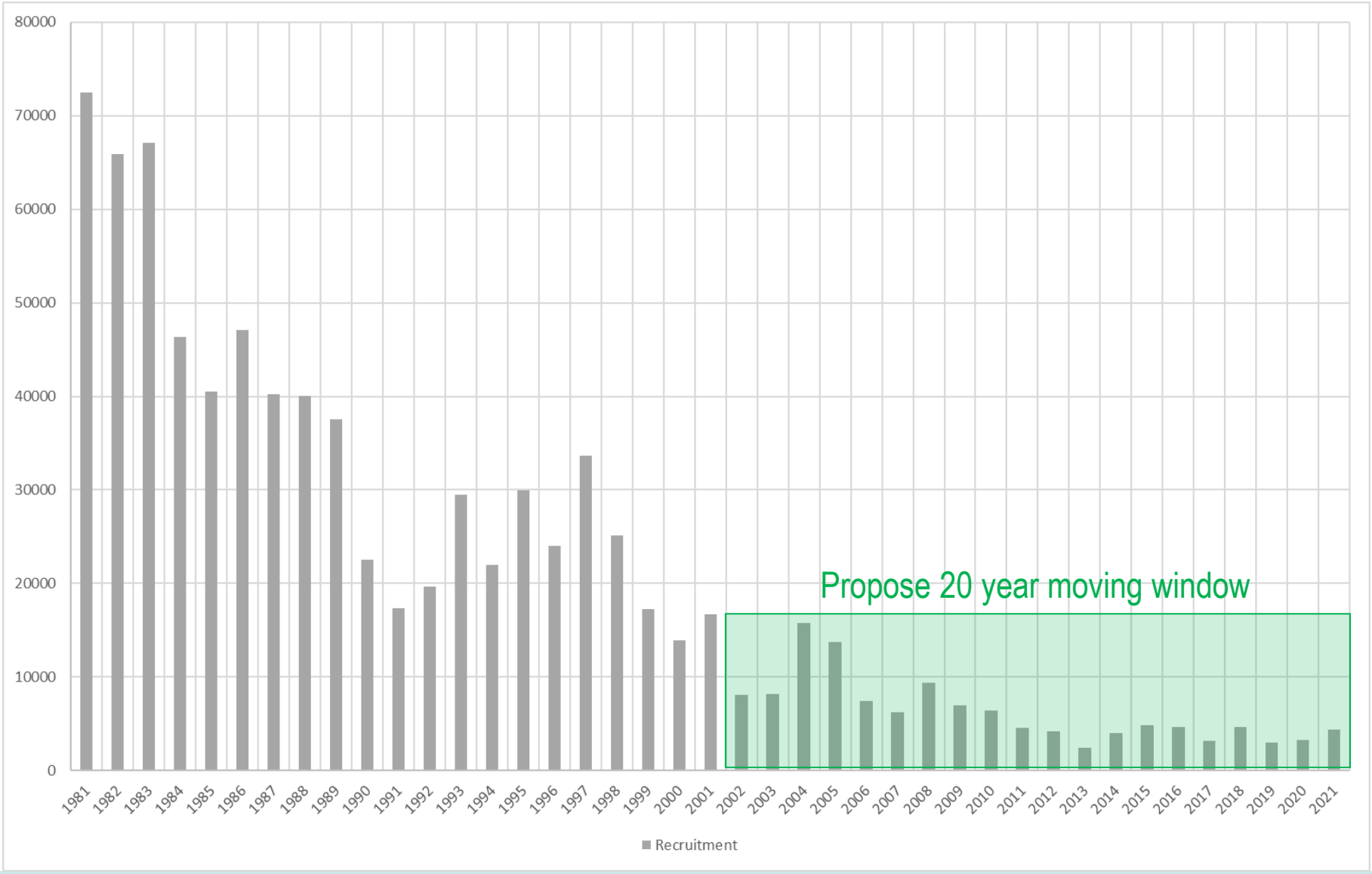
Recruitment: Regression tree



Choosing a recruitment stanza

- Temperature index has crossed over 5 degree level 6 times in past 20 years (30%), 4 times in past 10 (40%)
- Possible if we see stable or cooler winter temperatures for stock to achieve recruitment levels from early 2000's
- Recursive partitioning using regression tree suggests a split in recruitment time-series at 1990 and 2002
- Propose using the last 20 years of recruitment
- Propose using a moving window of 20 year recruitment going forward

