



SEDAR 79: Mutton Snapper

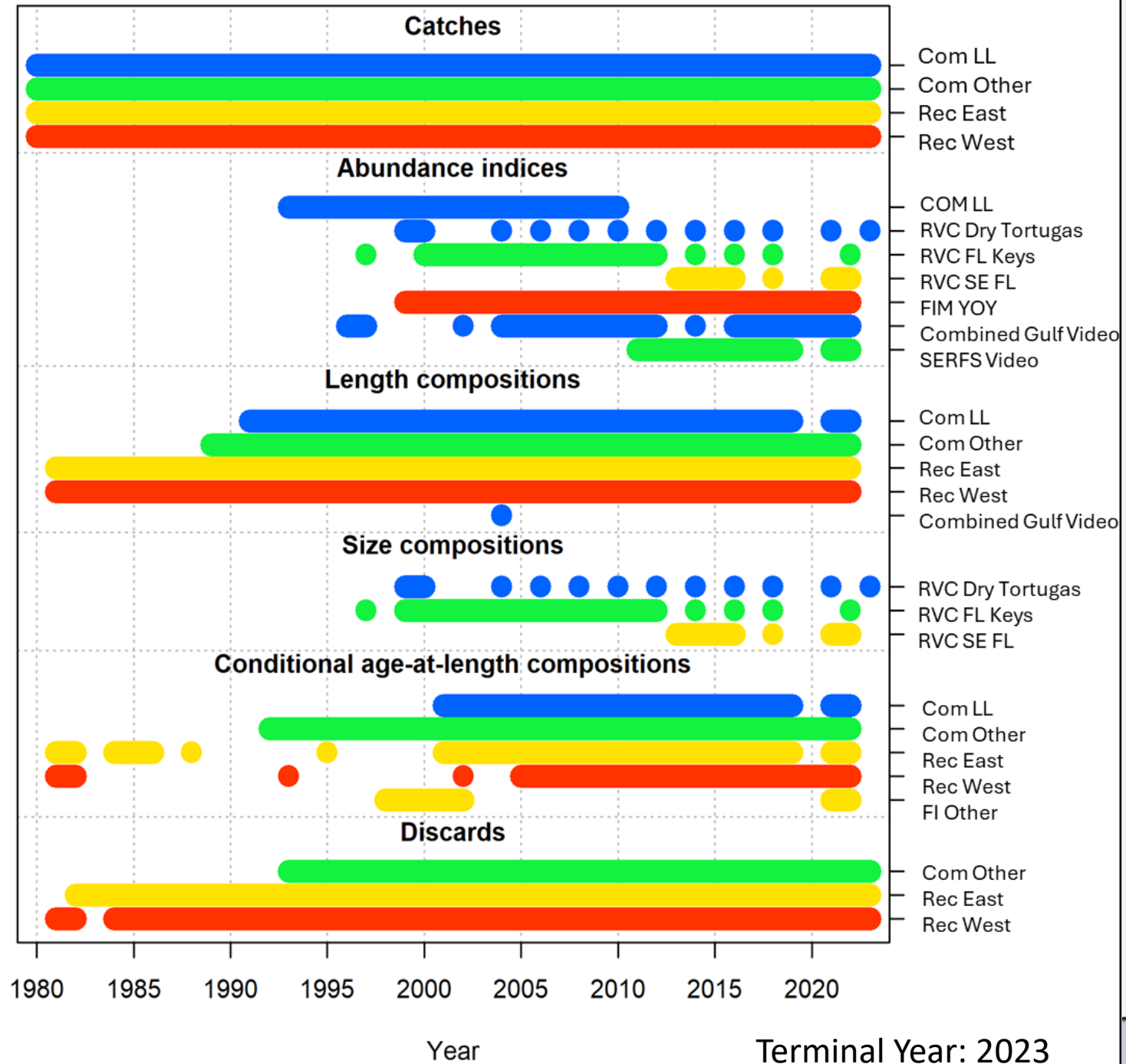
Reef Fish AP Review

Ryan Rindone for:

FWRI Stock Assessment Group, St. Petersburg, FL

March 17, 2025





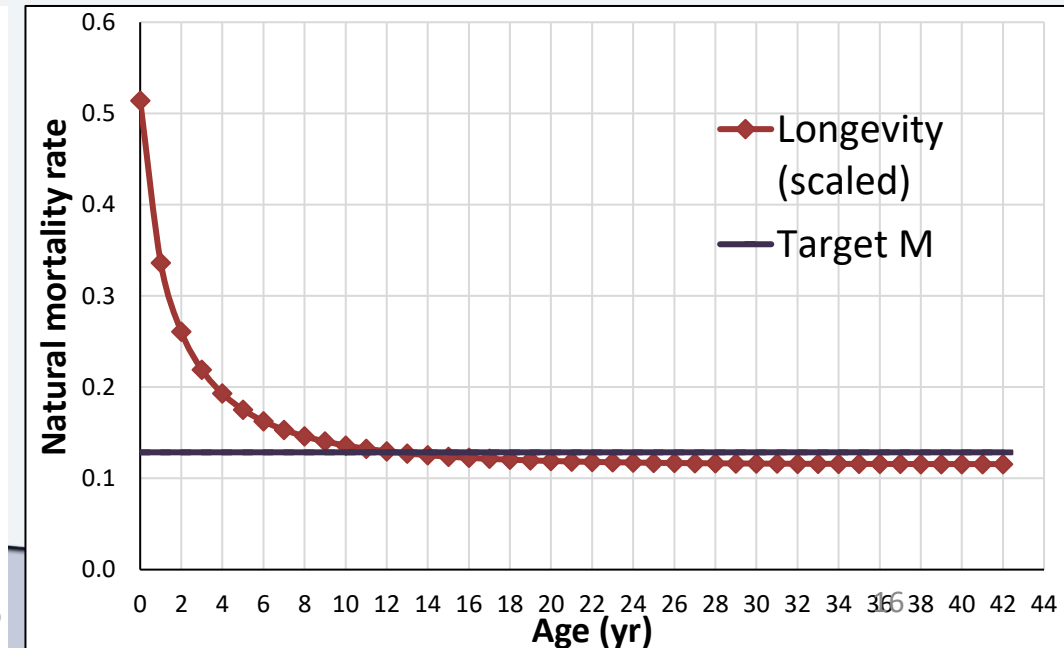
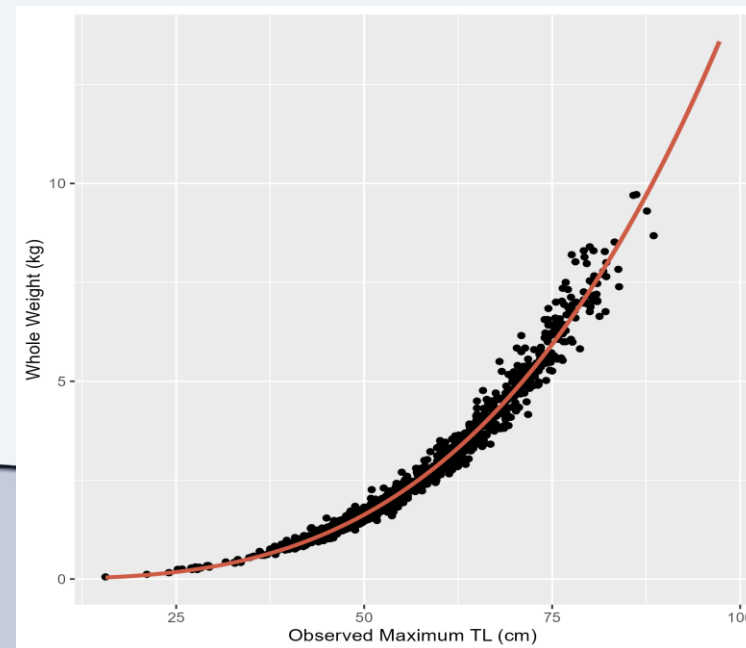
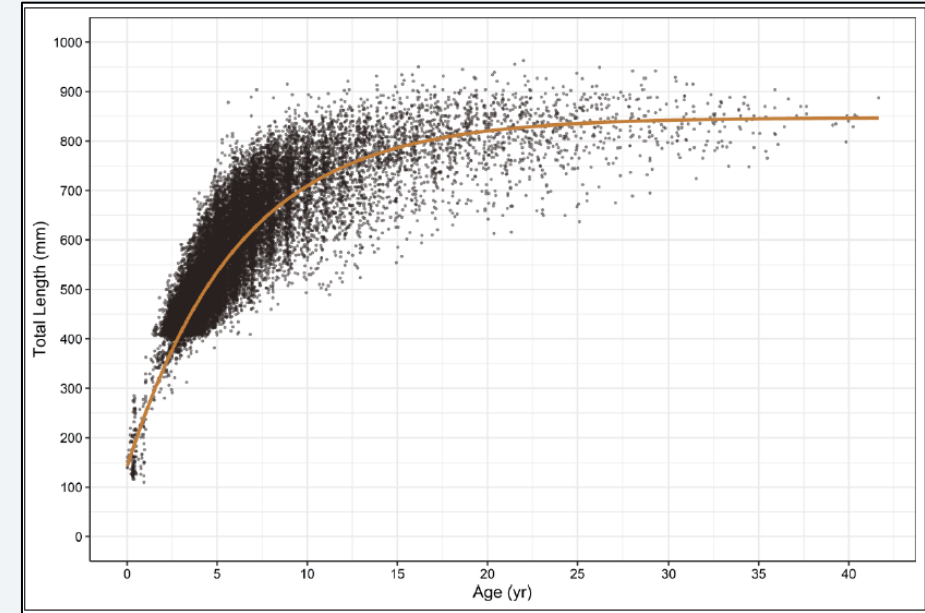
Unit Stock Definition

- Genetically, same stock
- Florida Current may serve as an effective barrier to recruitment to the Florida Keys and Southeast Florida from populations off Cuba and other parts of the Caribbean Sea
 - Assumed low genetic connectivity



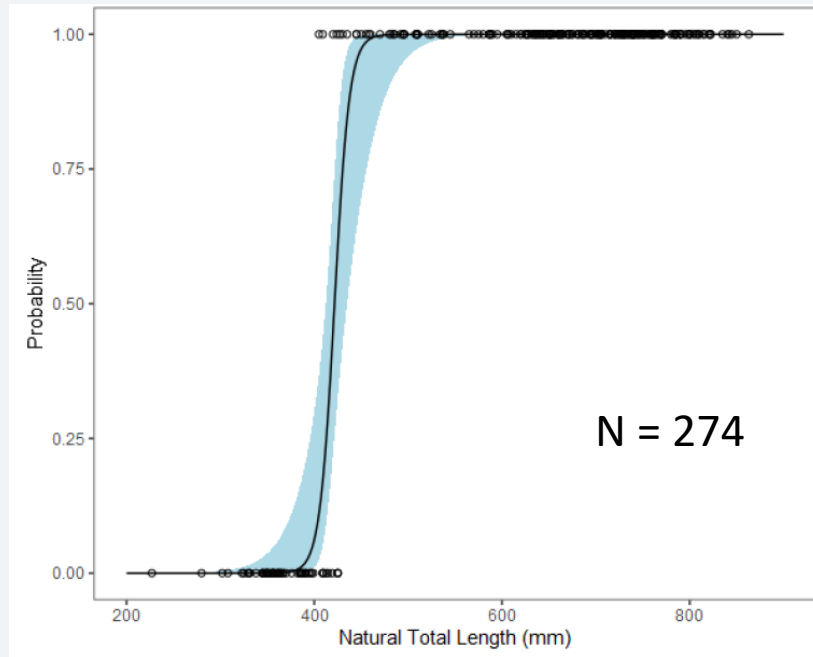
Main Data Inputs: Life History

- Initial Values for Growth
 - $L_{inf} = 847$ mm Max TL
 - 18" (45.7 cm) fish \approx 2.57 lbs (1.17 kg)
- Males and females look the same
- Natural Mortality
 - Hamel and Cope (2022) longevity-based constant M
 - $M = 0.129$
- Release Mortality
 - All Fleets: 30%
- Sex ratio 1:1

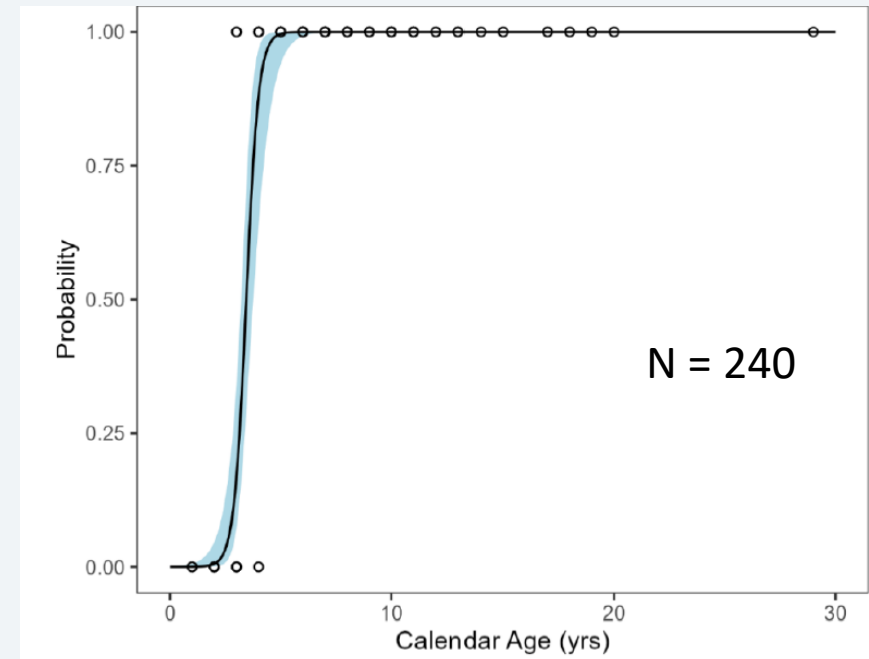


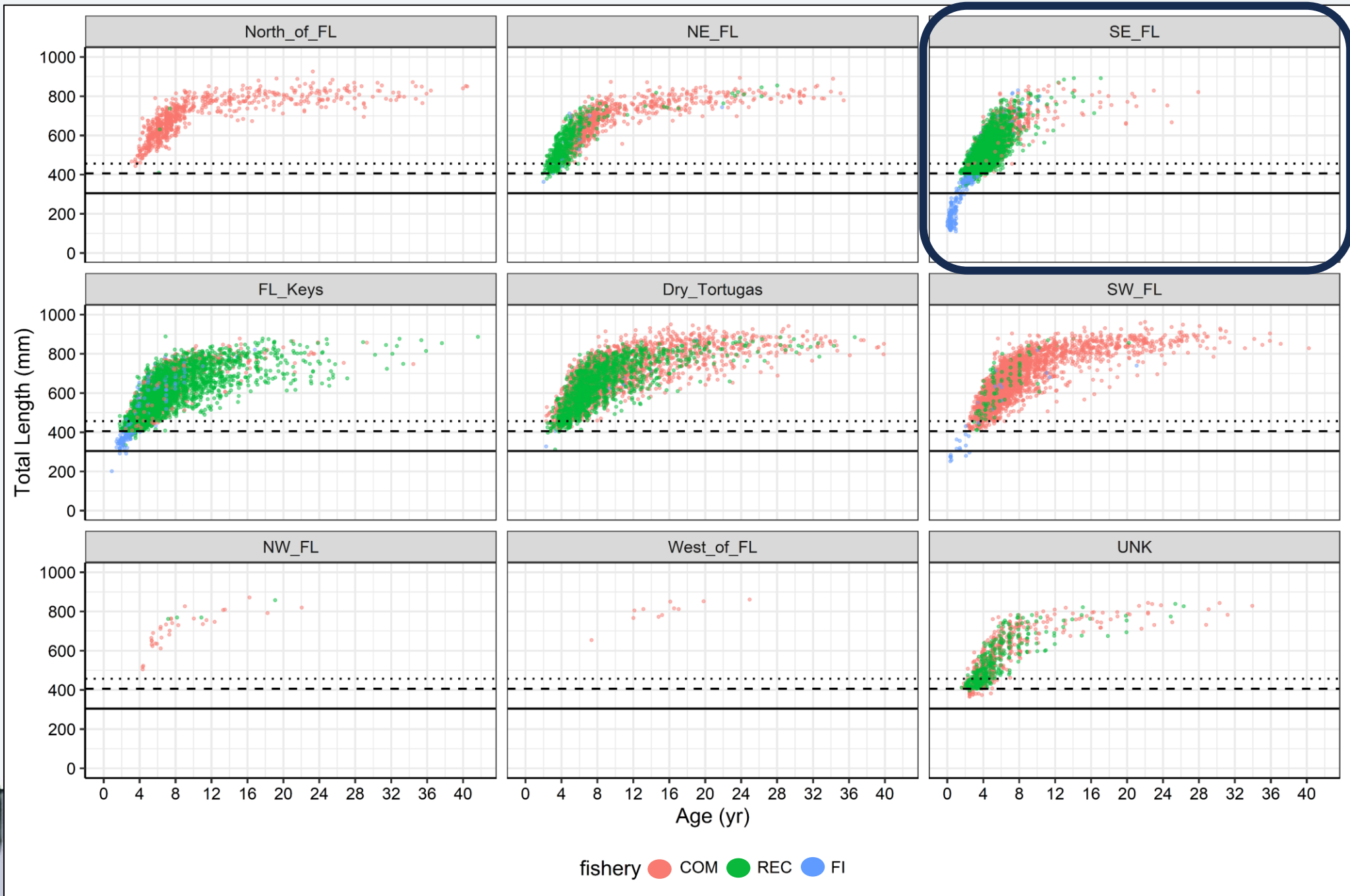
Main Data Inputs: Life History

- Size/Age at Maturity (DW-12)
- L50 = 422 mm natural TL; se = 198 mm



- A50 = 3.5 years; se = 1.1 years





Base Model Fleet Configuration

- Commercial Longline – includes all regions
- Commercial Other – includes all regions
- Rec East – SE FL and North (includes all modes)
- Rec West – FL Keys and Gulf (includes all modes)