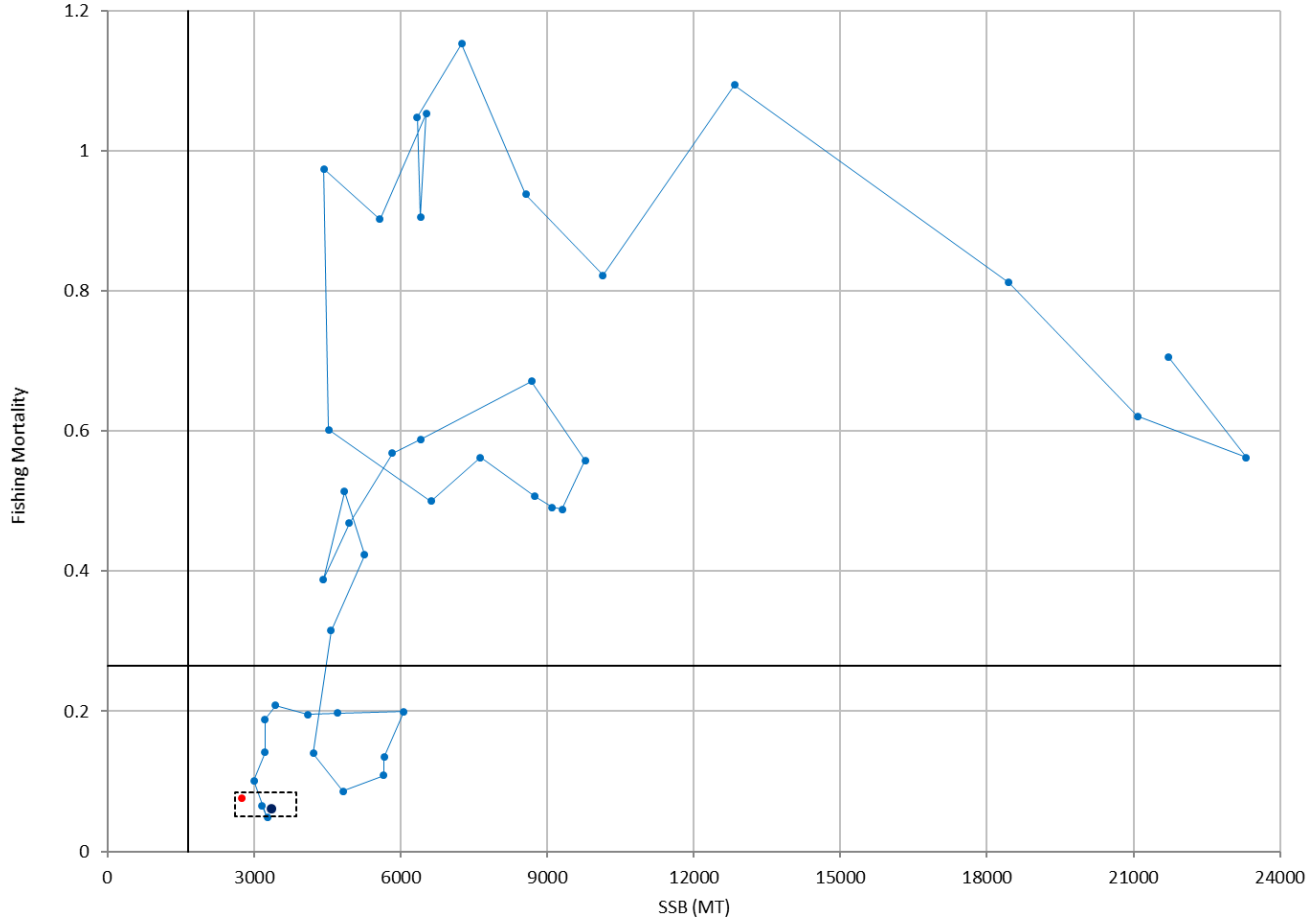
Recruitment 1981-2021



2022 update Reference Points

- F2021 = 0.061, SSB2021 = 3,353 mt
- F40%= FMSY = 0.265 (Fthreshold)
- SSBMSY = 3,314 mt (Btarget)
- ½ SSBMSY = 1,657 mt (Bthreshold)
- MSY = 1,025 mt
- F2021/Fthreshold = 23%, SSB2021/SSBtarget = 101%, SSB2019/SSBthreshold = 202%

Current Stock Status



- Status changed: not overfished, overfishing not occurring
- Minor retrospective bias, no adjustment made

TOR 5: Conduct short-term stock projections

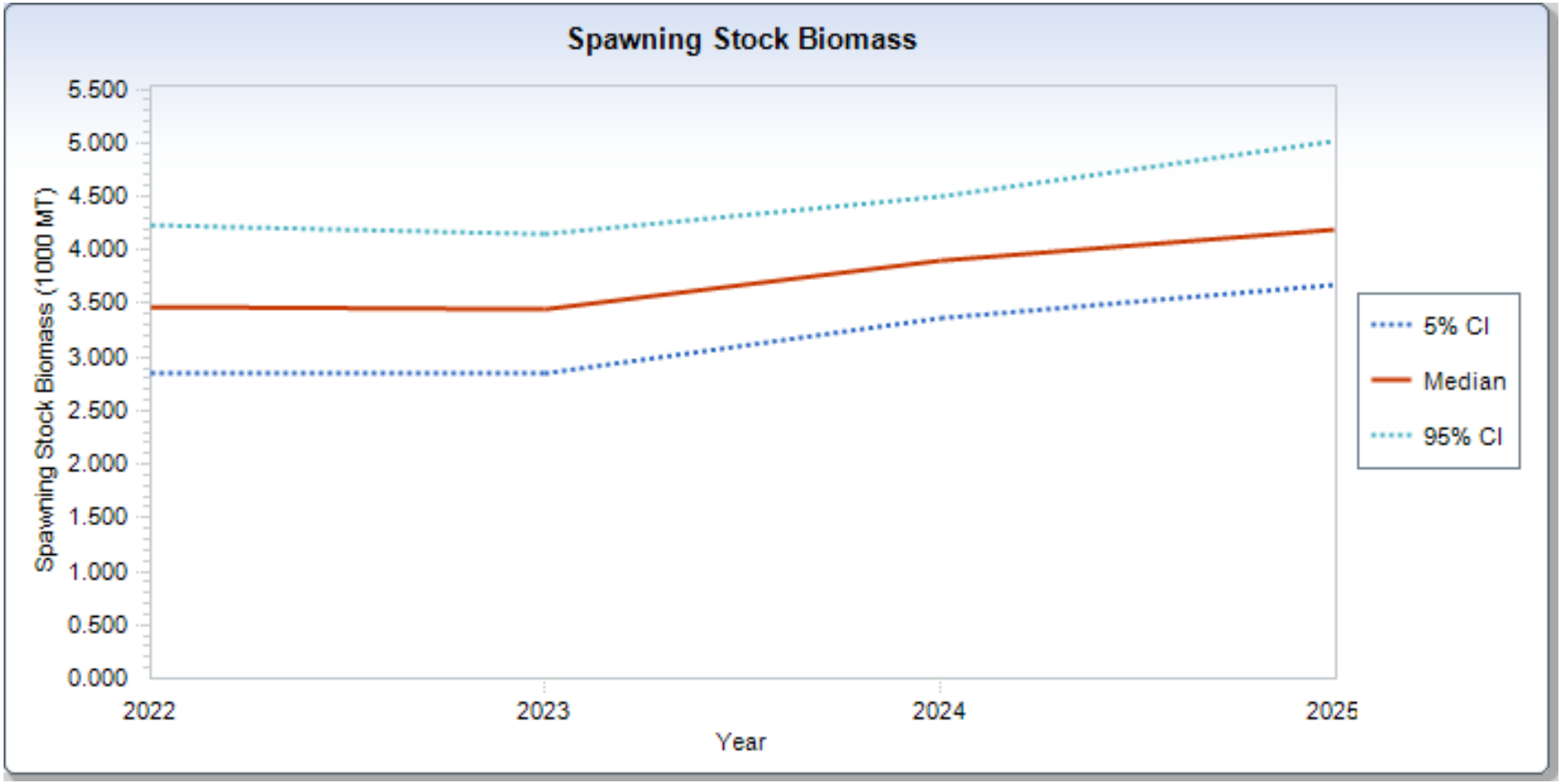
Projection at FMSY (0.265), 2022 catch = 441 MT

- Assume catch in 2022 = 441 MT (2022 ACL)
- Minor retrospective bias, no adjustment made
- 5-yr avg weights and fishery selectivity
- Project FMSY (F40%) for 2023-2025
- Recruitment from CDF empirical R (2002-2021)
- Groundfish PDT will revisit final projections