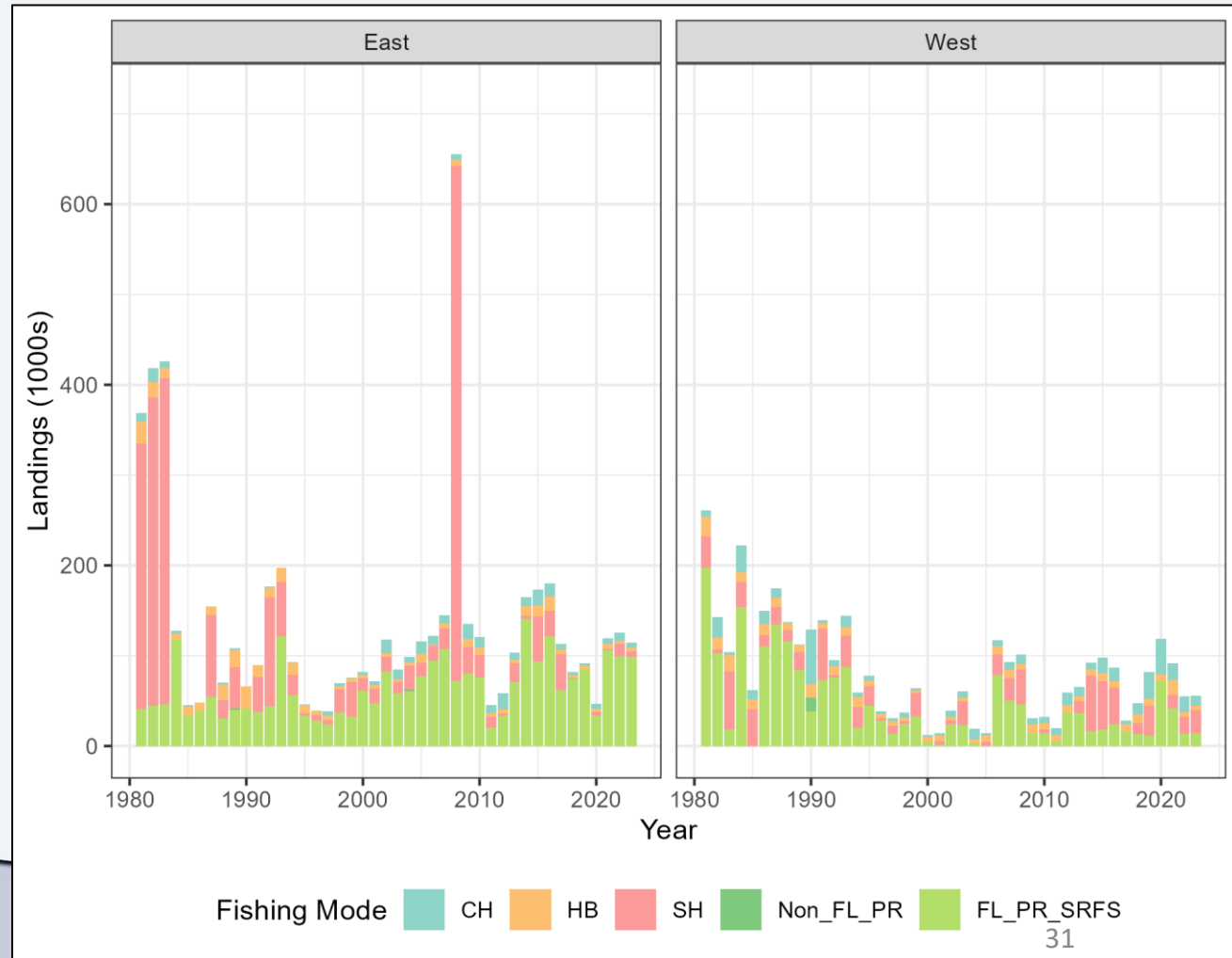
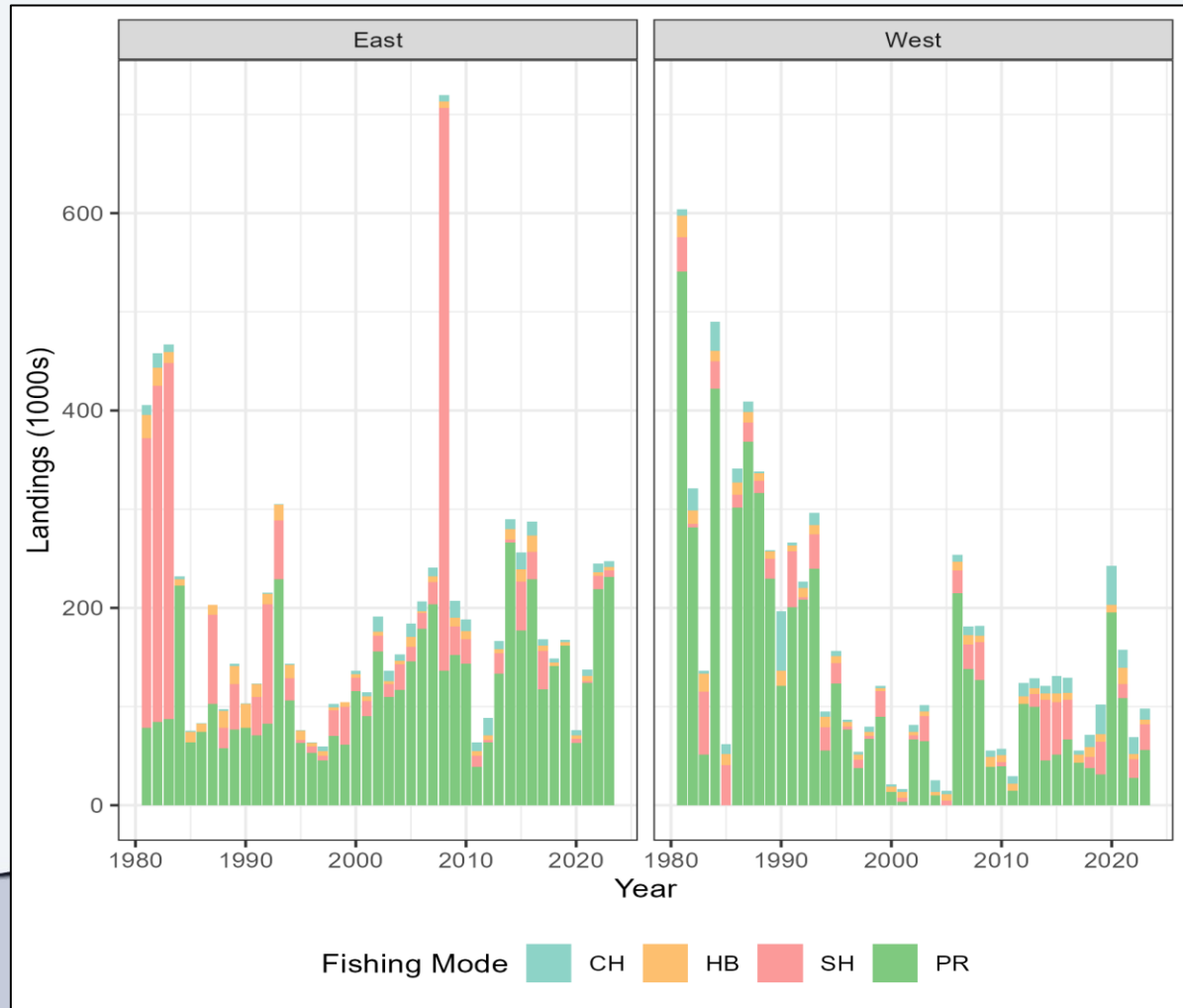
Rec data including FL State Reef Fish Survey

Rec Landings and Releases incorporating SRFS includes:

- Headboat data from SRHS
- Charter data from MRIP-FHS
- Shore mode data from MRIP-FES
- Non-FL Private mode data from MRIP-FES
- FL Private mode data from SRFS (2021-2023)
- MRIP-FES calibrated to SRFS (1981-2020)
 - SEDAR79-AP-02