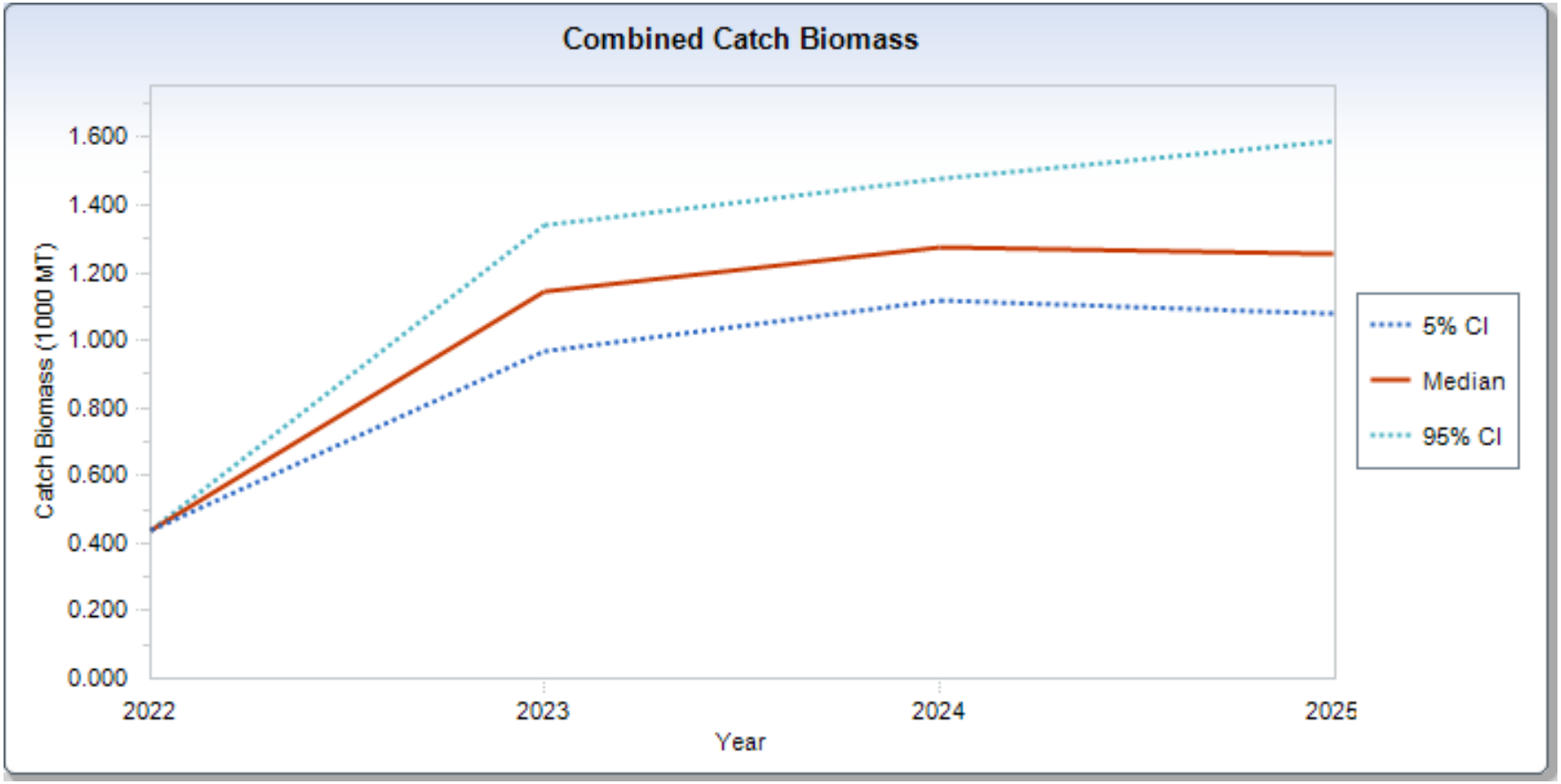
Year	Catch (mt)	SSB (mt)	F_{Full}
2022	441	3,472 (2,859 - 4,222)	0.114

Year	Catch (mt)	SSB (mt)	F_{Full}
2023	1,142	3,447 (2,845 - 4,156)	0.265
2024	1,276	3,894 (3,367 - 4,491)	0.265
2025	1,256	4,186 (3,666 - 5,011)	0.265