MRIP-FES Landings

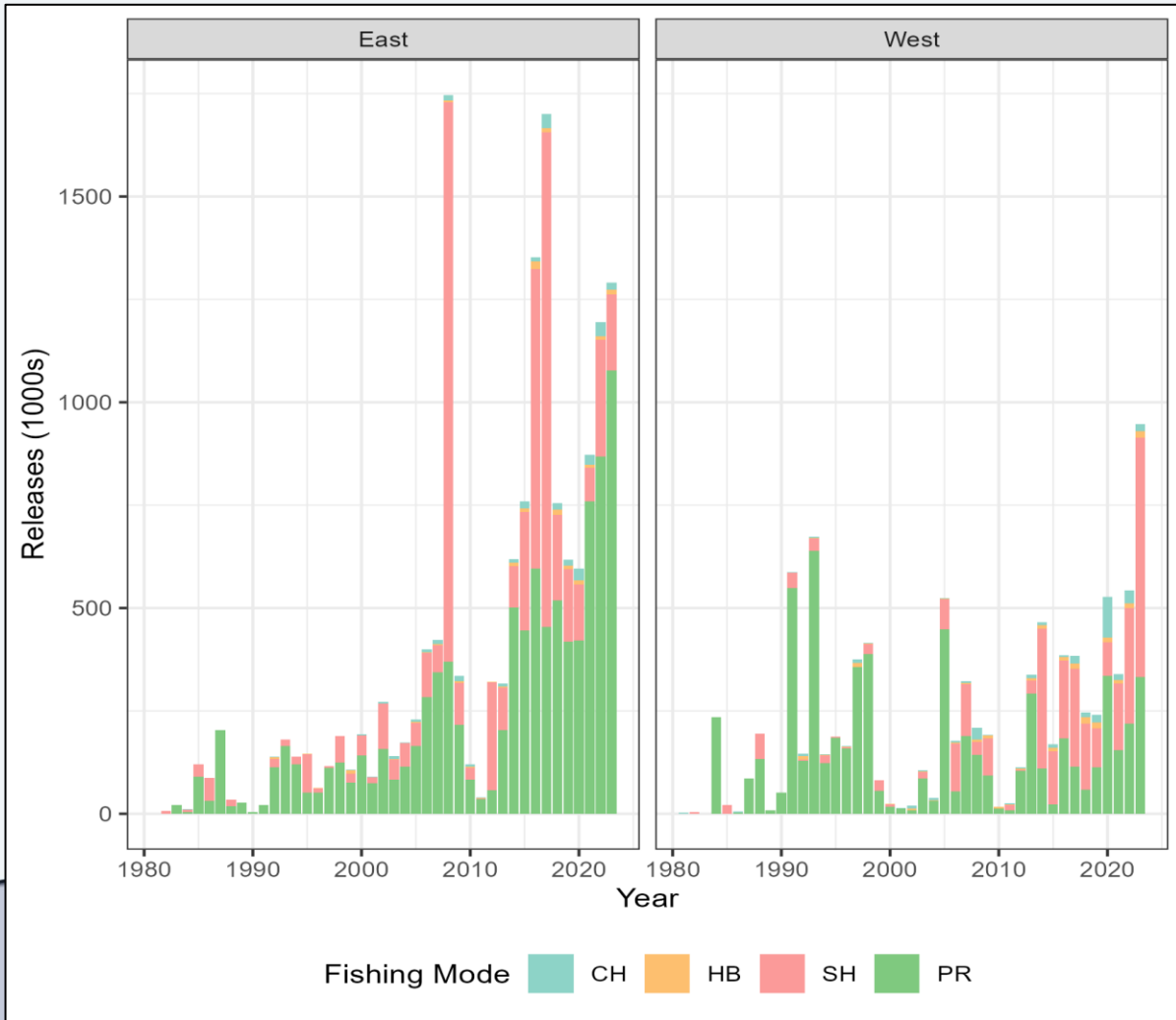
SRFS-calibrated Landings



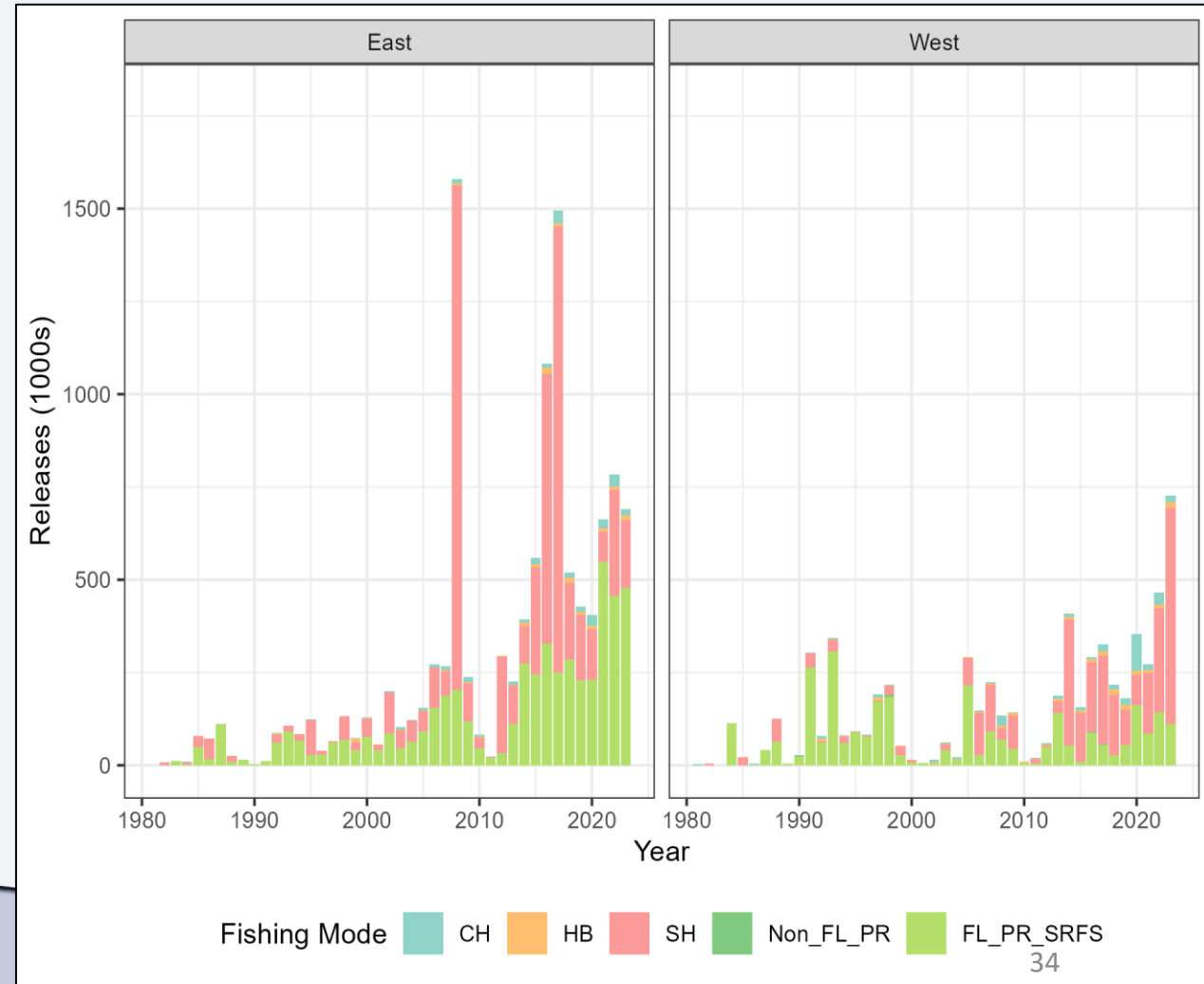
Rec Landings CVs



MRIP-FES Releases



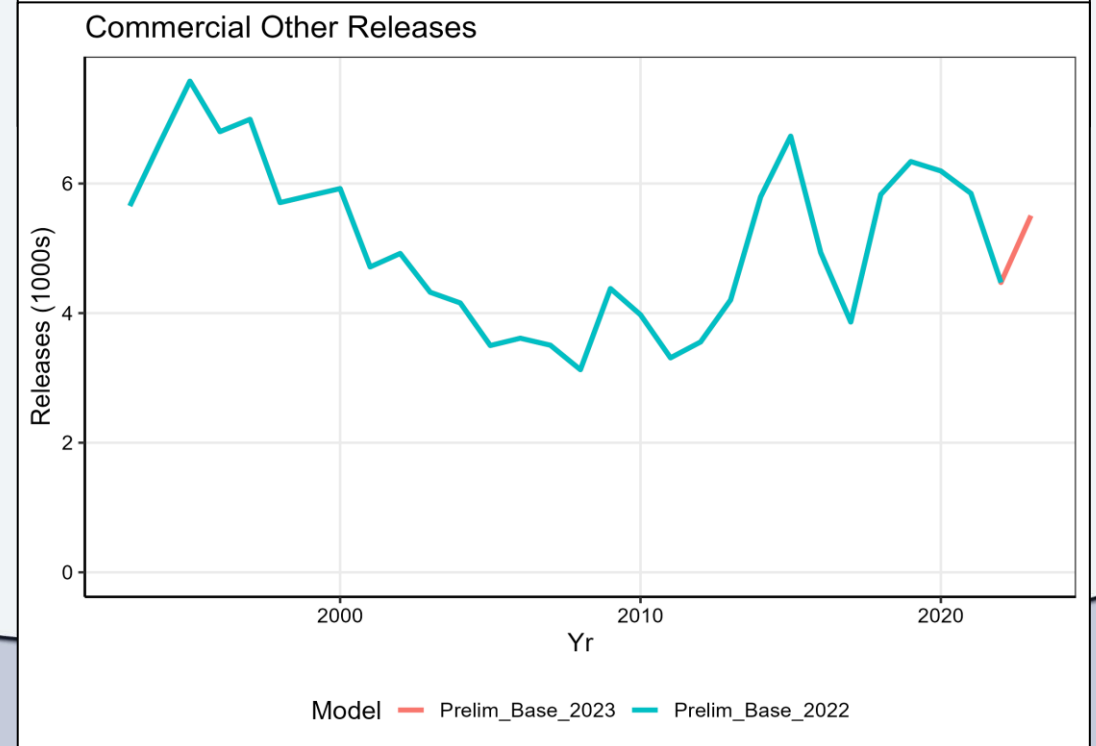
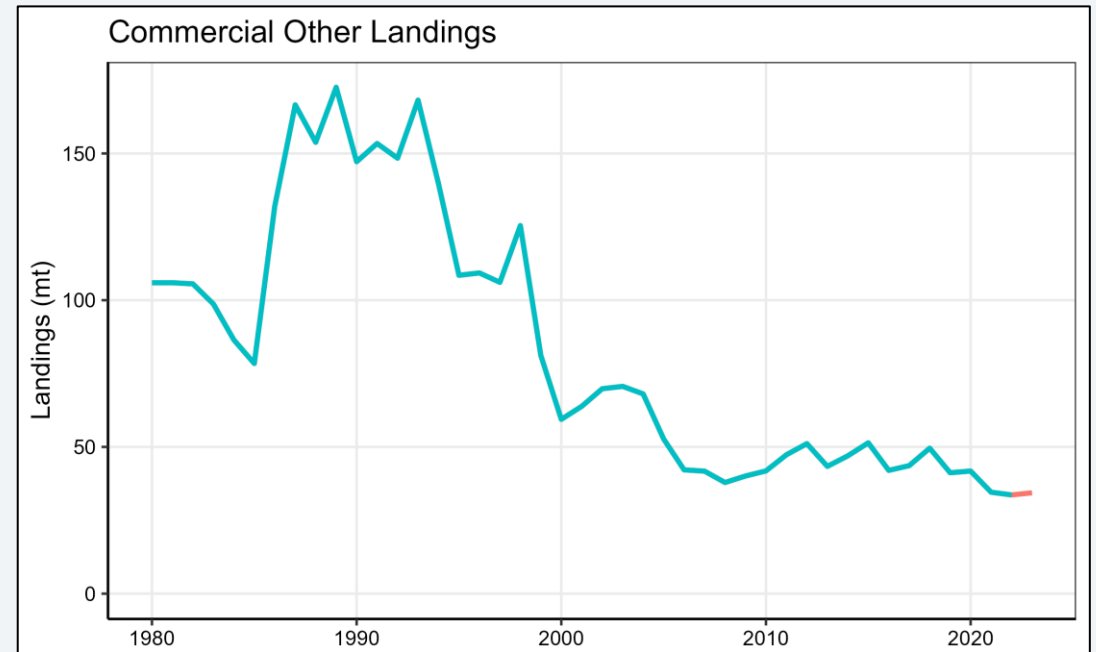
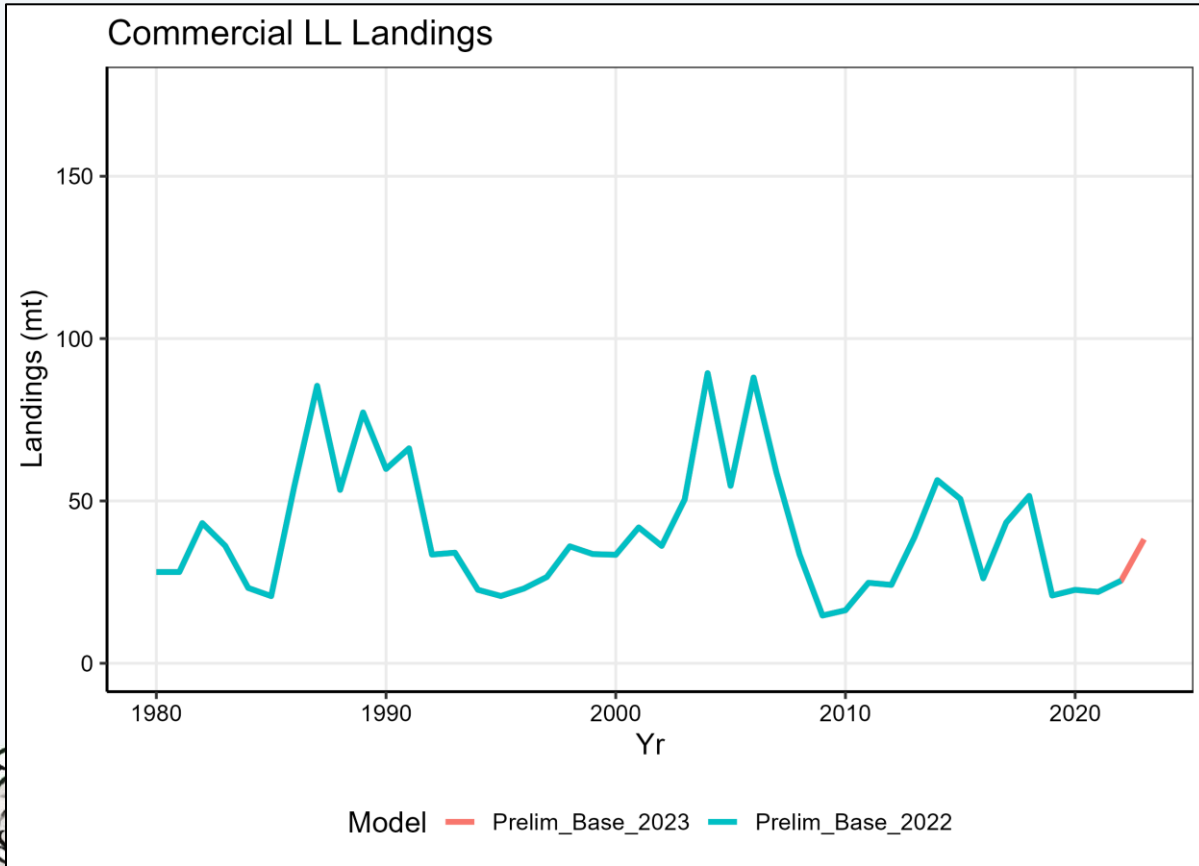
SRFS-calibrated Releases



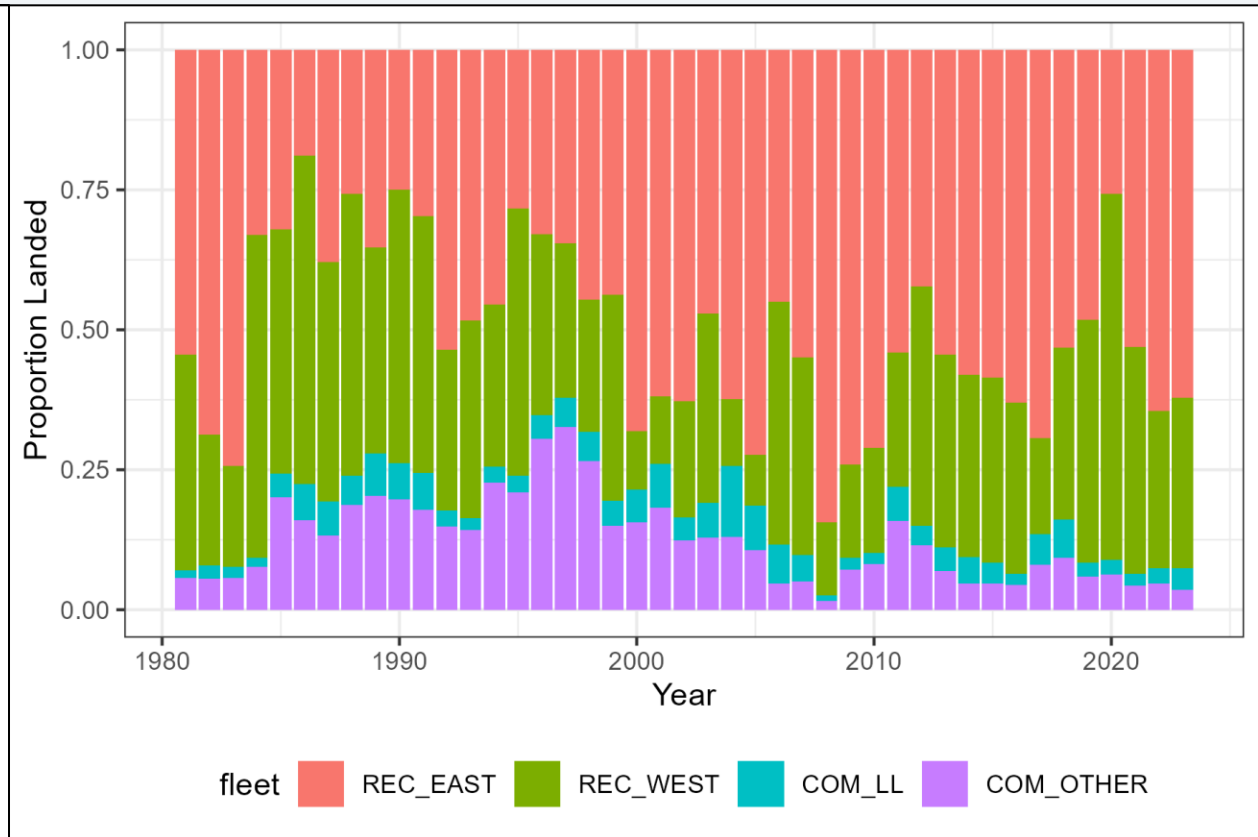
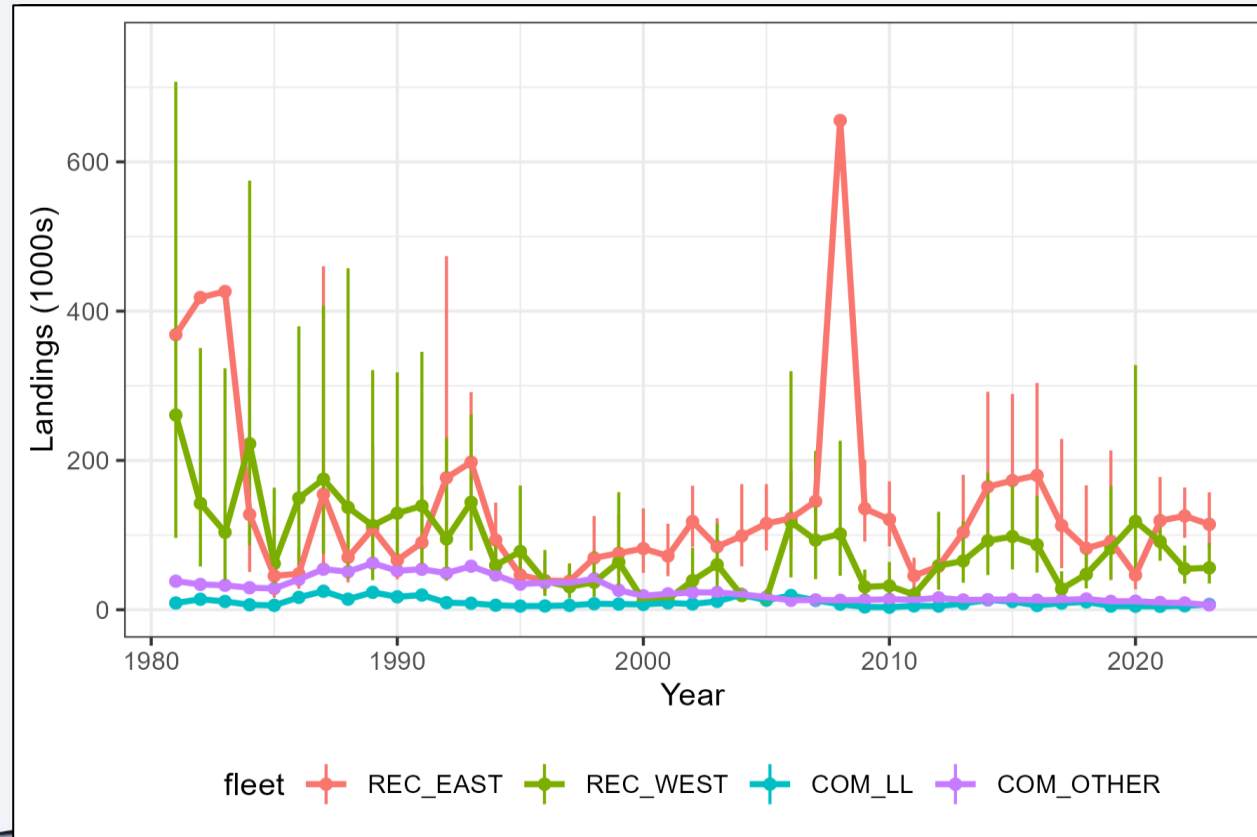
Rec Releases CVs