Projection at FMSY (0.265), 2022 catch = 441 MT



Projection at FMSY (0.265), 2022 catch = 441 MT



TOR 6: Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment

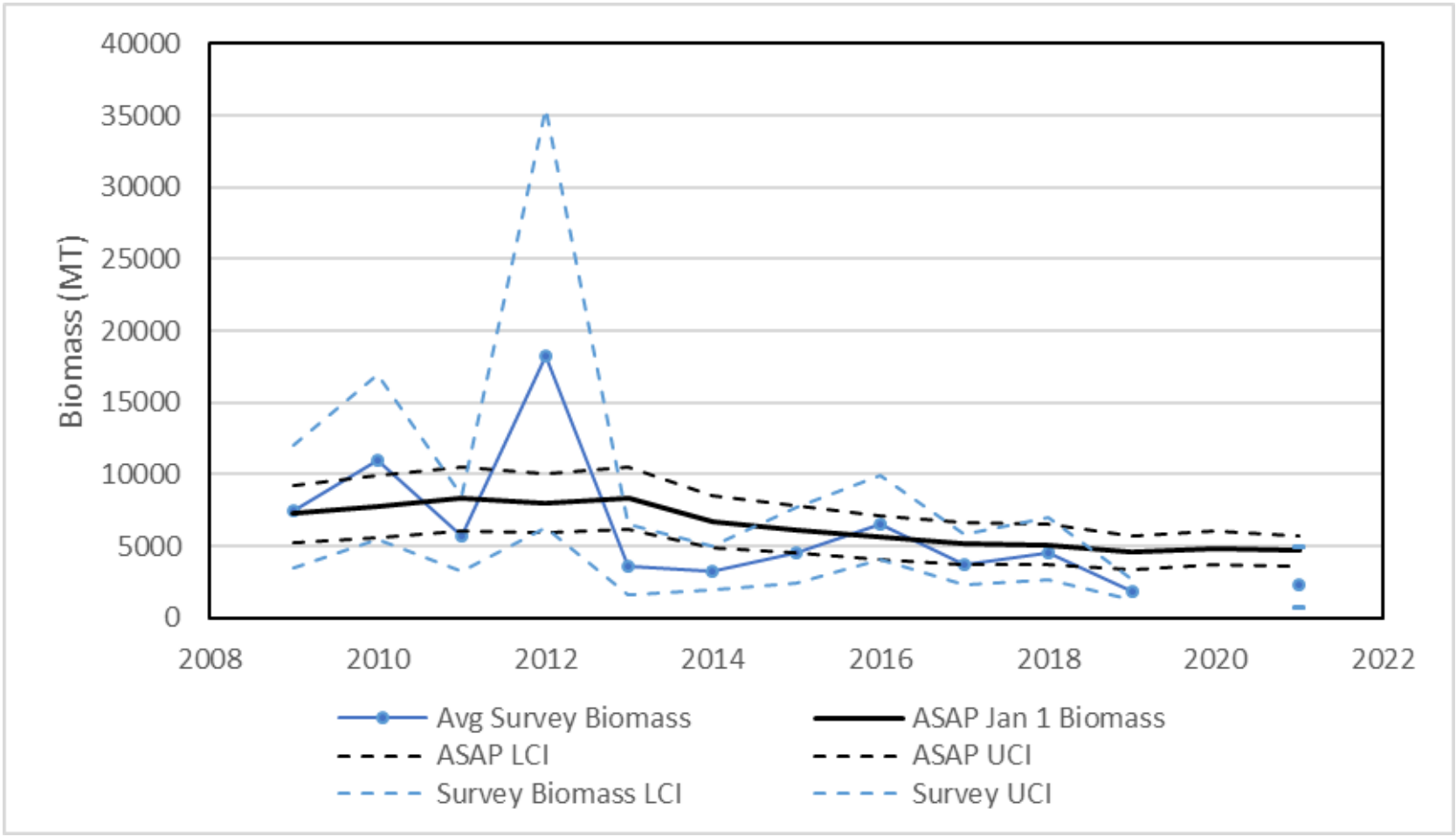
Main review panel recommendation from 2020

- …recruitment had been declining throughout the period and was currently very low. As for several other stocks under the purview of the NEFSC it would be helpful to evaluate if the previously observed high recruitment are possible; i.e., is it simply a matter of building back *SSB* and recruits will follow, or are there other factors at play. If the productivity of the resource(s) has decreased, it would be helpful to adjust reference points accordingly. This would be unlikely to change fisheries yield much but would be more realistic in terms of setting expectations.

Research Needs

- Additional studies on maximum age
- Additional sources for maturity information
- Update and investigate migration rates between stock and movement patterns. The most recent comprehensive tagging study was completed in the 1960s
- Further investigate localized structure/genetics (2018 pub)
- Incorporate environmental influence on S-R recruitment relationship, mortality, and/or survey catchability ($ASAP_E$ Bell et al 2018 and WHAM)

Survey Biomass vs Model Total Biomass



Questions?