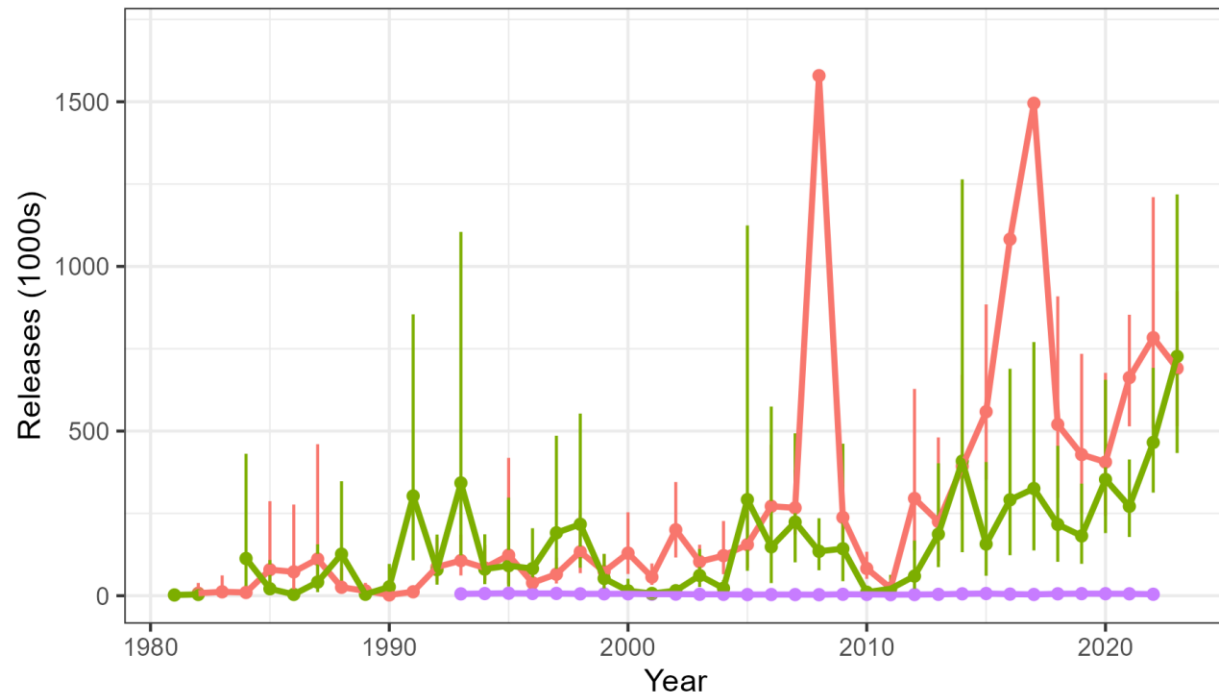
Commercial Landings and Releases



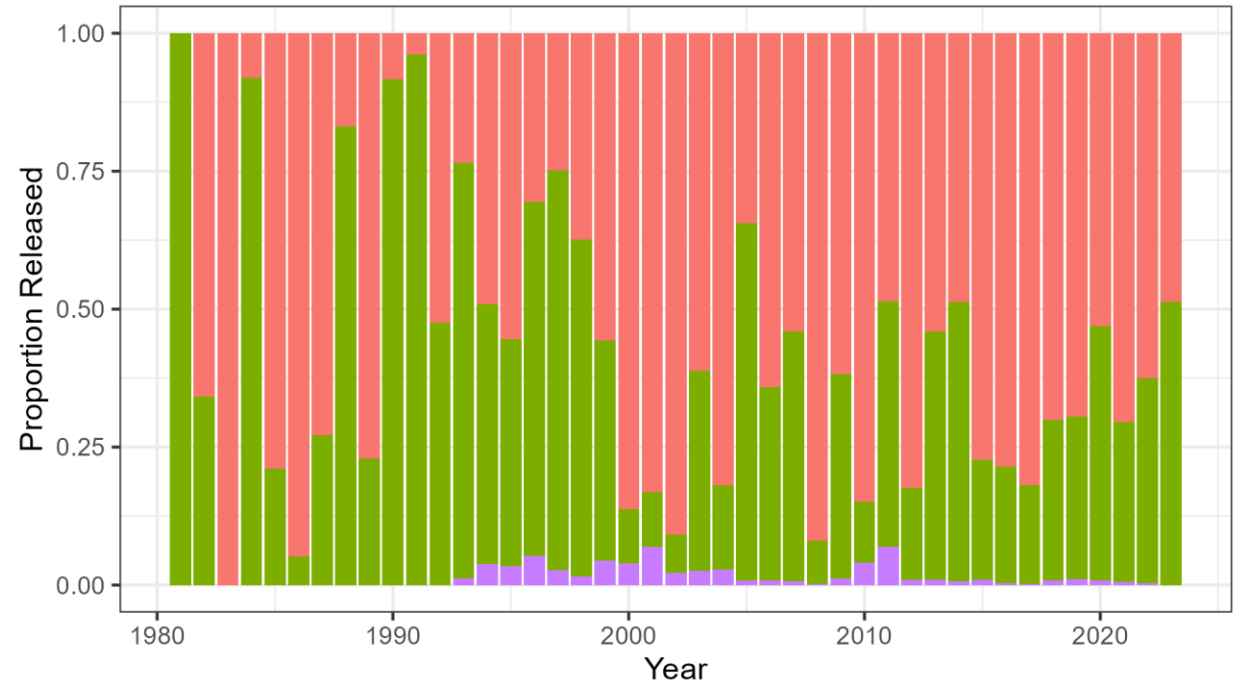
Landings (1000s) by Fleet (inc SRFs)



Releases (1000s) by Fleet (inc SRFs)



fleet REC_EAST REC_WEST COM_LL COM_OTHER

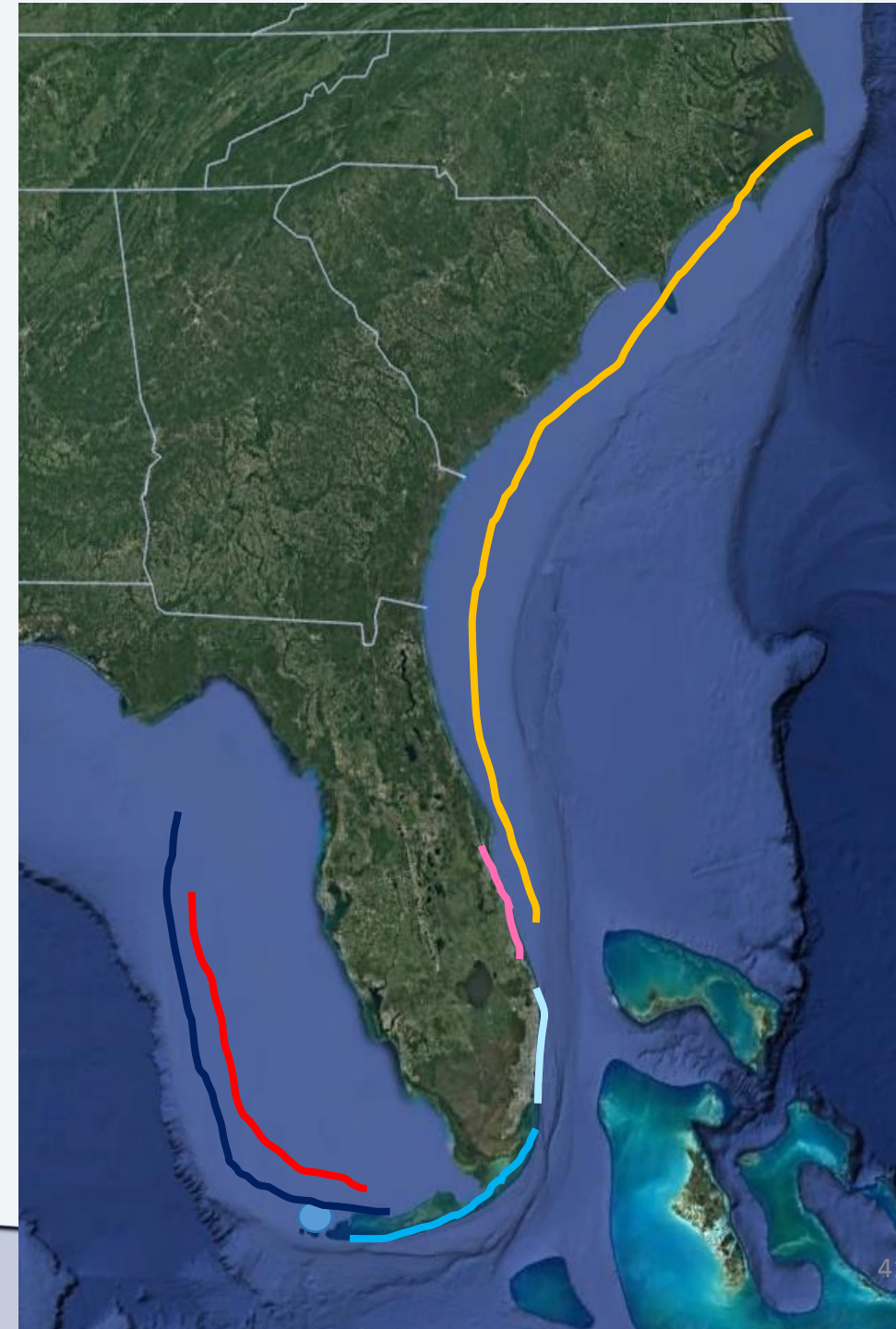


fleet REC_EAST REC_WEST COM_LL COM_OTHER

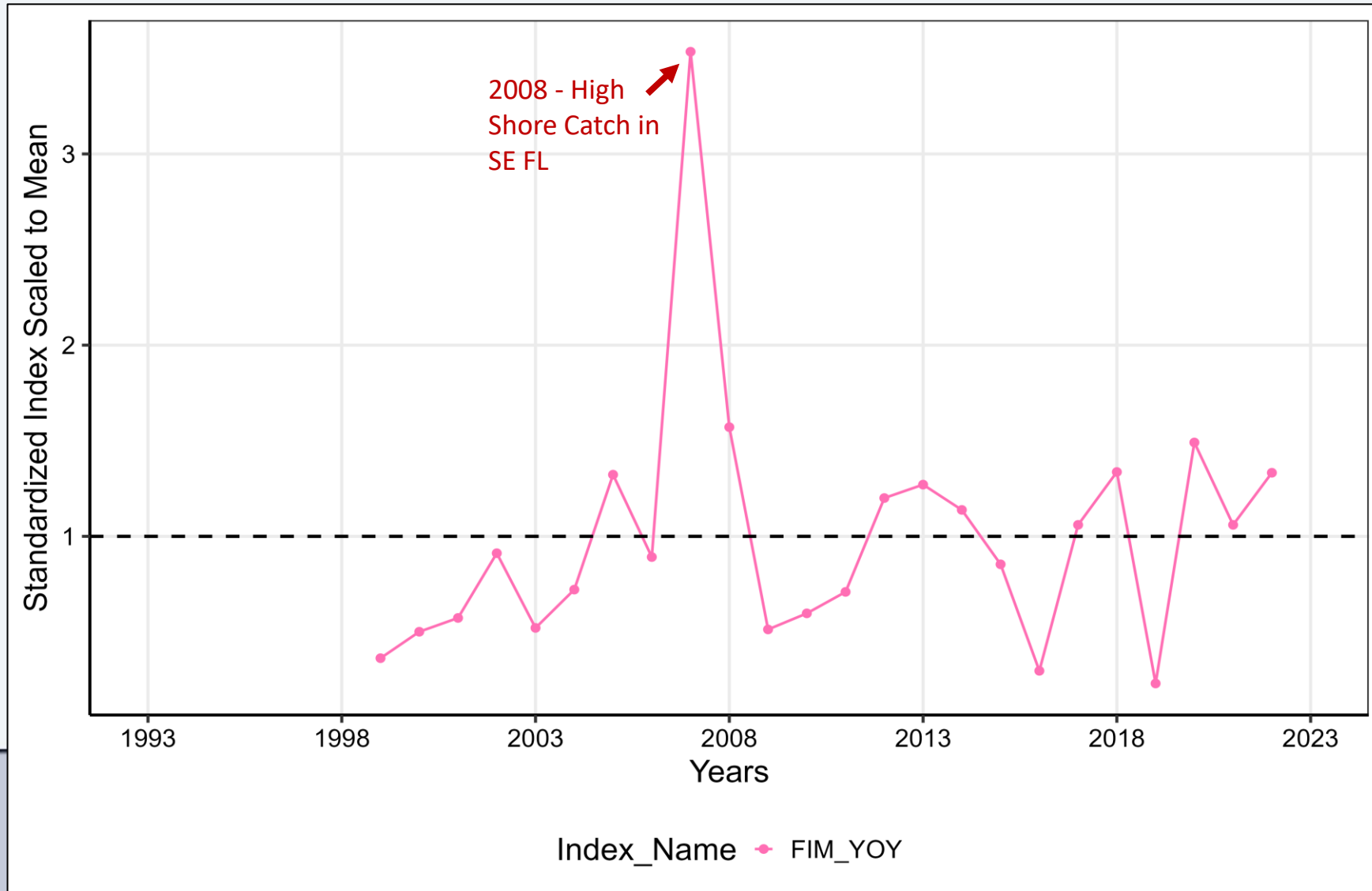


Main Data Inputs: Indices

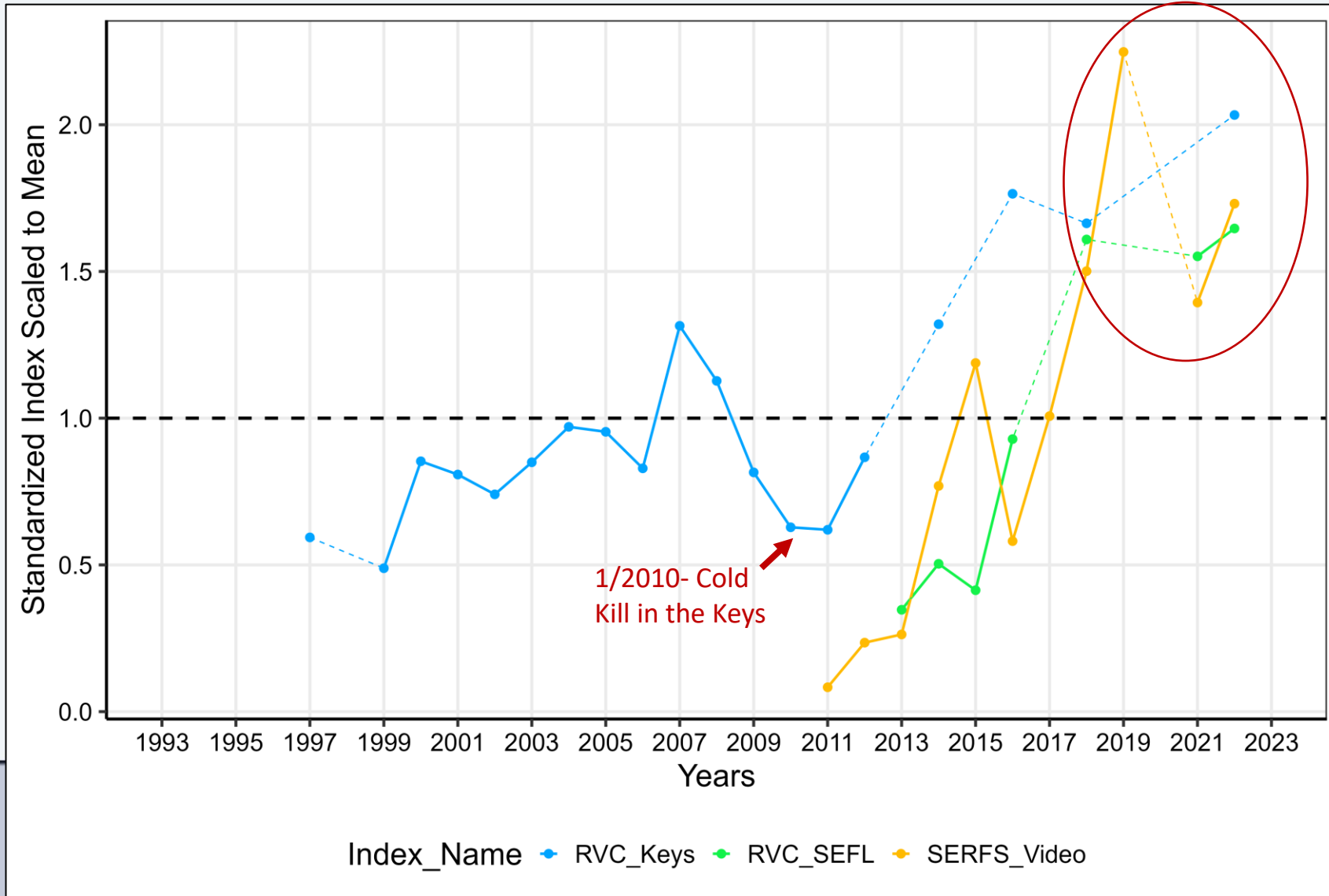
Index	FD or FI	Time Series	Num of Years	Targets	Lengths	Ages
SERFS Video	FI	2010-2022	12	Post YOY	No	No
FIM Indian River Lagoon	FI	1999-2022	24	YOY	Yes	Few
RVC SE FL	FI	1997-2023	7	Post YOY	Yes	No
RVC FL Keys			19			
RVC Dry Tortugas			12			
Combined Gulf Video	FI	1996-2022	20	Post YOY	Yes	No
Commercial Longline	FD	1993-2010	17	Adults	Yes	Yes



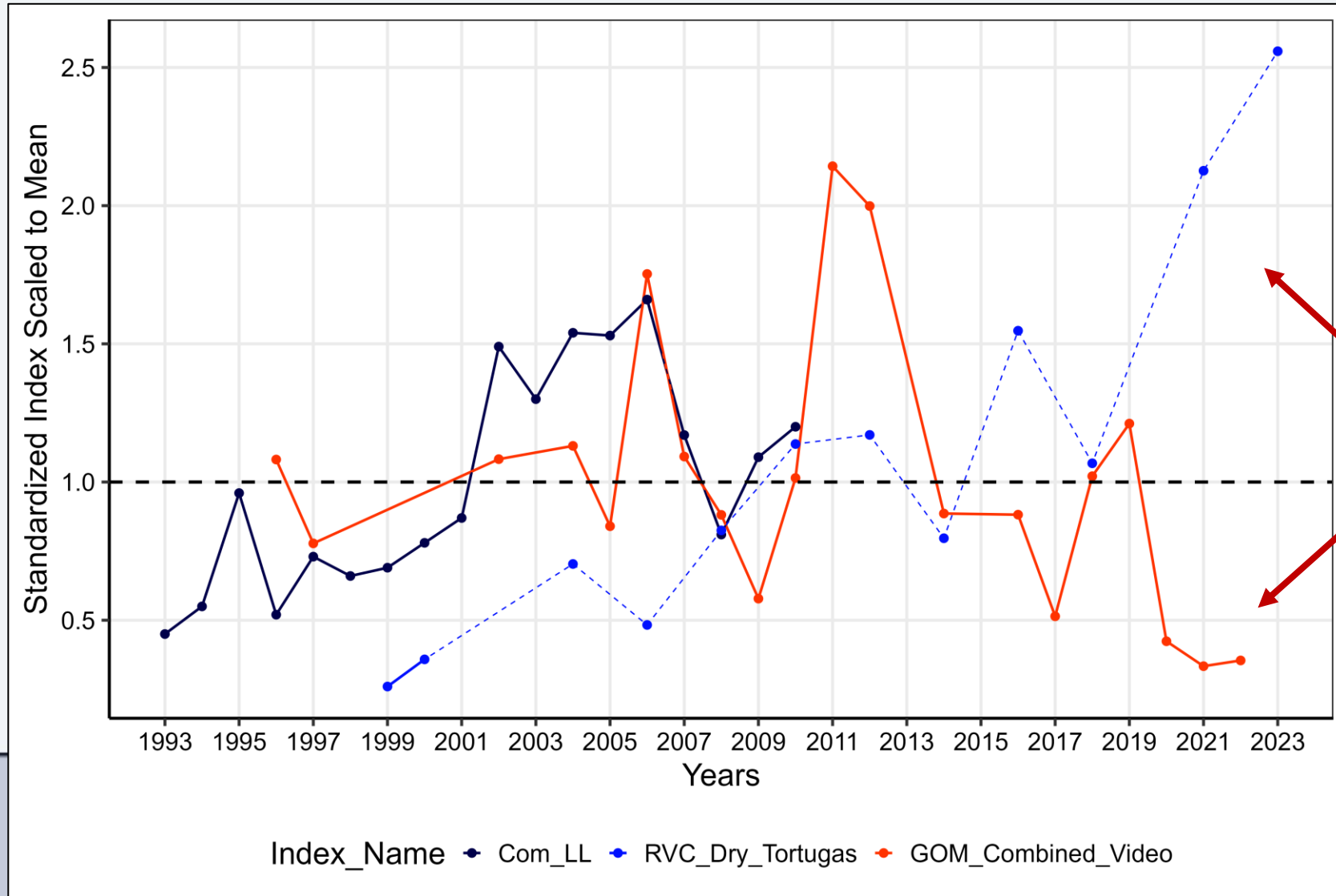
Indian River YOY Index



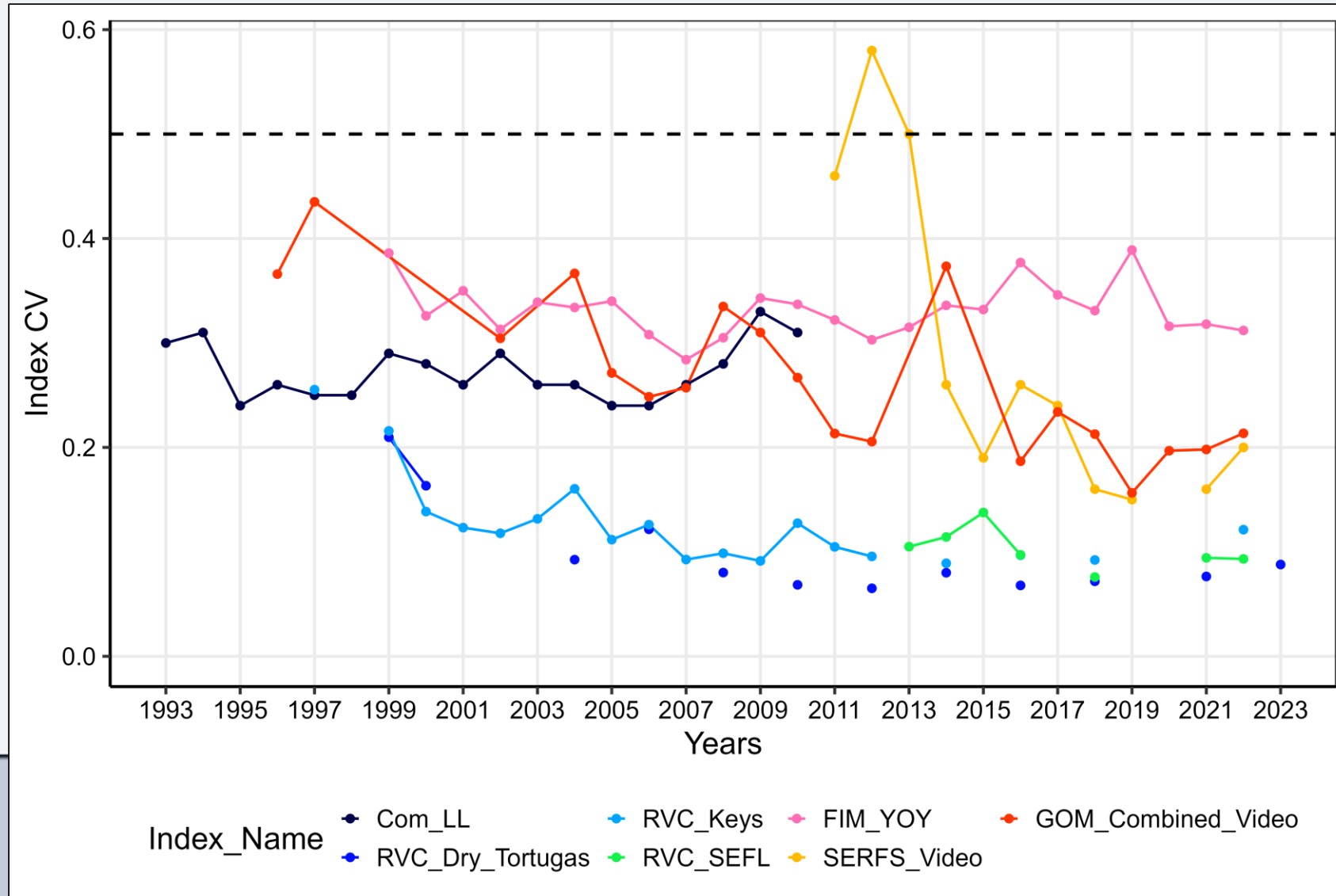
FL Keys/East Coast Post YOY Indices



GOM/Dry Tortugas Post YOY Indices



Main Data Inputs: Index CVs



Stock Synthesis Model Configuration

Stock Synthesis v. 3.30.22.1

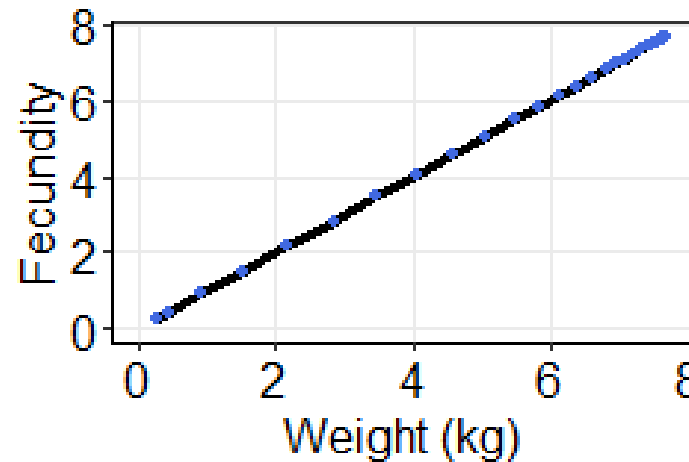
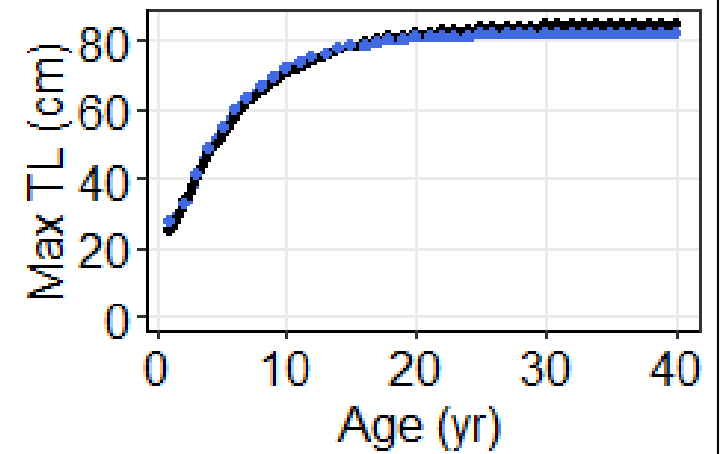
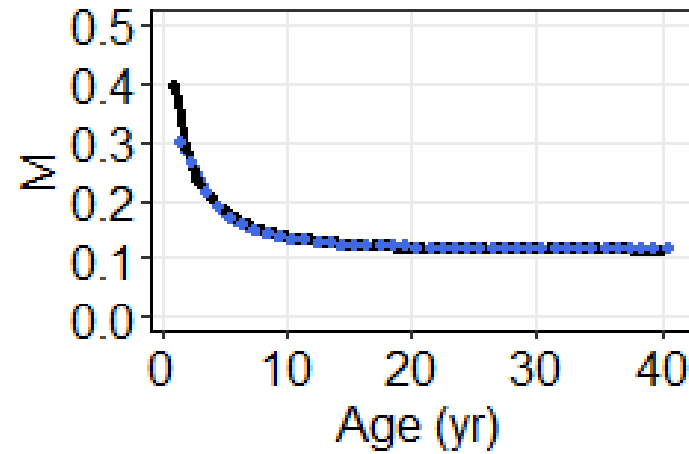
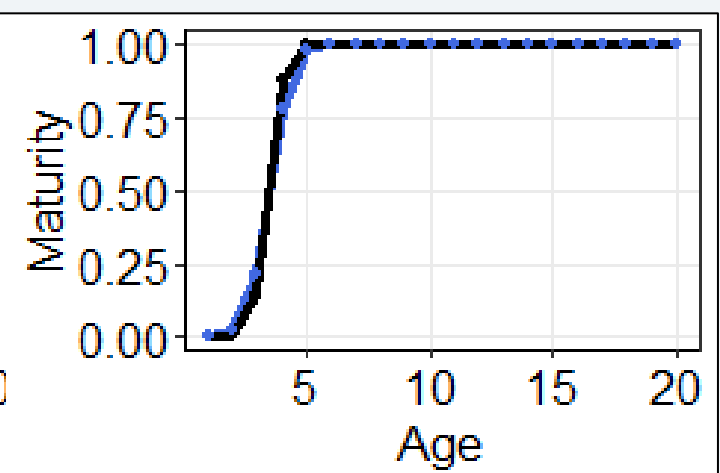
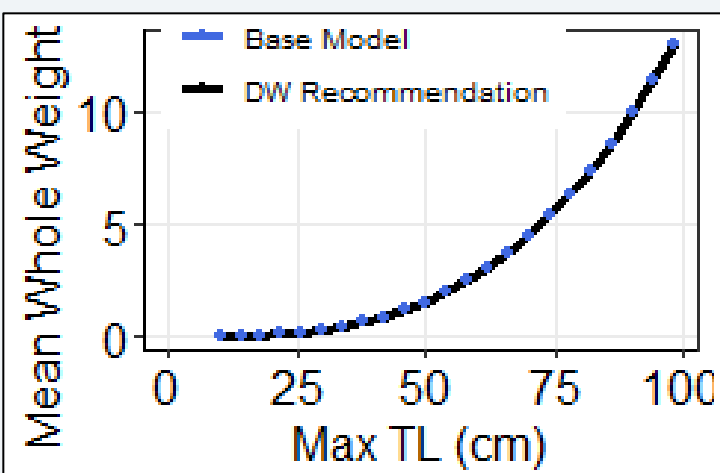
- 1 season, 1 area
- Years: 1981 - 2023
- Spawning peak: June 1
- Settlement: January at Age 1/8 cm.
- Combined sex model with female SSB
- 202 of 241 parameters estimated

Life History

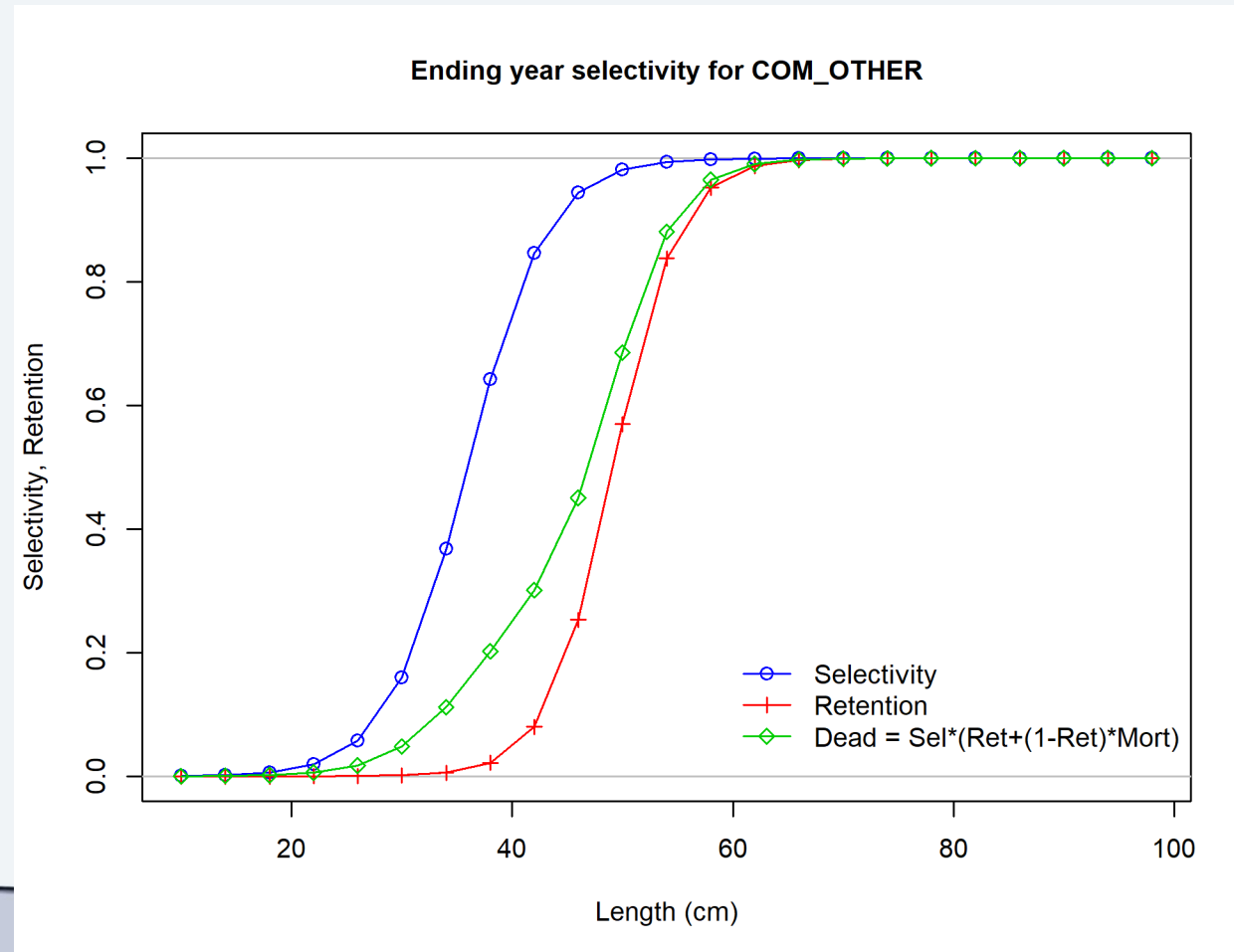
- 40 ages in the model (1-40)
- Natural mortality: Fixed Average M for ages 3-40
- Maturity: Fixed
- Fecundity = Spawning biomass at length



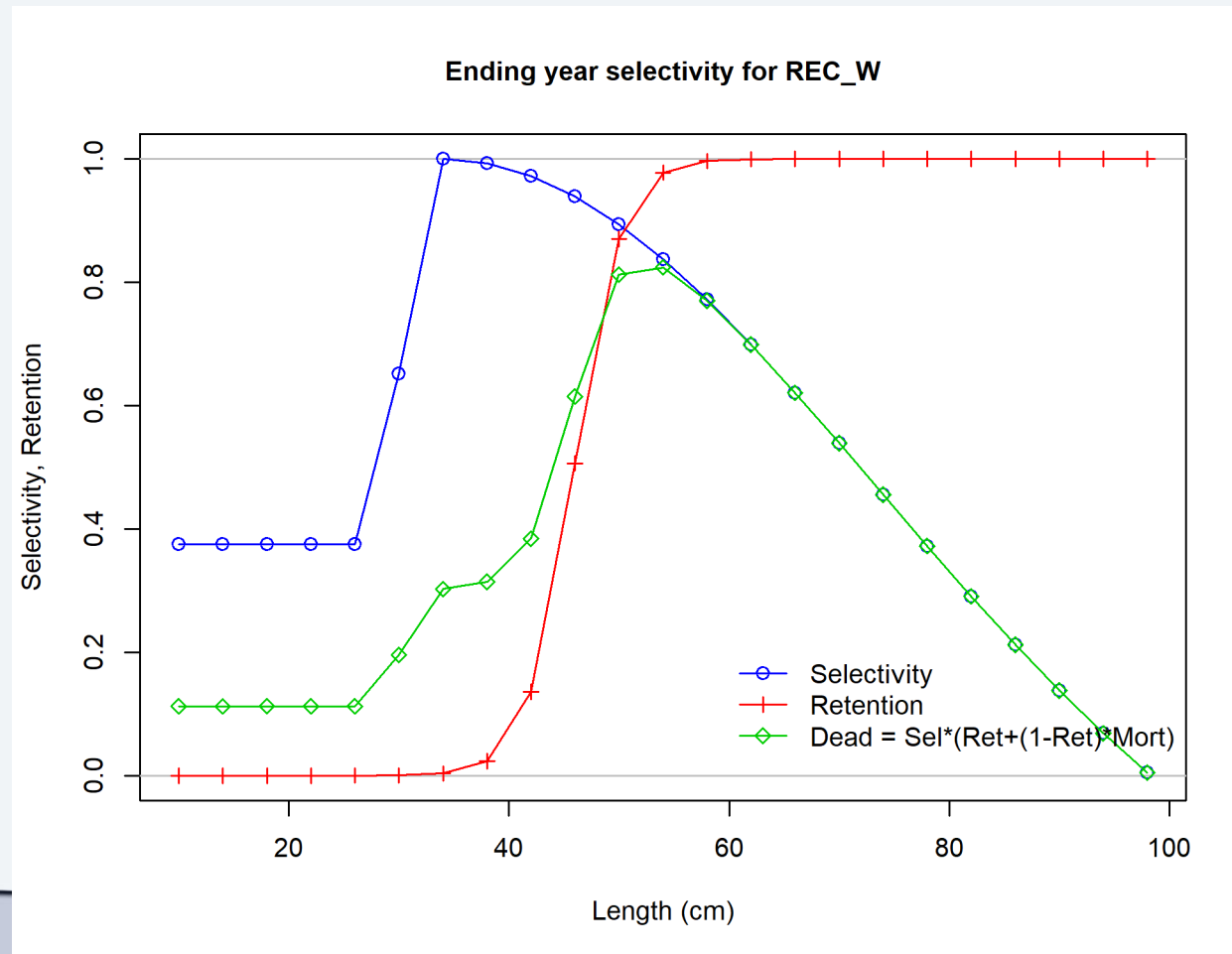
Life History



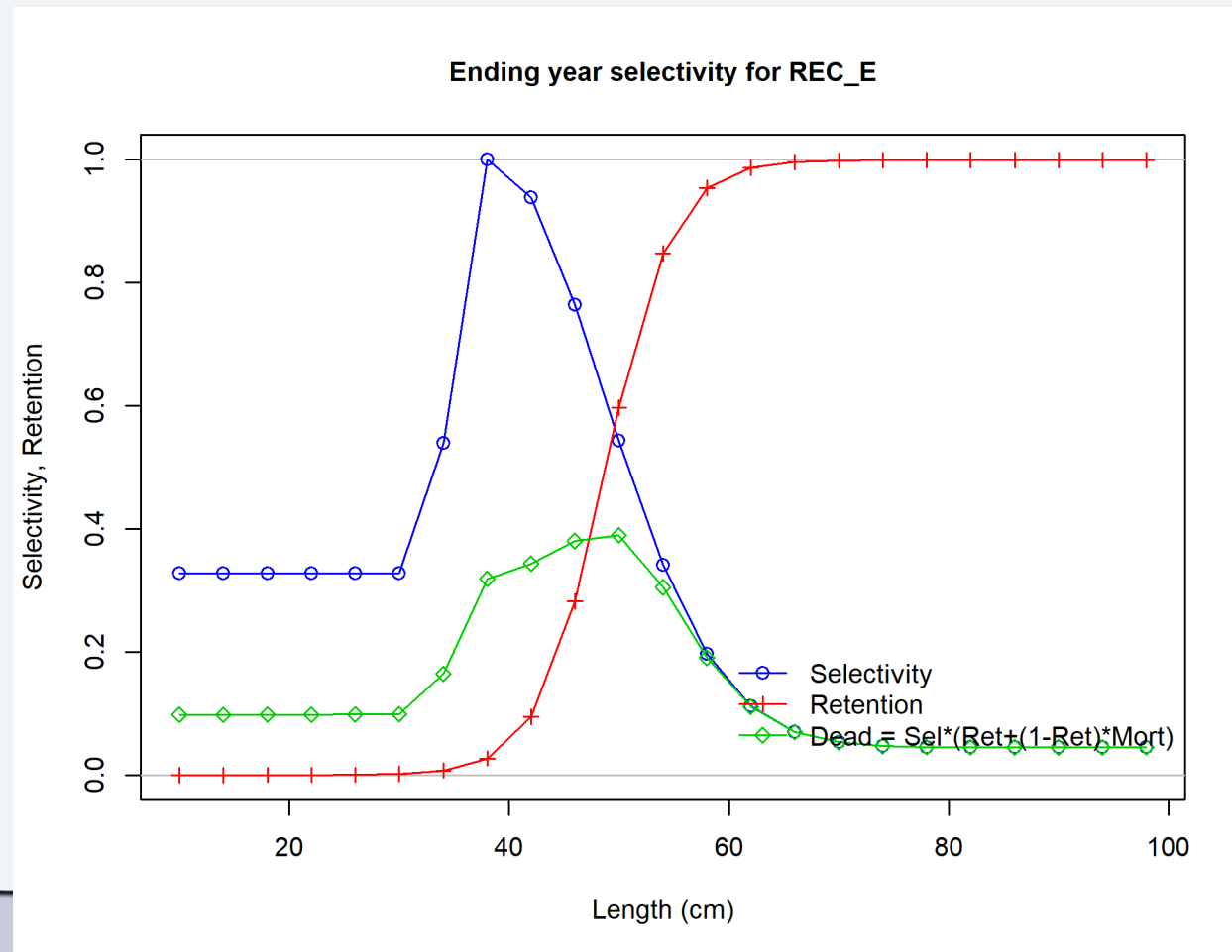
Com OTHER Retention



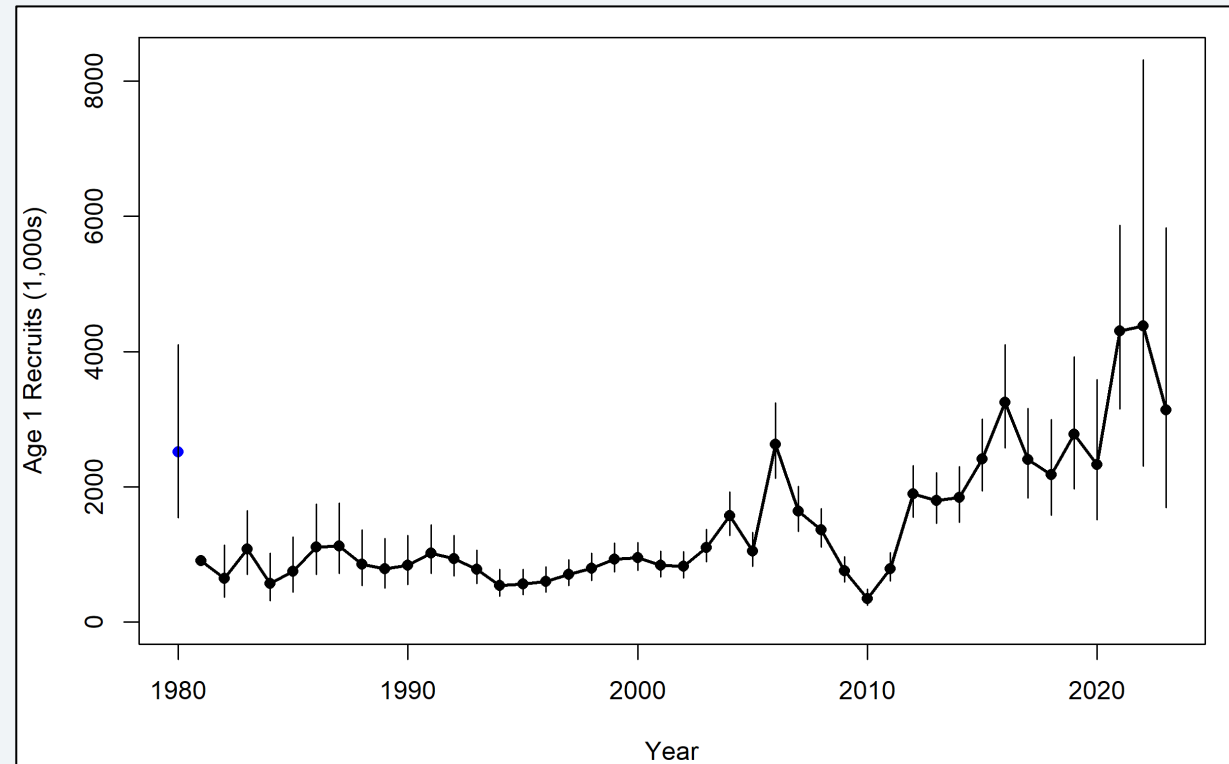
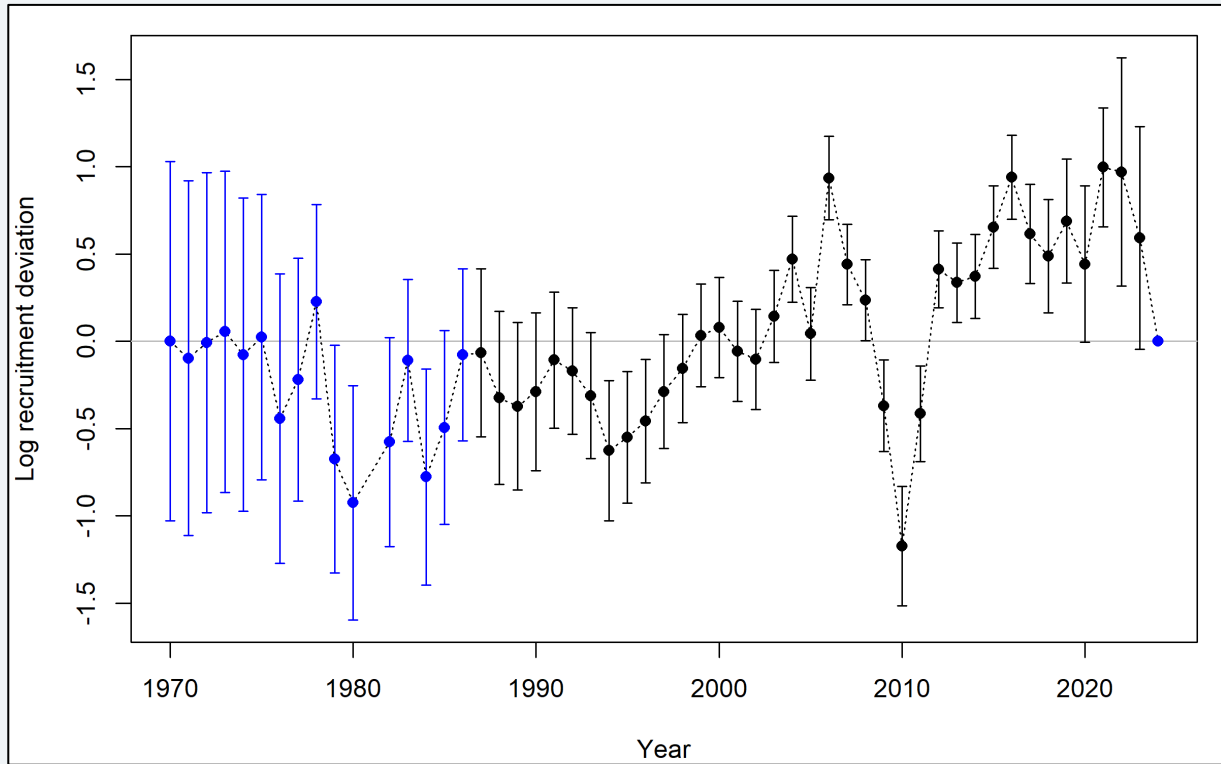
Rec WEST Retention



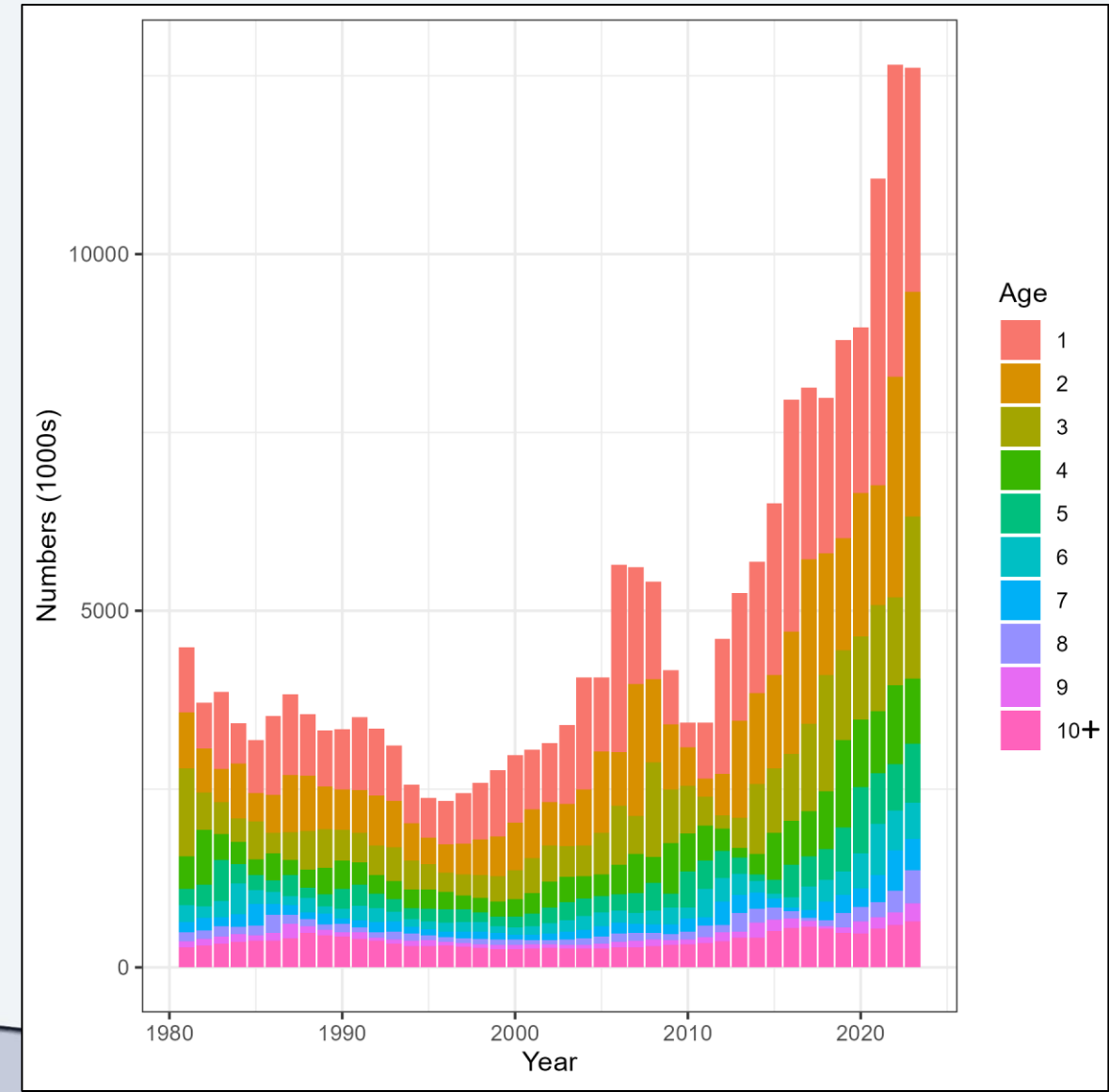
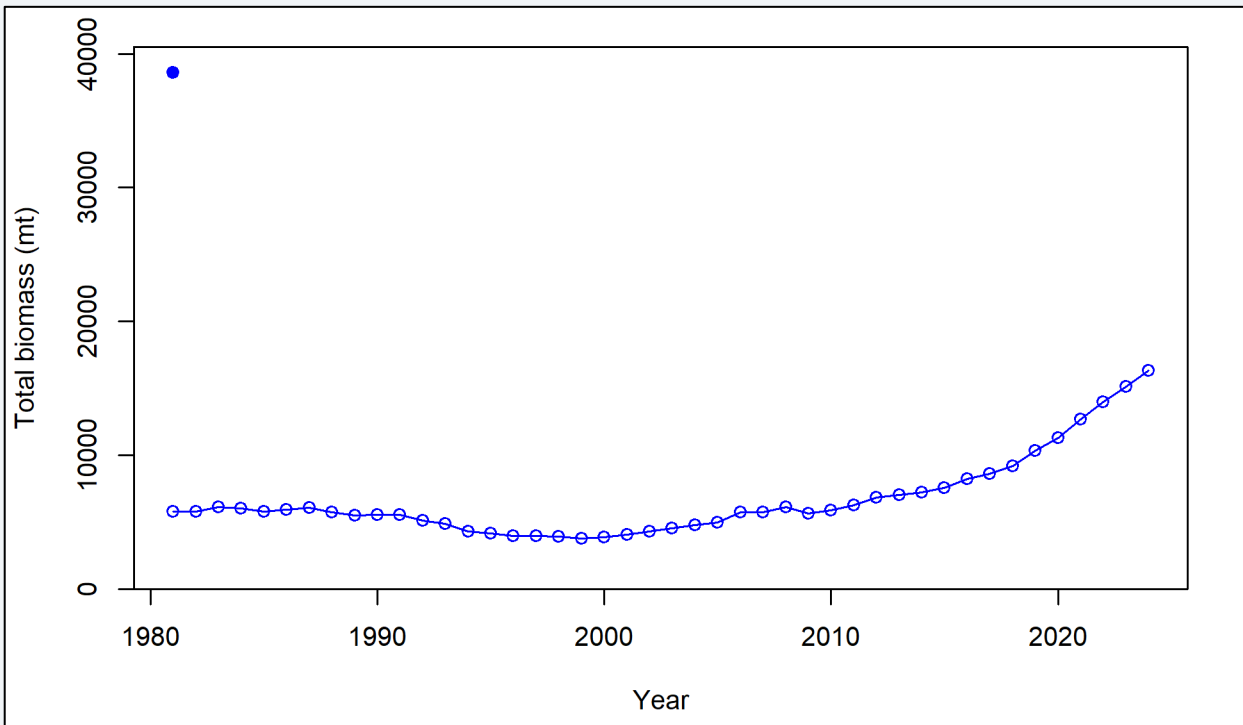
Rec EAST Retention



Age 1 Recruits



Total Biomass and Numbers at Age



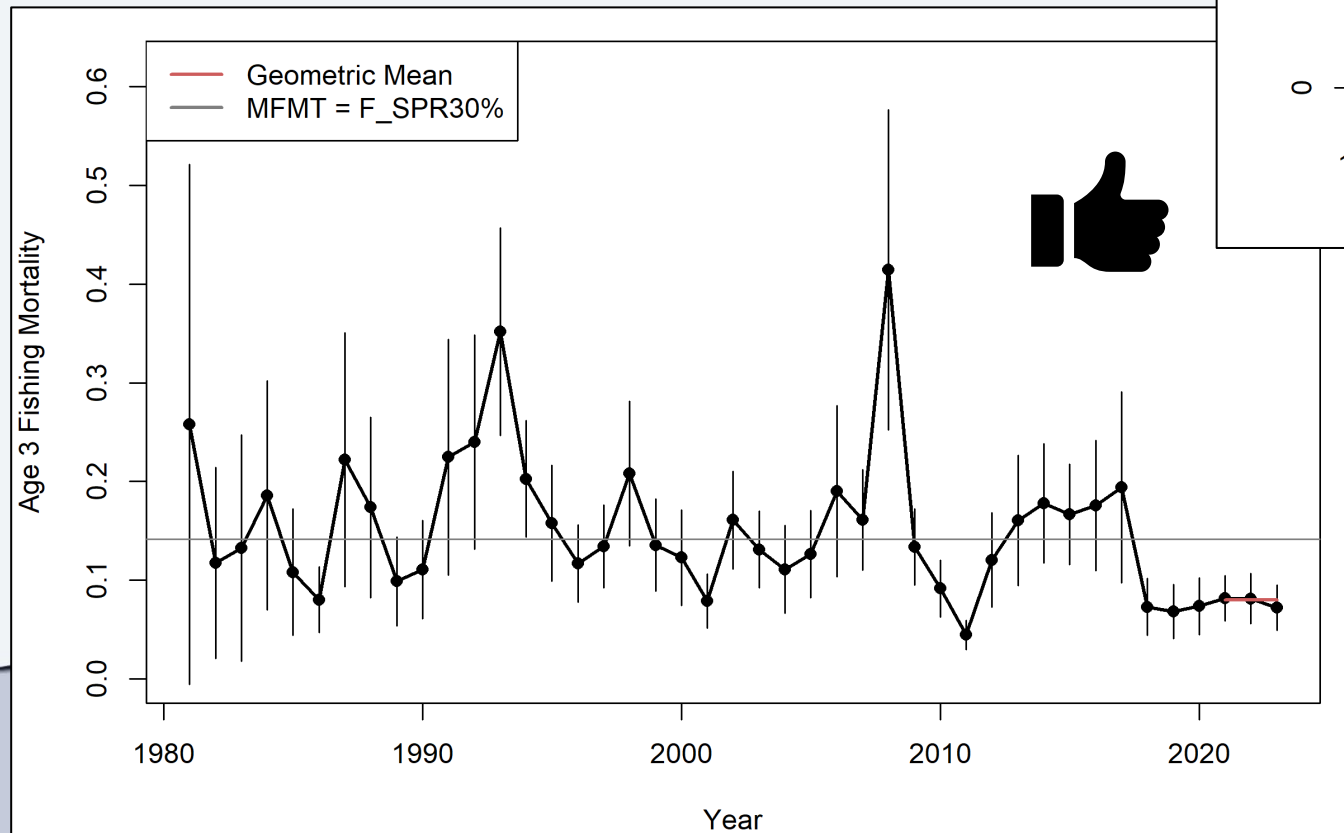
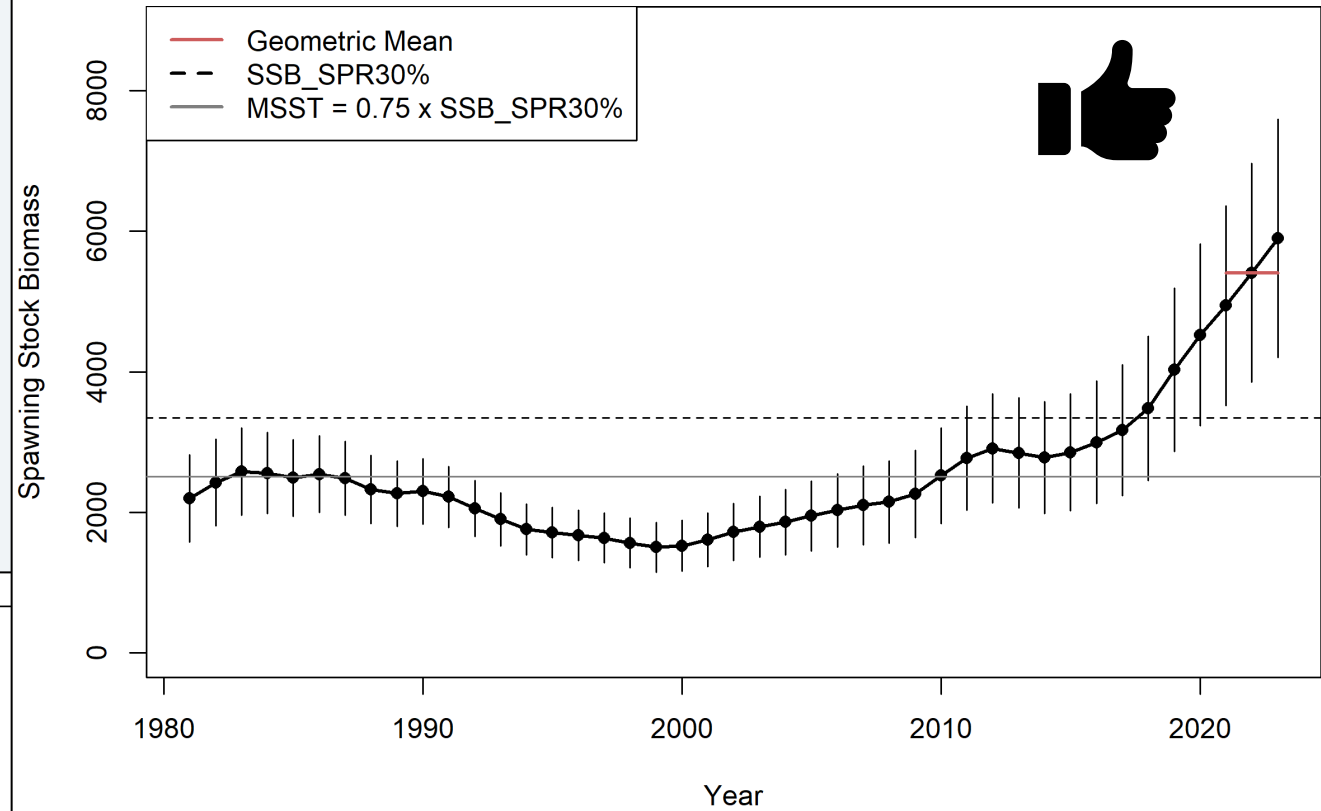
South Atlantic and Gulf of Mexico Fishery Management Councils (Amendment 41)

Criteria	Definition	Base Model Value
$F_{30\%SPR}$	The fishing mortality rate associated with 30% SPR and the proxy used for F_{MSY}	0.149 yr ⁻¹
$F_{40\%SPR}$	The fishing mortality rate associated with 40% SPR and the proxy used for F_{OY}	0.11 yr ⁻¹
MFMT (Maximum Fishing Mortality Threshold)	$F_{30\% SPR}$	0.149 yr⁻¹
F_{OY}	$F_{40\%SPR}$	0.11 yr ⁻¹
$F_{current}$ (recent average fishing mortality rate on age-3 fish)	The geometric mean of F on age-3 fish for 2021 - 2023	0.08 yr⁻¹
$SSB_{F30\%SPR}$	The estimated spawning stock biomass associated with F at 30% SPR	3,352 mt (7,389,895 lbs.)
MSST (Minimum Stock Size Threshold)	$0.75 * SSB_{F30\%SPR}$	2,514 mt (5,542,421 lbs.)
$SSB_{current}$ (recent average of SSB)	The geometric mean of SSB for 2021 - 2023	5,403 mt (11,911,576 lbs.)
MSY proxy (Maximum Sustainable Yield Proxy)	Yield at $F_{30\%SPR}$	681.87 mt (1,503,266 lbs.)



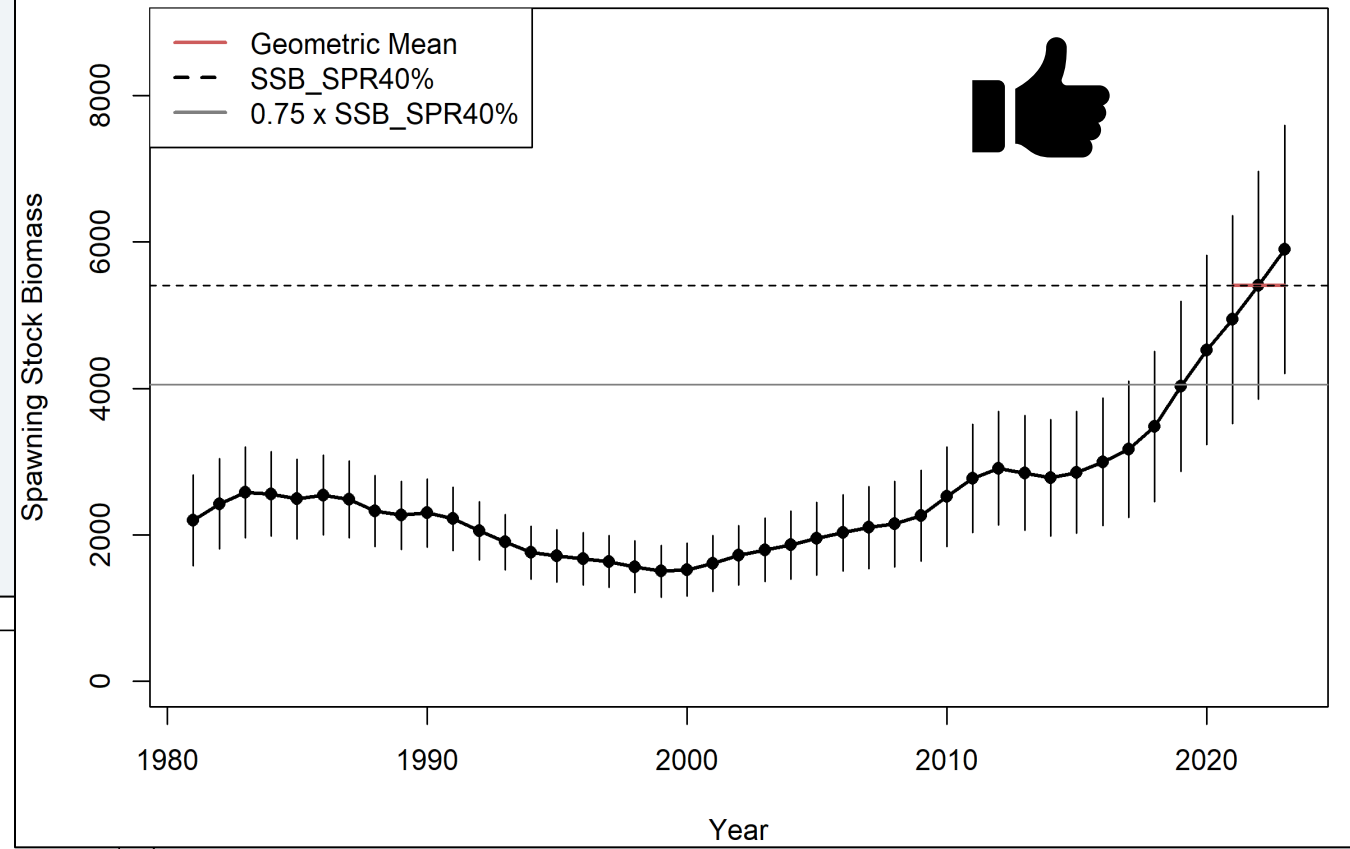
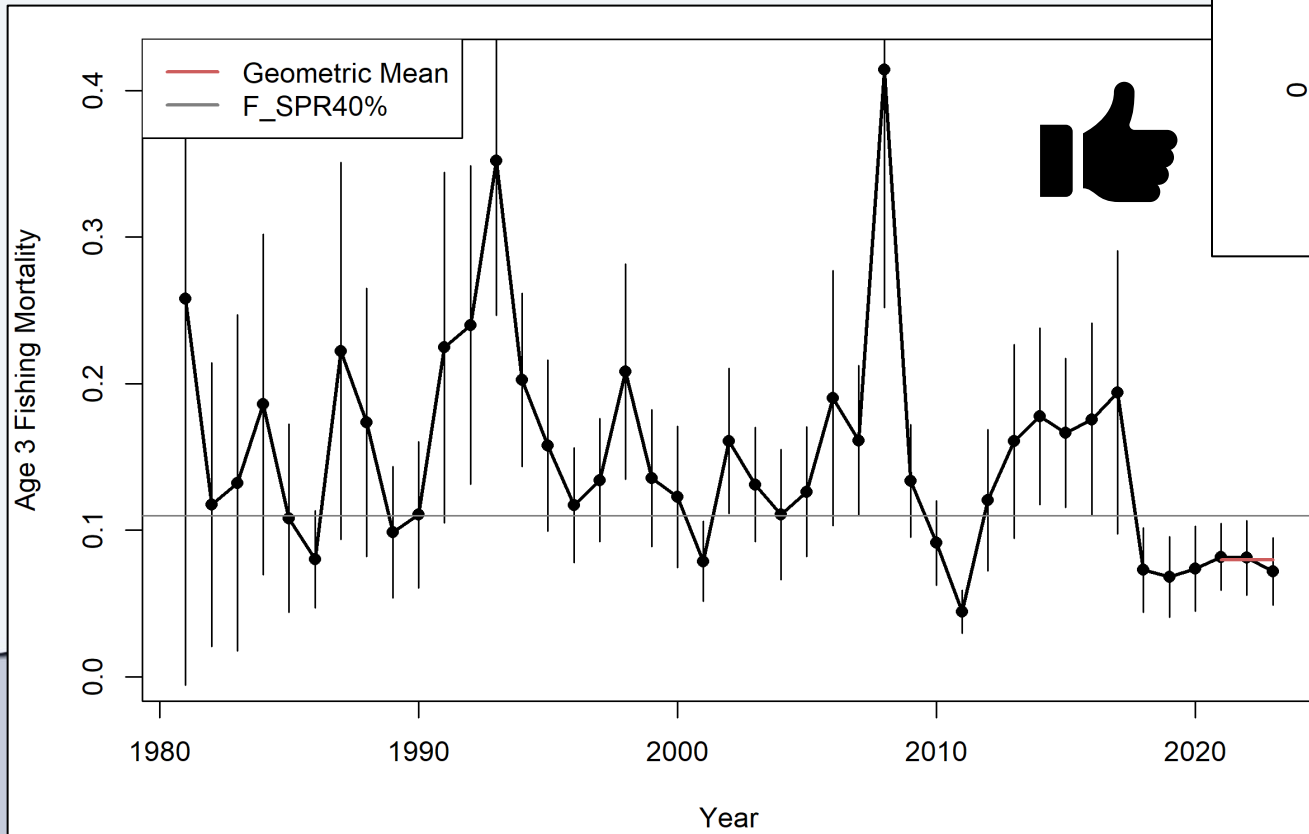
Results

MSY proxy = 30%SPR



Results

MSY proxy = 40%SPR

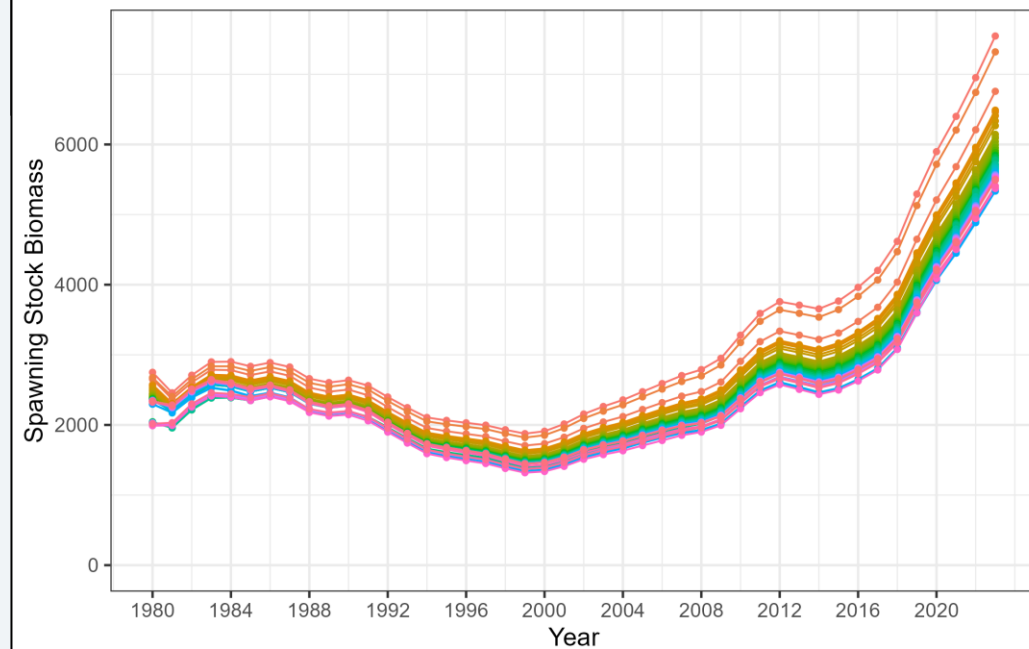
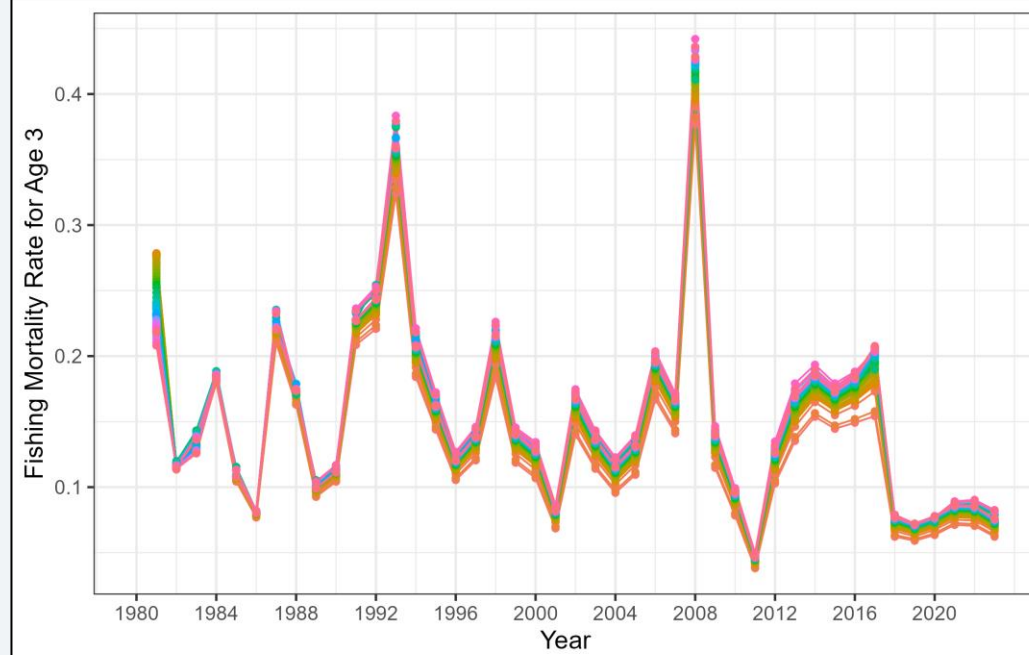
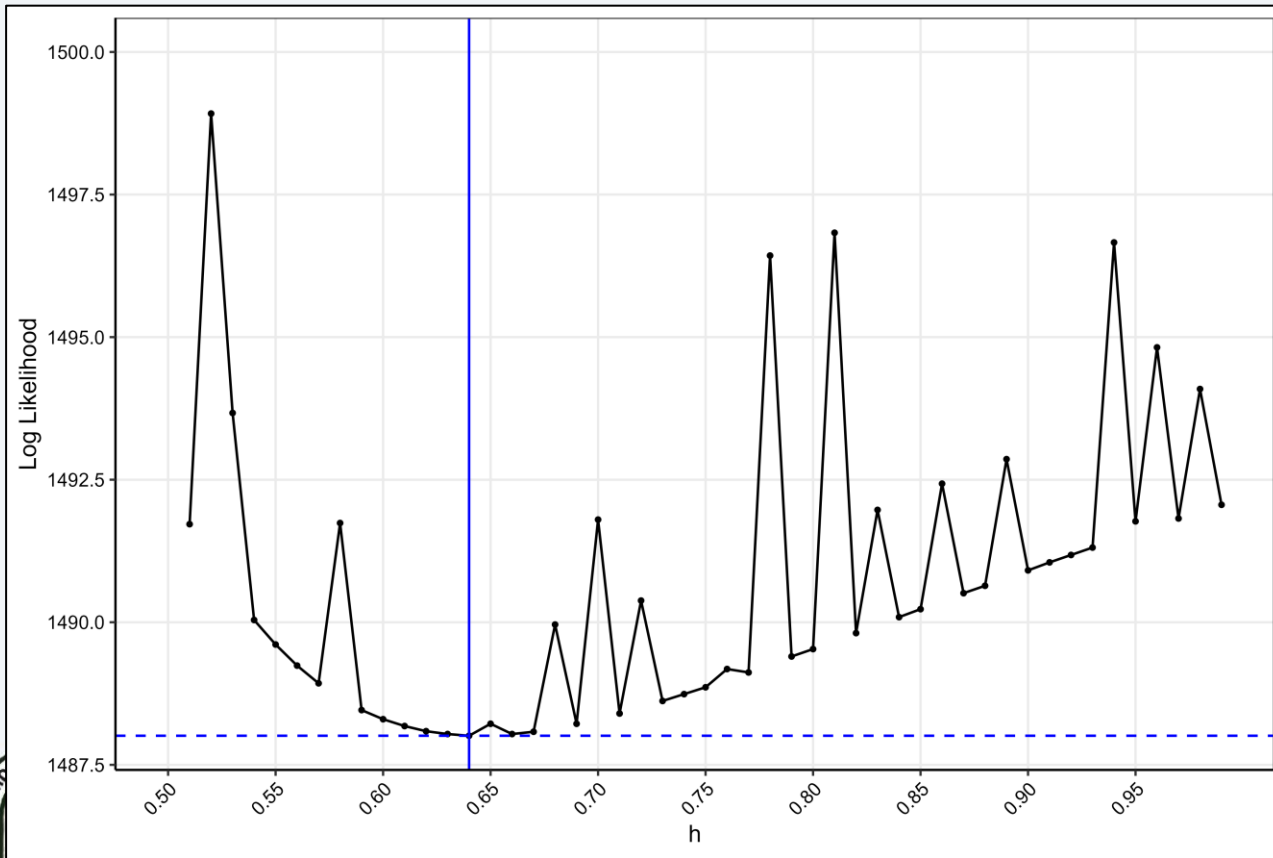


Review Panel Recommendations

- Investigate stock structure
- Further spatial investigation of indices
- Reconsider using COM Longline CPUE.
- Improve the sampling design of the recreational fishery that may under-sample large/old fish, and that could lead to overestimation of the stock size.
- Obtain release mortality rates for Mutton Snapper.
- Consider a fishing mortality rate of $F = 0.11$ as the benchmark for stock status ($\sim F_{MSY}$, $F_{40\%SPR}$, and 75% of $F_{30\%SPR}$).



Profiling on Steepness



h values

0.5	0.6	0.7	0.8	0.9
0.55	0.65	0.75	0.85	0.95



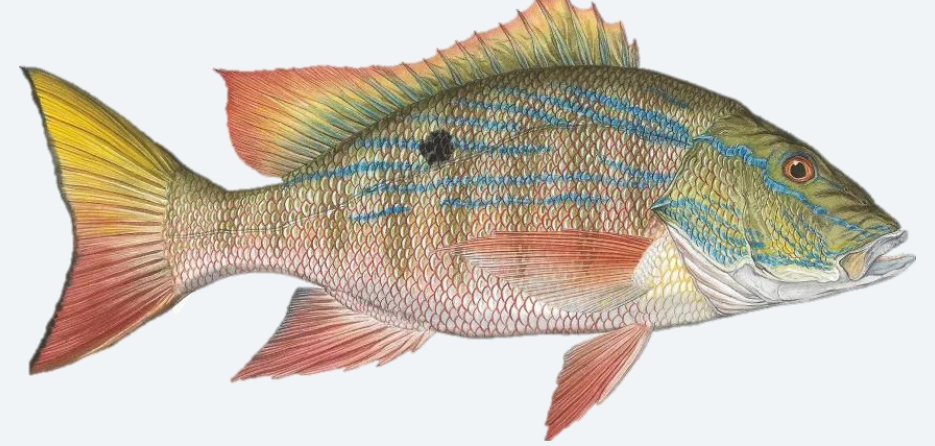
Projection Methods



- Settings:
 - Held constant for all years based on last three years in base model:
 - Target fishing mortality (or catch)
 - Fleet allocations
 - Growth
 - Stock-recruit parameters
 - Fleet selectivity and retention
 - Recruitment in 2024:
 - Recent average, or use stock-recruitment parameters as estimated by the base model.



Projection Scenarios



- Constant F scenarios In TORs (TOR 10):
 - $F_{30\%SPR}$
 - 75% of $F_{30\%SPR}$
 - $F_{40\%SPR}$ (Current definition of F_{OY}) but equal to 75% of $F_{30\%SPR}$
 - $F_{Current}$ (average of 2021-2023 estimates)



Joint SSCs Recommendations:

SSCs Consensus: The combined SSCs consider the SEDAR 79 stock assessment as consistent with BSIA. The SSCs conclude based on the SEDAR 79 results that the mutton snapper stock is not undergoing overfishing nor is it overfished. This is based on the currently adopted SPR-based FMSY proxy of $F30\%SPR$.

Joint SSCs Recommendations:

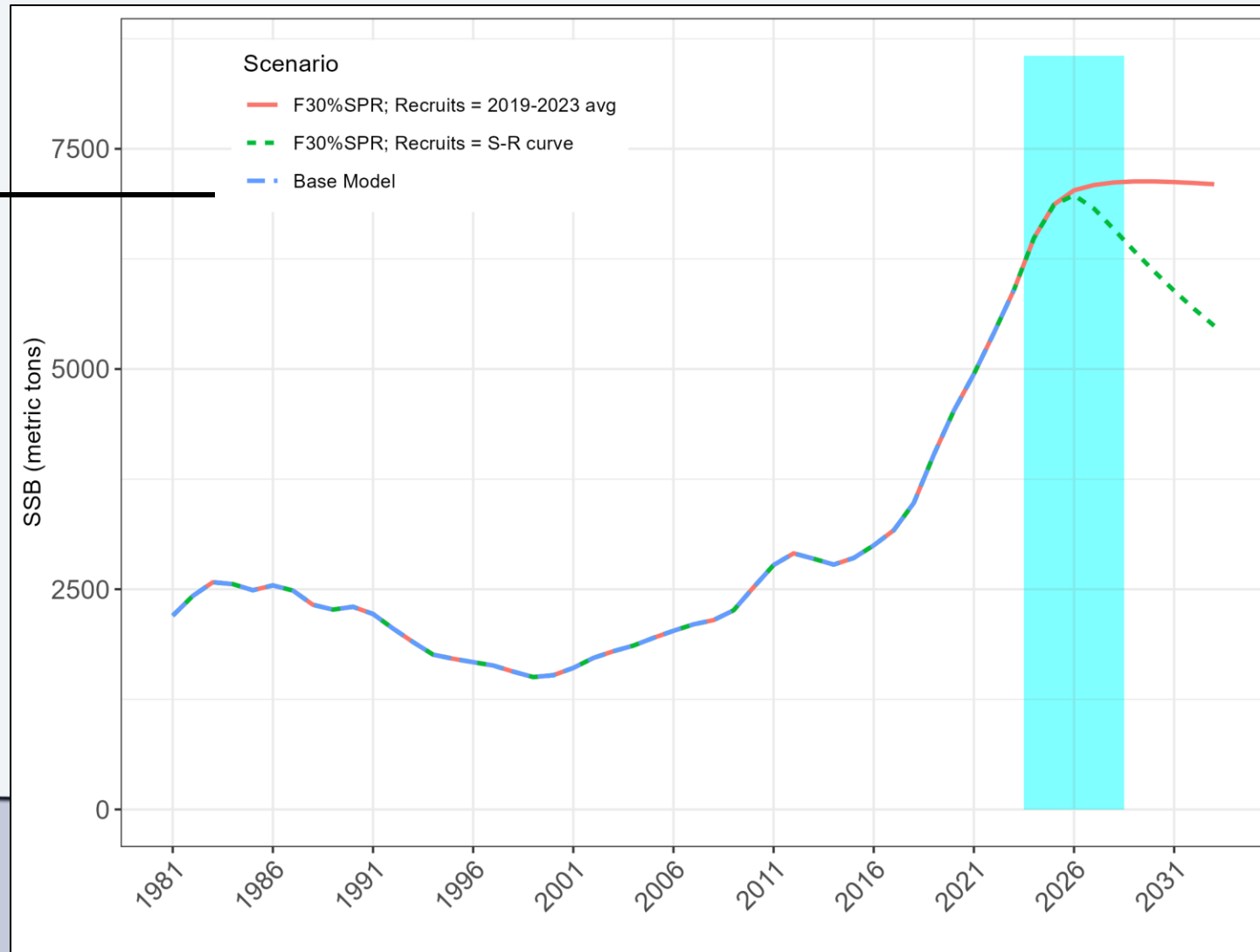
SSCs Consensus: The SSCs selected an alternative approach from the South Atlantic Council's P* approach in its ABC Control Rule for mutton snapper, because of differences in how the uncertainty in the OFL was characterized.

Joint SSCs Recommendations:

SSCs Consensus: The SSCs used the geometric mean of the most recent five years of recruitment (2019 – 2023) for informing OFL and ABC projections. Using the geometric mean for recruitment can be interpreted to indicate a regime shift; however, in this situation for mutton snapper, the SSCs do not think a regime shift has occurred. The OFL is set at F30%SPR, and the ABC is set at 75% of F30%SPR, for the years 2026 – 2028, as derived from the provided projections for 2024 – 2028.

	OFL (F30%SPR)	ABC (75% of F30%SPR)
2024	3,280,143	2,498,073
2025	3,384,760	2,662,320
2026	3,363,706	2,725,359
2027	3,313,030	2,752,377
2028	3,270,355	2,772,615

$F_{30\%SPR}$ Projection Scenario - SSB



F_{30%SPR} Projection Scenario – Retained Yield (num)

